

Symposium: Nutrition and Physical Performance: A Century of Progress and Tribute to the Modern Olympic Movement

From Olympia to Atlanta: A Cultural-Historical Perspective on Diet and Athletic Training¹

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ABSTRACT Greek and Roman writers described diet and training of Olympic athletes. Lucian (A.D. 120–ca. 180) described distance and speed work in runners; Galen (A.D. 131–201) recommended ball-related exercises to train vision and the body; Philostratos (A.D. 170–249) suggested cross training by endurance running, weight training, and wrestling with animals. The ancient Greek training system, the tetrad (*ἡ τετρας*), was a four-day cycle with each day devoted to a different activity. Diogenes Laertius (died A.D. 222) wrote that Greek athletes trained on dried figs, moist cheese and wheat; then the pattern changed and focused on meat. Epictetus (2nd century A.D.) wrote that Olympic victors avoided desserts and cold water and took wine sparingly. Philostratos deprecated athletic diet in his era, a pattern based on white bread sprinkled with poppy seeds, fish and pork. Americans at the XIth Olympiad in Berlin (1936) consumed beefsteak with average daily intake of 125 grams of butter or cotton oil, three eggs, custard for dessert and 1.5 L of milk. The American pattern at Berlin was characterized by ad libitum intake of white bread, dinner rolls, fresh vegetables and salads. At Atlanta, more than 5 million meals will be served during the Olympic festival. The highly varied menu will include fresh vegetables and dips; fruits, cheeses and breads; salads; pasta, rice and fruit salads; soups; meat and seafood entrees; hot vegetables; desserts; and beverages. American Southern specialties will be served. *J. Nutr.* 127: 860S–868S, 1997

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The first Olympiad in antiquity was held in the year 776 B.C. At this celebration there was a single event, the *stadion* or footrace. The victor was Koroibos of Elis. The race was one *stade*, a measurement of approximately 200 yards; the distance at Olympia was 192.27 m. Eleven hundred years after Koroibos' victory, the 287th and last Olympiad before the modern revival was celebrated in the year 393 A.D. Olympic victor lists were compiled in the early 3rd century A.D. by Sextus Julius Africanus (A.D. 160–240). The names of only two champions from the last Olympic games of the ancient era are known: Philoumenos, a wrestler, from Philadelphia (Amman, Jordan), and Barasdates, a boxer, who represented the Kingdom of Armenia (Africanus).

MODERN OLYMPIC REVIVAL, ATHENS, 1896

In this centennial year we remember the past, acknowledge the present, and commemorate the modern Olympic movement, an idea brought to fruition 100 years ago by the Frenchman Pierre Baron de Coubertin.³ Athens, Greece, was the

venue of the first games of the modern Olympic revival; 311 athletes participated and 13 nations were represented (Benson and Robinson 1993). The American contingent was a curious ad hoc group. Once the team was identified and announced, the American press deprecated the athletes, stating that members of the Princeton track team led by Robert Garrett had little to offer. Garrett would win two gold medals in Athens, one in the shot-put, the second in the discus. James B. Connolly represented the Suffolk Athletic Club of Boston and participated in the triple jump, the first event on the Olympic schedule in Athens. He was victorious and became the first gold medalist of the modern Olympic era (Mandell 1976). Contrast the Athenian Games with those held in Barcelona during summer of 1992, where 10,563 athletes participated and 172 nations were represented (Benson and Robinson 1993). Consider, too, the 1996 Atlanta Games where nearly 12,000 representatives from 197 nations will assemble, numbers never conceived or envisioned by de Coubertin.

SOURCE MATERIALS

I will present a range of views on diet and training of athletes in the ancient Mediterranean using information available through the study of art and classical literature. A great diversity of Greek and Latin texts has survived, documenting sporting events, training and recreational activities. When these documents are read in historical sequence, students of sport history can easily identify the military origins of many events such as boxing, javelin, jumping, running (with or with-

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³ To commemorate the Olympic centennial, we have prepared a broad range of topical, sport-related bibliographies. We offer these resources to all at web site: <http://www-nutrition.ucdavis.edu/Olympics/main.htm>.

out armor) and wrestling. Examination also reveals changes in diet and training techniques. The texts also document issues that have plagued sporting events throughout the centuries: bribery, cheating, injury or death during training or competition, and the concept of winning at all costs.

