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A Survey of Strength Training History and Evolution in Western Culture

History of Science 4420

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12/8/2010

Acknowledgements

Thanks to Professor Paul Potter and Teresa Janik for making this paper possible, to Terry and Jan Todd for their extensive body of work on the subject, and to Dr. Peter Lemon for directing me to Mr. Todd.

Introduction

In contemporary culture, weightlifting and strength training are often seen as relatively new ideas. While the fields of exercise physiology and kinesiology have only recently gained distinction from general medicine, the concepts that embody these studies are not new. Hence, the purpose of this paper is to illustrate the roots and evolution of strength training in Western culture. Individual aspects of this vast history, which spans more than two millennia, are well documented, but a complete narrative is difficult to find. This paper addresses the Greek origins, outside cultural influences, and multiple surges of popularity leading to the modern practice of strength training.

Greece

Whether the Olympic Games of ancient Greece inspired the original wave of athletic training shall remain, like the Games' origins, uncertain. However, the period following the inception of the Olympic Games in 776 B.C. (Kotynski, 2006; Kyle, 2007) is rife with training for strength. Terry Todd writes: “[Resistance training] was applied both variously and vigorously in the development of physical prowess for athletes and warfare during the classical period both in Greece and also the Roman Empire.”¹

The first Olympic event was a single foot-race (Kotynski, 2006) and may not have inspired intense training among the competitors. However, the following 22 games would find the

addition of other events, including wrestling, the pentathlon, and boxing (Kotynksi, 2006). By 648 BC the games included an event called pankration, a martial art with only, “two prohibitions in the rules that we know of – no gouging and no biting.”² It is clear that physical strength, particularly of the upper body, provided an Olympic advantage. It is also clear this fact was not lost on Greek competitors.

The pentathlon, first included in the Games in 708 BC, consisted of five events; the discus throw, jumping, the javelin throw, a foot-race, and wrestling (Kotynksi, 2006). By the fifth century B.C. the Greeks had developed at least three weighted implements for pentathlon training: a weighted discus and javelin, each thrown for distance, and the alteres or halters, hand weights used in jumping and rhythmic drills and a precursor to modern dumbbells (Todd J., 1995). Later accounts also describe plummets, large “body weights”, “[held on]...the shoulders, head, and feet...used in exercises for systematically strengthening the body.”³ Grecian training was such that one proficient Olympic wrestler, Milo of Crotona, became the subject of a story often cited as the first example of progressive resistance training (Crowther, 1977; Todd T., 1985; Todd J., 1995; Chiras, 2005; Soles, 2008).

Cited by many authors, the story of Milo of Crotona typically claims that Milo carried a young calf on his shoulders each day until the calf had fully grown. It even inspired the name of the 1900s Milo Barbell Co. (Crowther, 1977; Todd T., 1985; Todd J., 1995). The story of Milo is particularly interesting because it illustrates the modern progressive overload principle of training: for increased adaptive gains to exercise, one must progressively increase the intensity or volume of the exercise. While the accuracy of the story is unknown, tales of similar feats of strength abound in Greek literature. Stones in Olympia and Thera bear inscriptions claiming to have been lifted by ancient Greeks. One such stone weighs 143 kg, while another weighs 480 kg. Nigel Crowther (1977) argues that the absence of key details in the claims, such as height lifted

and lifting form, and the ability of modern weightlifters to deadlift over 400 kg with strictly regulated form allow for the belief that even 480 kg lifts may have been possible.

Feats of this magnitude would not be possible without progressive and heavy weightlifting. According to Crowther, the first century A.D. philosopher Epictetus' description of training contains,

...the belief that the best results are obtained from the heaviest weights; the exercise, therefore, aims at strength, as in the case of Milo [of Crotona]. A systematic approach to training is suggested, since the exercise is performed under the supervision of a trainer.⁴

Examples of this type of training exist throughout the Roman Empire as well. Gladiators trained with heavier swords to increase strength (Todd T., 1985), and athletes in Judea lifted rocks of varying weights (Crowther, 1977). In the second century A.D., the Roman physician Galen wrote *De Sanitate Tuendai*, a treatise on the health benefits of exercise. In it he detailed many implements for training and exercises to be performed. Much like Epictetus, Galen described exercises “to systematically strengthen the body”⁵ (Todd J., 1995).