The theme of athletics in antiquity has attracted multitudes of writers through the centuries, whether on sport in ancient Egypt (Decker 1971 and 1987, De Vries 1960, el Habashi 1992, Touny and Wenig 1969), ancient India (Bharat 1982, Deshpande 1992, Raj 1977), ancient Palestine (Hubner 1992), Phoenicia (Boutros 1981), or even ancient Meso-America (De Borhegyi 1980, Linden 1993). Further, several bibliographies on sport in antiquity are available in most research libraries (Maroti 1980, Scanlon 1984).

Most information available for examination, however, focuses on athletic events of the Greeks and Romans. Among the earliest works to summarize aspects of Greek and Roman daily life in the English language is the book by Obadiah Walker, written more than 300 years ago. Walker briefly described Greek and Roman "exercises," among them boxing, leaping, quoining (hurling the discus), running and wrestling (Walker 1692).

If one focuses on secondary sources written during the past 50 years, the literature is enormous. Books by Buchanan (1976a and 1976b), Butler (1931), Gardiner (1910 and 1930), Harris (1964, 1966a, 1966b and 1972), Krause (1971) and Olivova-Pavova (1984) were among those regularly consulted when formulating this review, whereas journal accounts by Crowther (1985a and 1985b), Langdon (1990), Lee (1984 and 1993) and Romano (1985) provided research details that illuminated issues as diverse as ancient weightlifting techniques, how to cheat in boxing, organization of the pentathlon, and how the discus was thrown in antiquity. Other works dissect the myth and reality of Greek runner Philippides and whether he ran from Marathon to Athens, from Marathon to Sparta, or if he ran at all. Still other documents available from antiquity identify nonsporting issues associated with the Olympics, for example, bribery, fines levied against athletes, and political boycotts.

MEDITERRANEAN SOCIETY: ATHLETICS AND SPORT

Athletics and sport in the ancient Mediterranean world begin with mythology, are refined and defined through warfare, and ultimately emerge as competitive events celebrated at four geographical localities: Delphi, Isthmia, Nemias and Olympia.

Theseus, son of Aegeus and Aethra, is credited with developing three sports: weight lifting, wrestling and gymnastics. It was Theseus who lifted the great stone at Troizen; it was he who wrestled and defeated the giant Cercyon through an understanding of leverage, skill and wit. It was Theseus, again, who trained the Athenian children sent to the court of King Minos in Crete in the arts of gymnastic vaulting and bull-leaping (Plutarch, 15:1–20:3).

Greek mythology also presents examples of prominent runners, especially Atalanta, daughter of Schoeneus, king of Scyros. All suitors for Atalanta's hand were required to race against her and win. Whereas the men ran unarmed, Atalanta was permitted to carry a dagger. Each prospective suitor was provided a head start because Atalanta's speed was well known. If he arrived first, the prize was marriage; if Atalanta won, the suitor was slain by Atalanta herself. Ancient poets and writers state that despite numerous negative outcomes, the suitors continued to line up and challenge Atalanta's speed. None was successful, however, until Hippomanes, son of Macareus

and Merope, defeated Atalanta through a ruse that succeeded because she paused to retrieve a token that Hippomanes dropped at a critical juncture of the race. Ovid writes that after Hippomenes' victory, the couple fell instantly and passionately in love, and so impatient were they to initiate love-making that the couple sought privacy and retired inside the temple of Cybele. But because of their lustful transgression in the presence of the great Earth Mother, the lovers were transformed into lions (Ovid, *Metamorphoses* 10: 560 ff.).

ATHLETICS: FROM MYTHOLOGY TO FACT

Homer, approximately 750 B.C., provides the transition from sport-related mythology to athletic fact. Homer identified athletic activities as part of military training and described eight events at the funeral games held in honor of Patroklos. The first competitive event in the funeral games was a chariot race, followed by boxing, wrestling, running, close combat in military gear, discus, archery and javelin. Seven of these eight events obviously are military related. Homer describes the discus event only as "hurling a lump of iron," and the origin of this event remains obscure (Homer *Iliad* 23).

As we move from the Homeric era into the historical period, a range of texts can be inspected that contain accounts of athleticism and sport, diet, and training. Several compendia related to athletics are available to scholars not trained in the Classics. Here Greek and Latin passages on athletics and sport have been translated into English for easy reference (Miller 1979 and 1991, Robinson 1981, Sargent 1927, Sweet 1987). Perhaps the three most important sport-related primary documents from antiquity were authored by Lucian (A.D. 120–ca. 180), Galen (A.D. 131–201) and Flavius Philostratos (A.D. 170–249).

ATHLETIC TRAINING

The account on running by Lucian is especially interesting, given that he clearly states the need to train for distance as well as speed work. Furthermore, he was the first, but not the last, to recommend running in sand:

We train [young men] to run, getting them to endure long distances as well as speeding them up for swiftness in the sprints. This running is not done on a firm springy surface but in deep sand, where it is not easy to place one's foot forcefully and not to push off from it, since the foot slips against the yielding sand. We train them to jump over ditches . . . or any other obstacles [and] we train them to do this even when they carry lead weights as large as they can hold. (Lucian, *Anacharsis* 27).

Galen, the prominent Greek physician, was the doctor to gladiators, and he practiced medicine at Pergamum, in the geographical region now in western Turkey. His principle contributions to athletics are through two essays that consider exercise in general and how to train gladiators. He presents the advantages of exercise using a small ball, as the following selection reveals:

The best philosophers and the best doctors among the ancients have frequently stated how beneficial exercise is toward health, and that it must precede eating. . . . I say that the best athletics . . . are those which not only exercise the body but are able to please the spirit. . . . Play with a small ball is so much a people's activity that even the poorest man is able to have the equipment. . . . [Such exercise] needs neither nets nor weapons nor horses nor hunting dogs, but only a ball, and a small one at that. . . . This kind of exercise is the only one which moves all parts of the body so very equally. . . . Many [other] exercises achieve an opposite effect: they make people lazy and drowsy and dull witted. . . . [Many] who work out at the

palestra [tend] toward being muscular rather than toward the pursuit of excellence. Many have become so weighed down that they have difficulty breathing. . . . Perhaps you will suppose that I recommend running and other exercises that slim down the body. . . . That is not the case. . . . I assert that every [exercise] should be practiced in moderation. . . . Accordingly, I do not approve of . . . running [with] which people slim their bodies and in which they gain no practice or manly spirit. Victory does not go to those who flee quickly but to those able to persevere in confrontation. . . . If you should ask how healthy running is, the answer is that in the same measure that it unequally exercises the parts of the body, it is unhealthy. For by definition [running] has to overwork some parts and leave others utterly idle. Neither of these is good, [and] both nourish the seeds of diseases and render one's forces feeble. Accordingly, I approve of exercise which produces a healthy body and a balance between the various parts of the body, and along with that a fine spirit. This is what arises from exercise with a small ball. . . . Sprinting has already destroyed many by rupturing a main blood vessel. . . . Riding has often broken organs around the kidneys and the chest. . . . So also for jumping, for the *diskos*, and for exercises involving bending. . . . Exercises with a small ball . . . entail no danger . . . [and] should appear to be of all activities the best suited for one's benefit. (Galen, *On Exercise with a Small Ball* 5: 899–910)

Philostratos described training activities that included endurance running, lifting weights, and exercise that included wrestling with beasts, especially lions. His approach would be what professionals today call “cross training:”

[Some athletes in the past] trained by carrying heavy weights, others by chasing hares and horses, or by bending and straightening thick rods of wrought iron. . . . Others yoked themselves with strong oxen to pull wagons, or bend back the neck of bulls . . . and some did the same with lions. . . . The boxer Tisander from Naxos used to swim around the headlands of his island and went far out to sea using his arms, which in exercising the rest of his body also received exercise themselves. (Philostratos, *Concerning Gymnastics* 43)