While Galen approached exercise from a purely medical perspective, the philosopher Philostratus was concerned with the art of training. Writing in *Gymnasticus*, Philostratus described the body as an object of care and the athlete as a subject of logical analysis. Unlike Galen, Philostratus believed the practical work of physical trainers, *gymnastēs*, was as worthy of logical analysis as the theoretical work of Galen. Philostratus wrote, “I consider *gymnastikē* [the art of training] a form of *sophia* [wisdom], and one which is inferior to none of the other arts (*technai*).”⁶ He argued training was as much a science as medicine. In his writings he asserted numerous treatises had been written for the benefit of would-be trainers and that the actions and words of trainers needed to be carefully calculated and understood (König, 2009). Finally,

Philostratus' works also provide us with some examples of training by 'heroes' in Ancient Europe:

...some trained themselves by carrying weights which were hard to lift, some by competing for speed with horses and hares, others by straightening or bending pieces of wrought iron, while some yoked themselves with powerful, wagon-drawing oxen, and others wrestled bulls and even lions by the throat.⁷

Though the above account of training by 'heroes' may be somewhat hyperbolic, it demonstrates an awareness of the specificity principle of training. Another of the modern principles of training, the specificity principle states that adaptive gains from exercise are specific to the type of exercise performed. For example, to train for speed it is important to run, move, or lift at speeds similar to the desired end goal.

If the Olympic Games were the beginning of athletic training in Europe, the decline of Rome and rise of Christianity were the end. The decline of Rome saw both the end of the Olympic Games in the 4th or 5th century A.D.⁸ and the decline of the gladiatorial sport. However, the ends of these events were not entirely political. The Olympic Games were at heart a Pagan religious festival (Kotynski, 2006) and gladiatorial events offended Christian morals. Both ended after Christianity became the state religion of Rome. Terry Todd writes, "with the fall of the Roman Empire, the philosophy of Christian asceticism, in which the body was considered fit only for contempt and battle, achieved a prominence that was to last for a thousand years."⁹ Indeed, few accounts of exercise for training exist during the Middle Ages. As armor grew heavier, knights reportedly used weights to train for horse mounting, and though jousts were held there are no reports of athletic training for the events (Malszecki, 2010). The lack of training coincided with an absence of athletic competition. While small festivals included jousting or archery, the many disjointed medieval kingdoms and principalities prevented sporting events of

Olympic scale.

Classical Revival

Though the act of training for strength all but disappeared in Medieval Europe, the idea survived in the works of Galen. The Great Crusades reintroduced the ruling class of Europe to the classical world. Soldiers in the Middle East found libraries containing Greek and Roman literature, and brought what they found back to Europe with them (Todd T., 1966). Jan Todd writes, "...Galen's writings endured, and managed to keep alive the idea of resistance implements."¹⁰ In 1531 Sir Thomas Elyot recommended others read *De Sanitate Tuenda* and use the Greek alteres (Todd J., 1995). Other Renaissance writers wrote of resistance training, including French philosopher Rabelais, German scholar Joachim Camerarius, and British writer John Northbroke (Todd T., 1985; Todd J., 1995). Notably, Hieronymus Mercurialis wrote *De Arte Gymnastica Aput Ancientes* (Todd J., 1995).

Published in 1569, *De Arte Gymnastica* was a revival of classical thought (Todd J., 1995). Jan Todd described the book as, "Primarily a [heavily illustrated] compilation of ancient ideas on medicine and exercise ... [that] remained in print for more than a century..."¹¹ The illustrations depict highly muscular Greek men in the use of alteres, plummets, and other weights for exercise. Drawings from *De Arte* demonstrate an early European awareness of an ideal body image akin to that found in Greek art and sculpture.

Mercurialis' work was only one of two Greek influences on European exercise. Greek sculpture left impactful images of the muscular physique. Jan Todd described the impact of the *Elgin Marbles* display in 1807: "...the first classical statues to be exhibited in Great Britain.... this group of statues with their elegant, symmetrical bodies, 'excited in their admirers a spirit of agitated romanticism'"¹². Sculptures like *The Wrestlers* portrayed an exaggerated body image

drastically discordant with the state of European health at the time. The influential German educator Johann Friedrich Guts Muth gives a clear view of European regard for the classical ideal:

It is universally acknowledged, that the Greeks were eminent for beauty, and symmetry of form...though their gymnastic exercises had a particular influence on it.... Not only were they all exercised, but those more especially which most required exercise.... Thus they grew to their natural proportion; thus the muscles swelled up to a beautiful and manly firmness.... Nay they even understood the art of supplying flesh where it was wanting; fat people were rendered lean; and those who were too lean, fleshy.¹³

Greek influences are also evident in 18th century educational reform. In 1774, Johann Bernard Basedow opened a school in Germany called the Philanthropinum based on Jean Jacques Rousseau's educational ideas (Philanthropinum, 2010). The curriculum allotted 5 hours each day to exercise and activity in one form or another, including “Greek gymnastics” and “swimming, skating, marches, ladder climbing, and sand-bag carrying.”¹⁴ Basedow's literary work, *Das Ekmentarwek*, inspired a “Philanthropic Education” movement of similar schools throughout Europe (Todd J., 1992). Johann Friedrich Guts Muth, as a part of the movement, wrote *Gymnastik für die Jugend*, a book in which he strongly defends the necessity of physical training, claiming, “We are weak because it does not occur to us that we could be strong if we would,” and as, “consequences of the common method of education, and especially the neglect of bodily training.”¹⁵ Guts Muth also provides a utilitarian description of numerous exercise techniques and methods (Todd J., 1992).

Through educators like Basedow and Guts Muth it is evident that physical exercise was advocated in many parts of Europe, and heavily motivated by the classic body image. However,

the exercise most commonly recommended by them was not of the intensity needed to generate the bodies depicted in Greek art. The *Oxford English Dictionary* cites 1699 as the first usage of the term 'strong man', with the word reappearing three times throughout the 1700s (Strong man, n.d.). Though heavy lifting was not widespread, it must have been that some individuals, the 'strong men' had, like the Ancient Greeks, discovered the effects of intense strength training. But the Ancient Greeks were not the only classical tradition of strength training. The British Empire would soon bring a second culture of strength training to Europe.

Indian Clubs

The Carnatic wars of the 1700s brought an increased British presence in India (Carnatic Wars, 2010). The East India Company had been present in India since the early 1600s, but in the mid 1700s the Company rose to a position of political control in India. The Regulating Act of 1773 and India Act of 1784 established British parliamentary control of governance in India (East India Company, 2010). Jan Todd writes: "In the latter part of the eighteenth century, British military officers stationed in India were struck by the fitness and muscularity of many of the Indian soldiers and policemen."¹⁶ In his book *The Indian Club Exercise*, published in 1866, Sim Kehoe reports the reaction of one such officer:

The wonderful Club exercise is one of the most effectual kinds of athletic training, known anywhere in common use throughout India... The exercise is in great repute among the native soldiery, police, and... where great strength of muscle is desirable.¹⁷

Another officer also provides a description of the clubs and exercise entailed:

The Clubs are of wood, varying in weight according to the strengths of the person using them, and in length about two feet and a half, and some six or seven inches

in diameter at the base.... The [r]evolutions which the clubs are made to perform...are exceedingly graceful, and they vary almost without limit.... the Indian Club practice possesses the essential property of expanding the chest and exercising every muscle in the body concurrently.¹⁸

Anthropologist Joseph Alter wrote of the exercise: “Those who swing joris and gadas on a regular basis place a higher premium on the amount of weight lifted than on the sheer number of...[repetitions] swung,” with clubs weighing as much as 80 kg.¹⁹ These descriptions illuminate an Indian knowledge of overload principle and the effects of high intensity strength training.

Kehoe also tells us that, “Shortly after the establishment of English colonies in India, the Club exercise was introduced into the British Army as a part of the drill,” but, “The full exercise, however, according to the Indian practice, was not adopted, but a callisthenic exercise with light clubs was arranged...”²⁰ Though the effects of intense exercise were quite clear to the British, it would seem the idea still had not overcome cultural resistance. However, it had won over several proponents.

In 1834 Donald Walker published *British Manly Exercises: In Which Rowing and Sailing are Now First Discussed* (Todd J., 1995). Walker's text, and its eventual successor for women, presents a number of sports and athletic activity suitable for the upper class, including Indian club exercises; both the light weight routines of the British army and more vigorous club work. Walker's books did not inspire a movement of heavy exercise, but their mainstream introduction of club exercise likely inspired a man known as 'Professor Harrison' (Todd J., 1995).

Professor Harrison, an English man, became a proponent of heavy club exercise after having taken up the activity systematically for several years (Todd J., 1995). Jan Todd quotes an 1852 article in *The Illustrated London Times*:

The clubs with which Mr. Harrison commenced [three years ago] weighed about

seven pounds each; he has advanced progressively, until he can now wield with perfect ease two clubs, each weighing 37 pounds, and his heaviest weighs 47 pounds.... At the same time his shoulders have increased immensely, and the muscles of his loins...are now largely developed and powerful. In short, all the muscles of the trunk have been much improved by this exercise.²¹

Sim Kehoe also wrote of Harrison during Kehoe's visit to Europe:

On the occasion of seeing Prof. Harrison, of London—a well-known English Professor of Gymnastics—use the mammoth war-clubs, [I] thought there must be something in it, and determined upon introducing it into the United States upon [my] return home. Prof. Harrison was then considered the strongest man in England, and the Queen was so pleased with his extraordinary skill in the use of these Clubs, that she presented him with an elegant Vase.²²

Indeed, Professor Harrison, who also authored a book on training; *Indian Clubs, Dumb-bells and Sword Exercises* (Todd J., 1995), was well known in England for his strength and physique. He was the sole inspiration for Kehoe's *The Indian Club Exercises*, already mentioned, and for Kehoe's business manufacturing Indian Clubs in America (Kehoe, 1866; Todd J., 1995). Kehoe's role introducing Indian Clubs to America ultimately spawned a short-lived movement of club exercise akin to the callisthenic routines originally adopted by the British Army (Alter, 2004).

Prior to his trip to Europe, Kehoe, as a purveyor of gymnastics equipment in the United States, was a part of a burgeoning very different exercise movement now called German gymnastics.

Pre-1900 America

While Indian clubs found popularity in England, the Indian tradition of intense weight

training was not widely adopted in English culture. While the British were struck by the physique of heavy club swingers, Euro-Christian culture did not accept Indian training habits without reducing them to a form already prevalent in European society (Alter, 2004).²³

Following the influence of Guts Muth's Philanthropic movement, Germany experienced a unique physical culture movement rooted in German nationalism. The German nationalist movement was a result of Napoleonic rule of German states in the early 1800s, and Friedrich Ludwig Jahn, inspired by Guts Muth, saw athletics as a tool for political change (Giessing & Todd 2005). Jahn began a movement labeled 'German Gymnastics' by historians, but he purposefully avoided the word gymnastics, electing to use the German word Turnen instead (Giessing & Todd 2005). Distinctly German, Turnen held an influential role in defining German nationalism and masculinity. The movement was so effective that at one point it was banned as a form of radical politics. German athletics were irrevocably altered by Jahn and remained distinct from the remainder of Europe until the intellectual revolutions of the 20th century.²⁴ However, Turnen did spread to the young United States.

Resistance training existed relatively early in American history. Benjamin Franklin wrote in a letter in 1786 of his good health: "I live temperately, drink no wine, and use daily the exercise of the dumb-bell".²⁵ He also expressed favor towards more vigorous exercise for a shorter period of time (Todd J., 1995; Windship, 1862). In 1824 Turnen found its way to the United States via Karl Follen and Karl Beck, students of Jahn in Germany (Marburg-Cappel, 1976). Beck established his own outdoor gymnasium in Northampton, Massachusetts, and was noticed by two physical educators: Joseph Cogswell and George Bancroft. The pair had opened a school in the Philanthropic style the year before Beck's arrival, and Beck joined them by instructing gymnastics. The partnership was short-lived, as the school closed in 1832. However, during his time in Northampton, Beck translated one of Jahn's books on Turnen into English

(Marburg-Cappel, 1976). Notably, Beck's translation included a forward in which he expressed his view that gymnastics was a field worthy of scholarly attention and should be subject to, “impartial and thorough investigation.”²⁶ Beck also wrote, “Gymnasticks are an art, and theory and practice should never be separated.”²⁷ This line in particular is interesting because it resonates Philostratus' view of the ancient *gymnastikē*, though it seems unlikely Beck could have known of his predecessor.

Prior to the Northampton school closing, Harvard University took note of Beck. Members of the Harvard faculty had generated interest in a Physical Education department, and Beck was their chief candidate to pioneer the new department (Marburg-Cappel, 1976). However, Harvard was unable to recruit Beck, and attempted instead to hire Jahn himself from Berlin. When Jahn's requested salary was too great for the University, Harvard turned to Follen as an immediate solution (Marburg-Cappel, 1976; Giessing & Todd 2005).²⁸ This marked the first introduction of gymnastics, and possibly the first form of athletics, to an American college.²⁹

Perhaps it is appropriate then that the voice of the first progressive heavy lifting movement since the Ancient World would arise from Harvard University and equally as ironic he would not find his inspiration in the German gymnastics movement. By his own account, George Barker Windship was one of the two smallest students in the Harvard class of '54 (Windship, 1862). In his *Autobiographical Sketches of a Strength-Seeker*, Windship's description of his time at Harvard bears an almost humorous uncanniness to modern children's stories. While at Harvard he became the subject of teasing from an upper year bully. Windship was 5 ft tall and 100 lbs, and only aged 17 when he entered Harvard (Todd J., 1993). Unable to retaliate due to his small stature he became highly motivated to increase in size and strength with the ultimate goal of confronting his persecutor two years later. Windship attended the gymnasium at Harvard daily and systematically. By his own account, the result of his training, along with natural growth, was

that his, “shoulders had broadened, and my muscles been developed, so as to present to the critical and interested observer a somewhat threatening appearance.”³⁰ Further, he claimed his training left him feeling more energetic and his mental constitution less susceptible to ailments such as headaches and nervousness. His former bully forgotten, Windship continued to train and by his own account became known as the strongest man in his class (Windship, 1862). But, his now inflated ego would soon be severely bruised. He recounts the event:

While at Rochester, as I was passing through the principal street, I met a crowd assembled about a lifting-machine. On making trial of it, I found I could lift four hundred and twenty pounds. I had then been for four years a gymnast, and I supposed my practice would have qualified me to make the crowd stare at my achievement. But the result was far from triumphant. I found what many other gymnasts will find, that main strength, by which I mean the strength of the truckman and the porter, cannot be acquired in the ordinary exercises of the gymnasium.³¹

Windship was severely embarrassed that, despite all his training, he could not impress the crowd. Following the incident, Windship continued on at Harvard, studying medicine and building an intense scientific interest in strength building. He set about building his own lifting apparatus, determined to build his “main strength.”³²

Using Greek statuary as his desired outcome, Windship approached his training with an analytical inclination. His time in dissection at Harvard allowed him to test the integrity of human bones, reassuring him that, “...if properly positioned, [they] would safely bear a strain of two or three thousand pounds.”³³ When Windship was challenged by a doubter to pick the man up, lift the man above his head, and throw the man over a fence, Windship took to practicing with a box, “to be sure of the muscles that would be brought into play by the feat.”³⁵ According

to Windship, he successfully completed the “experiment” by throwing the man, though the challenger “objected very decidedly to its repetition.”³⁴

On May 30, 1859, Windship gave his first lecture on the subject of weightlifting to a crowded music hall. Though he fainted from stage-fright, he would successfully deliver his lecture in June, the first of many across the United States (Windship, 1862; Todd J., 1993). These lectures, all of which culminated in a demonstration of strength, advocated Windship's motto of “Strength is Health” (Windship, 1862; Todd J., 1993). Windship believed that progressive strength training built resistance against illness in addition to building muscle mass (Todd J., 1993).

Windship's lectures, reputation, and physical stature inspired an epidemic of exercise in the United States. However, as Jan Todd explains, the movement became focused on one exercise:

Though Windship continued to preach that the entire body needed to be trained with resistance exercise, most of the entrepreneurs who followed on his coat-tails fixed their efforts on the heavy partial lift which became known, generically, as the Health Lift.³⁶

Todd also provides an account of the ensuing popularity of the Health Lift:

Lifting machines aimed at home and institutional use were rushed onto the market in the 1860s, and found instant popularity. In major cities, a number of Health Lift studios or gyms opened, catering to busy office workers who were promised a total workout in only minutes per day.³⁷

By 1870, studios had been created across the States in New York, Boston, Chicago, and Cincinnati, including low-rate options for the general populace (Todd J., 1993). These studios complemented already present gymnasiums inspired by the smaller German Gymnastics movement.

The success of the Health Lift was a product of several key specifics: the message of Windship's strength and health was a potent one; Windship himself was an exercise maven, actively seeking to spread his expertise; and, the entrepreneurs he attracted were both salesmen and vehicles for massive propagation. These combined factors pushed the idea of intense, progressive, and systematic strength training over a tipping point and into an epidemic across the major population centers of America.

However, when Windship died suddenly in 1876, at age 42, the Health Lift died with him, leaving behind only a remnant of lifting enthusiasts (Todd J., 1993). Not only did his death deprive the movement of its only authoritative source of knowledge, the premature nature of his death undermined the very message of the Health Lift. Opponents of the Lift arose and drew the obvious, but flawed, conclusion that Windship's death proved strength was not health. The studios closed, but American society had already been permanently changed.

Through Windship's movement the American population had been exposed to exercise, and though after his death most ceased training for strength, many continued exercising, moving on to the new fads of aerobic exercise, the growing interest in American sport, and lighter training (Todd J., 1993). However, the results of strength training, widely known in modernity, are indisputable, and a comparatively small, but significant, number of individuals were now aware of those results. Using traditional dumbbells and the new barbells to set new records³⁸, and using photography and magazines to communicate, the new lifting enthusiasts formed a subculture that persisted, preserving the idea of progressive resistance training through its own dark age.

The Musclebound Myth

Throughout the centuries, the benefits of strength training served as the foundation for multiple cultural movements. The Ancient Greeks trained for advantage in competition, the

Roman's for war, the British saw the results in the Indian people, and Windship was his own proof. However, 19th and 18th century opponents to training had complaints that also could have been based observations, specifically on the results of poor training methods.

Criticism of Windship's Health Lift had been voiced as early as 1879 (Todd T., 1985). William Blakie, in his book *How to Get Strong and How to Stay Strong*, which advocated primarily lighter training, complained that the Health Lift produced a, “stiffening of the back,” and, “abnormal development,” of specific muscle groups.⁴⁴ It is entirely possible that Blakie had experienced these side effects. Heavy weight lifting can incur an immediate muscular stiffening, or delayed soreness and tightness during recovery, and adherence to a single lift alone can generate a muscular imbalance around the joints involved. Other accusations that intense strength training made a man slower do have some grounding in real phenomena. Training adaptations are speed specific to a degree, and increased body mass is detrimental to performance in sports where the body is propelled through space, particularly jumping and distance running. Individuals who trained at slow speeds yet gained large amounts of body mass may not have seen a commensurate increase in performance. This observation could have lead some to conclude lifting was detrimental to performance. However, it seems more likely that the opposition to lifting was cultural in origin.

How to Get Strong was an influential book, and in his argument against the Health Lift, Blakie evokes the image of a workhorse, large and strong but slow, in analogy to a highly muscular person (Todd T., 1985). This 'intuitive' or common-sense thinking that largeness correlated with slowness, albeit wrong, was easy to accept in a society familiar with large work animals such as horses. Strongman Arthur Saxon wrote: “...it has been said that by developing one's strength...a man will transform into a species of clumsy elephant...”⁴⁰

Following Windship's death, the anti-training message was an opportunity for

entrepreneurs, just as Windship's pro-training message had been. At the time the market for exercise equipment was based on mail-order distribution. Heavy weights were expensive to ship, and thus less profitable than lighter equipment. Weightlifters turned businessmen lied, claiming their personal physique was a product of lightweight training, and endorsed their own lightweight products such as elastic chest expanders (Todd T., 1985). Sometimes they would sell books on training which involved no weight at all, merely tensing isolated muscles. In doing so, these salesmen made polarized claims that heavy weightlifting should be avoided, "as you would the devil," or, "as one would the plague."⁴¹

The negative image of weightlifting, ironically created by salesmen lifters, had a tremendous affect on the academic world. Collegiate athletics in America had developed throughout the 1800s, with organized team sport seeing its advent in the 1870s (Lewis, 1970). However, cultural stereotyping blinded the athletic world to the advantages of weightlifting. Collegiate athletes and coaches accepted the standing wisdom of the musclebound, or slow and inflexible, lifter. Training for sport was entirely scrimmaging and running (Todd T., 1985). This sentiment extended into professional sports as well. Bibb Falk, a major league baseball player in the early 1900s, described training in the major leagues as running, throwing, and playing, and said: "The key to baseball is power and power comes from speed and we were leery of anything that might slow us up."⁴²

The myth of musclebound lifters penetrated even into the academic world. Physical educator Dr. Tait McKenzie published a photo of a muscular man with the caption: "Extreme muscular development without corresponding increase in heart and lung power. This man could not float in sea water and died prematurely."⁴³ A physical education student at Ohio State took a survey of 45 physiologists on their definition of 'musclebound'. While only 7 attempted to define the term, none disputed the condition or its link to heavy exercise (Todd T., 1985). In 1940

respected professor Peter Karpovich was known for his lectures against “muscle builders” (Todd & Todd, 2005), and in the early 1950s, Dick Landis, the future collegiate strength coach at Princeton, was removed from his high school varsity basketball team when his coach discovered he used weights (Landis, 1983). Such was the taboo on weightlifting in the early to mid 1900s.

The American University Revolution

The source of the musclebound myth betrays the presence of a persisting culture of lifters after the Health Lift. The men who made such bold claims against lifting had themselves arisen from a small subculture of weightlifters. However, not all weightlifters decried their sport for profit. Though they would go mainly unheard for 40 years, charismatic figures like Bernarr MacFadden and Bob Hoffman, were highly outspoken about the benefits of strength training (Todd J., 1991; Todd T., 1993a). In 1899, MacFadden released the first issue of his magazine *Physical Culture*, which would become controversial for its use of photography to display the semi-nude physique (Todd J., 1991). Bob Hoffman, founder of the York Barbell Co., followed MacFadden's example, publishing *Strength & Health* in 1932 (Hoffman, 1932). Hoffman's rhetoric, in particular, would eventually pierce the stigma surrounding strength training in the academic world.

But before Hoffman would make an impact at Springfield College in 1940, it is worth noting that American colleges were not entirely devoid of strength training. A few exceptions did exist. The gymnasiums opened in the 1800s, such as that at Harvard University, still existed. While the majority did not include strength training, Louisiana State University had, “some activity in weight training...as early as the 1930s.”⁴⁴ Thanks to physical educator Roy McLean, the University of Texas held possibly the first ever weightlifting class for credit in 1919 (Todd T., 1993b). Elsewhere, Fraysher Ferguson, a student at Springfield College, formed a weightlifting

club between 1938 and 1940, and in 1940 invited Hoffman to the College to give an open demonstration of the benefits of weightlifting (Todd T., 1994).

At that time Dr. Peter Karpovich was a respected physiologist and outspoken opponent of strength training at Springfield College, once saying, “One of the great tasks that faces Springfield College is to fight these muscle builders.”⁴⁵ Hoffman's demonstration of the physical feats that could be accomplished with weightlifting was destined to end in conflict with Karpovich. Indeed, when Hoffman asked the audience for questions, Karpovich, thinking it impossible, defiantly asked one of the highly muscular demonstrators to, “scratch his back between his shoulder blades.”⁴⁶ Humorously, the lifter replied, “But my back doesn't itch,”⁴⁷ and the group of lifters proceeded to scratch their backs, perform full splits, and, to show agility, perform a standing backflip while holding 50-pound dumbbells (Todd & Todd, 2005). Embarrassed, but more importantly convinced, Karpovich was now interested in methodically studying the effects of strength training.

In 1951 *Research Quarterly* published a controlled study by Karpovich and William Zorbas, a master's student, which found 300 lifters to be faster than 300 non-lifters. Karpovich also conducted a survey of 31,702 weightlifters, finding the reported incidence of injury to be only 1.5%, and corroborating the survey with personal interviews of 75 lifters. He studied the intelligence, rate of injury, speed, flexibility, and athleticism of weightlifters. In 1948, he co-authored the textbook *Physiology of Muscular Activity*, the primary text for teaching physiology of the time. In 1956, with *Strength & Health* editor Jim Murray, Karpovich co-authored the influential book *Weight Training for Athletics* (Todd & Todd, 2005; Murray, 1997).

Karpovich was not alone in challenging the scientific basis of the musclebound myth. Charles McCoy, Professor of Physical Education at the University of Iowa, inspired two of his students through his own personal results with weightlifting in the 1940s (Todd T., 1991). Both

students conducted dissertation research similar to Karpovich's, with Edward Chui's research actually reaching publication in *Research Quarterly* before Karpovich, in 1950 (Todd T., 1991; Todd T., 1992). Further studies supporting the conclusions of Chui and Karpovich were published in 1952 and 1953 (Todd T., 1992).

The myth of musclebound lifters was also being attacked on the athletic front. Mentioned previously, Roy McClean, at the University of Texas, was ahead of his time, teaching a weightlifting class and coaching the wrestling and cross country teams with weightlifting as early as the 1920s (Todd T., 1993b). McClean was even able to inspire the swimming coach at Texas to involve some early strength training, despite the coach's negative beliefs toward heavy training. However, Alvin Roy would be the one to pave the way for strength training in athletics programs, and he would do so at Louisiana State University.

While serving with the US Military, Roy experienced the results of strength training as an aide for the US weightlifting team during the 1946 World Championships in Paris (Todd T., 1992). Again, Bob Hoffman, coach of the team, managed to inspire another advocate of lifting. After returning to Louisiana, Roy attempted to introduce lifting to local schools. In 1954, he convinced his former high school to allow him to implement a weight training regimen for the ailing football team. The next season, Istrouma High went undefeated (Todd T., 1992). In 1957 Roy went to LSU to rejuvenate their football team with the first ever off-season strength training in college football. The LSU Tigers were undefeated in the 1958 season (Todd T., 1992). Later, Roy moved on to be the first professional trainer with the San Diego Chargers. The Chargers' record in 1962 was 4-10; in 1963 they were the AFL⁴⁸ champions (Todd T., 1992).

LSU's success did not go unnoticed. Colleges across America began to hire strength coaches. In 1962 Princeton University hired Dick Landis as a strength coach (Landis, 1983). Though the athletic coaching staff did not believe in lifting when he arrived, he quietly built a

school gym, and lifting became popular among students, faculty, and players. By 1970 Landis' program was thriving, and multiple sports at Princeton implemented strength training (Landis, 1983). Similarly, 1969 saw Boyd Epley become the strength coach for the University of Nebraska football team as a direct result of LSU's success (Epley, 2009). These schools were not isolated cases, by 1961 at least 16 colleges across America held competitive weightlifting events, offered credit for weightlifting courses, or included weightlifting in training for varsity sports; and by 1965 at least 5 more colleges did as well (Todd T., 1994).

In the midst of the collegiate training revolution arose a new avenue of scientific study. Richard Berger, another convert of Bob Hoffman, conducted a study at the University of Illinois on the effects of differing training methods on improvements in strength (Todd & Todd, 2001). Also published in *Research Quarterly* in 1962, the study varied the number of sets and repetitions of lifters. Berger's work was not attempting to validate the effects of weightlifting. Instead, he assumed lifting was beneficial and sought to optimize the practice of lifting. By the 1970s weightlifting was inherent in college athletics, and Hoffman had achieved his goal of dispelling stereotypes by influencing a few important collegiate educators.

Conclusion: Philostratus Realized

The collegiate training revolution molded contemporary culture. The trends that emerged in the 20th century have continued to grow in modern society. Higher education now includes the new fields of kinesiology, exercise physiology, exercise nutrition, sport psychology, and physical therapy; all of which would have once been a part of medicine. Entire journals, such as the *Journal of Exercise Physiology* and the *Journal of Sport Science and Medicine*, exist for the study of exercise. Athletic competition is more influential than ever before. Nations make elaborate bids for the opportunity to host the next World Cup or Olympics, and professional sport

is an industry of mammoth proportions. To be competitive at these levels, all athletes must undertake rigorous strength training. Children that dream of the glory or success of an athlete must also aspire to train like one, and improving athletic performance is often the primary goal of scientific study.

With all this growth, the revival of the Olympic Games is highly appropriate in an allegorical sense. Modern training is reminiscent of Ancient practices. Not only are we now, like the Greeks once were, motivated by competition, but modern trainers are polymaths, in essence Philostratus' *gymnastēs*. Training today is both art and science. Trainers are expected to understand the mechanics of the human body and to apply them both systematically and in a manner unique to each individual's strengths and needs. To Philostratus the practice of training was as worthy of study as the theory, and that sentiment is well represented today. Boyd Epley eventually founded the National Strength and Conditioning Association (NSCA), which today regulates and offers education and certification for strength coaches and personal trainers as well as publishing an academic journal (NSCA timeline, n.d.). The NSCA is not the only organization dedicated to the study and education of training practice. Other similar associations of professionals and many universities offer courses for the study of coaching and training. Though the end of an ancient civilization buried Philostratus' vision for strength training, modern civilization has renewed and realized Philostratus' *gymnastikē*: art and science of training merged.

Endnotes

¹ Todd, T. (1985), p37.

² Kotynski, E. (2006), p7.

³ Todd, J. (1995), p4.

⁴ Quoted in Crowther, N. B. (1977), p116.

⁵ Todd, J. (1995), p4.

⁶ As translated in König, J. (2009), p260.

⁷ As translated in König, J. (2009), p269.

⁸ Uncertainty of the exact date the Olympic Games ended is discussed in Kotynski, E. (2006), p3.

⁹ Todd, T. (1985), p37.

¹⁰ Todd, J. (1995), p5.

¹¹ Todd, J. (1995), p5.

¹² Quoted from Jenkyns, R. (1980). *The Victorians and Ancient Greece*. Cambridge, MA: Harvard University Press, p11; in Todd, J. (1992), p6.

¹³ Quoted from [Guts Muth] Salzmänn, C. G. (1802). *Gymnastics for youth or a practical guide to healthful and amusing exercises for the use of schools. An essay toward the necessary improvement of education as it relates to the body*. Philadelphia, PA: printed by William Duane, p167-168; in Todd, J. (1992), p7. The work referenced is an English version of one of Guts Muth's books, mistakenly attributed to Salzmänn when reprinted.

¹⁴ Todd, J. (1992), p7.

¹⁵ Quoted from [Guts Muth] Salzmänn, C. G. (1802). *Gymnastics for youth or a practical guide to healthful and amusing exercises for the use of schools. An essay toward the necessary improvement of education as it relates to the body*. Philadelphia, PA: printed by William Duane, p167-168; in Todd, J. (1992), p7.

¹⁶ Todd, J. (1995), p8.

¹⁷ Quoted in Kehoe, S. D. (1866), p7.

¹⁸ Quoted in Kehoe, S. D. (1866), p7.

¹⁹ Quoted from Alter, J. (1992). *The Wrestler's body: Identity and ideology in North India*.

Berkeley, CA: University of California Press, p64; in Todd, J. (1995), p8.

²⁰ Kehoe, S. D. (1866), p7.

²¹ Quoted from *The Illustrated London News*. August 14, 1852 in Todd, J. (1995), p9.

²² Kehoe, S. D. (1866), p8.

²³ See Alter, J. S. (2004) for an analysis of Indian and Christian masculinities of the period.

²⁴ See Giessing, J., & Todd, J. (2005) for a detailed history of Turnen and training in Germany.

²⁵ Franklin to Le Veillard, 22 April 1786. Quoted in Van Doren, C. (1938). *Benjamin Franklin*

New York, NY: The Viking Press, p 743; and in Todd, J. (1995), p7.

²⁶ Quoted in Marburg-Cappel, E. G. (1976), p240.

²⁷ Quoted in Marburg-Cappel, E. G. (1976), p240.

²⁸ Correspondence between Harvard staff is well documented in Marburg-Cappel, E. G. (1976), p240-252.

²⁹ Lewis, G. (1970), p223 cites the Harvard gym along with 7 other gymnasiums as the first occurrence of collegiate athletics.

³⁰ Windship, G. B. (1862), p3.

³¹ Windship, G. B. (1862), p5.

³² Windship, G. B. (1862), p5.

³³ Windship, G. B. (1862), p6.

³⁴ Windship, G. B. (1862), p7.

³⁵ Windship, G. B. (1862), p7.

³⁶Todd, J. (1993), p8.

³⁷Todd, J. (1993), p8.

³⁸See Todd, J. (1995), p9-13 for the evolution of barbells.

³⁹Quoted in Todd, T. (1985), p38.

⁴⁰Quoted in Todd, T. (1985), p38.

⁴¹Quoted in Todd, T. (1985), p39.

⁴²Quoted in Todd, T. (1985), p40.

⁴³Described and quoted in Todd, T. (1985), p41.

⁴⁴Blakie, W. (1879), p99; and quoted in Todd, T. (1994), p13

⁴⁵Quoted in Todd, J., & Todd. T. (2005), p4.

⁴⁶Quoted in Todd, J., & Todd. T. (2005), p6.

⁴⁷Quoted in Todd, J., & Todd. T. (2005), p6.

⁴⁸The AFL was still an independent league, not yet merged with the NFL.

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