Beyond these three central works on sport training in antiquity are accounts that consider athletic prowess. Consider, for example, the concept of resistance training, sometimes attributed to the Greek athlete Milo of Croton, son of Diotimos, who participated in seven Olympiads and won six wrestling victories. Tradition holds that when competing in his seventh Olympiad, Milo lost to the younger, more able Timasitheos. It is said that Milo developed his enormous strength by lifting a recently delivered calf; then he repeated the lift each day until the calf matured. Accounts state that Milo reveled in demonstrating this lifting feat and that he could carry the adult bull with ease. A variation reports that Milo once took the bull with him to Olympia, hoisted it, and carried the animal around the stadium, whereupon he butchered the beast and ate it—all in one day. Complementing the mythology of Milo's diet is the report that he daily ate 20 pounds of meat and 20 pounds of bread, then washed it down with eight quarts of wine. Although clearly an athlete of unusual strength and prowess, Milo was not bright. Tradition holds that while walking near his home city of Croton in Italy, he came upon a partially split tree in which woodsmen had left their wedges inside the crack. Milo had the idea of putting his hand inside the crack, to split the tree himself. When he exerted lateral pressure, however, the wedges fell out and the two parts of the tree trunk sprang back, trapping his hands. Immobilized, Milo was attacked by wolves and devoured (Athenaeus, *Deipnosophists*: 10:412:F; Pausanias, *Description of Greece* 6:145; Quintilian, *Institution of an Orator* 1:9:5).

THE TETRAD

Philostratos described the traditional Greek athletic training system as a four-day cycle known as the tetrad (*ἡτετρας*):

By the tetrad system we mean a cycle of four days, each one of which is devoted to a different activity. The first day prepares the athlete; the second is an all-out trial; the third is relaxation; and the fourth is a medium-hard workout. [Regarding] exercise of the first day . . . [it] is made up of short, intense movements which stir up the athlete and prepare him for the hard workout to follow on the next day. [This] strenuous day is an all-out test of his potential. The third [day] employs his energy in a moderate way, while on the day of the medium workout [or last day], the athlete [himself] practices breaking holds and preventing his opponent from breaking away. (Philostratos, *Concerning Gymnastics* 47)

The tetrad system of hard vs. light work-out days was not without its detractors, however, as Philostratos noted:

While the gymnastes [athletic trainers] are following this fixed routine of the tetrad, they pay no attention to the condition of the athlete they are training, even though he is being harmed by his food, his wine, the secret snacks he eats, mental strain and fatigue. . . . How can we [prepare such an athlete] by a schedule of tetrads? (Philostratos, *Concerning Gymnastics* 47)

FOOD AND DIET

Specific texts that describe the diet of ancient athletes are rare. Tomb and temple texts from ancient Egypt identify rations for soldiers and workers of various occupations, but references to the foods of Egyptian athletes are lacking, and any mention dates only to the Ptolemaic, or Greek, and subsequent Roman periods of Egyptian history (Darby et al. 1977).

There is a curious confusion regarding the role of the philosopher Pythagoras in instituting dietary change among athletes. Diogenes Laertius, who flourished in the early decades of the 3rd century A.D. (died 222 A.D.), wrote:

Pythagoras is said to have been the first to train athletes on a meat diet. The first athlete he did this with was Eurymenes. Formerly, [athletes] had trained on dried figs, moist cheese, and wheat. (Diogenes Laertius, *Lives of the Philosophers* 8:12)

Pythagoras of Samos, the famed philosopher, was a vegetarian and furthermore did not eat several varieties of legumes (Ayckroyd and Doughty 1964). Diogenes Laertius concluded that credit for introducing meat to the diet of athletes belonged to a trainer with the same name. An alternative name, however, was identified by Pausanias, a near contemporary of Diogenes Laertius, who wrote:

The record of Dromeus of Stymphalos as a long-distance runner was exceptional; he won two victories in the *dolichos* [long foot-race] at Olympia, the same number in the Pythian Games, three at the Isthmian, and five at the Nemian. He is said to have first thought of eating meat as part of his training diet. Until then, the food for athletes was cheese fresh out of the basket. (Pausanias, *Description of Greece* 6:7:10)

Philostratos, writing later than Pausanias, compared and contrasted early and contemporary athletic diet through the years:

These athletes [in olden times] washed in rivers and springs . . . learned to sleep on the ground . . . others on beds made of straw they gathered from the field. Their food was bread made from barley and unleavened loaves of unsifted wheat. For meat they ate the flesh of oxen, bulls, goats, and deer; they rubbed themselves with the oil of the wild olive and *phylia*. This style of living made them free from sickness and they kept their youth a long time. Some of them competed in eight Olympic games, others for nine; they were also excellent soldiers. . . . They made war a training for athletics, and they made athletics a military activity. (Philostratos, *Concerning Gymnastics* 43)

Philostratos also described how athletic training and popular attitudes towards athletes had changed through the centuries, how men of his time had become “civilians” instead of soldiers, lazy instead of energetic, soft instead of tough. He laments:

[Since] the Sicilian style of fancy food [recently has] gained popularity, the guts went out of athletics and more important, trainers became too easy on their pupils. . . . Doctors introduced permissiveness. . . . [Doctors] gave us chefs and cooks to please our palates. They turned athletes into gluttons with bottomless stomachs. Doctors fed us white bread made of ground meal sprinkled with poppy seeds, and introduced the eating of fish, contrary to previous medical practice. . . . They also introduced [to athletes] the use of pork [and] a collection of wonderful theories. (Philostratos, *Concerning Gymnastics* 44)

The concept that overeating produced visual cues on the body or face that helped an athlete gauge his opponent's level of training was widely accepted in antiquity, and Philostratos provided several observations thought to provide a “competitive edge”:

You can recognize an athlete who overeats by his thick eyebrows, gasping breath, and prominent collarbones, as well as rolls of fat around his waist. Those [athletes] who drink too much wine have an excessive paunch . . . [and] too much drinking is discovered by a fast pulse. (Philostratos, *Concerning Gymnastics* 48)

Athletes in antiquity, as today, did not always adhere strictly to a dietary-training regimen, and Philostratos describes treatment for those who on occasion overindulged and broke training:

Those [athletes] who have eaten too much . . . should be massaged in a downward direction, so that the excess weight may be removed from the important parts of the body. Pentathletes [who have overeaten] should practice one of the light events; runners [who have overeaten] should not push themselves too much but should take an easy workout, striding out with only a suggestion of hard effort; boxers should spar at arm's length and should dance lightly about as if on air. Wrestlers . . . should practice upright wrestling, but they should also practice falling and rolling. (Philostratos, *Concerning Gymnastics* 50)

Philostratos also noted that overeating was not the issue, but drunkenness:

An excess of wine in the athletes' bodies requires moderate exercise to bring on sweating. We should not make people in this condition take hard exercise, but we should not excuse them from their workout entirely. (Philostratos, *Concerning Gymnastics* 51)

ANCIENT ATHLETES AND SOCIETY

The concept of idealism holds that participation in athletics, whether in the Olympics or other athletic venues, is its own reward; to participate is important, not winning. This idealistic view, born in antiquity and nurtured through the centuries, resulted in the misconceptions regarding “athletic purity.” Beyond participation, there always have been rewards for the victors:

And all those who have won an athletic event at the Olympic, Pythian, Isthmian, or Nemian Games, shall have the right to eat free of charge in the city hall, and also have other honors in addition to the free meals. (*Inscriptiones Graecae* 1:77)

Winners of the pan-Hellenic competitions, whether at Olympia or elsewhere, were also exploited during their years of athletic glory by city magistrates. As the athletes matured and aged, praise from city administrators sometimes turned sour, as evidenced in this account written by Athenaeus, who lived in Egypt during in the 2nd century A.D.:

For all of the many thousands of evils which now beset Greece, nothing is worse than the breed of athletes. . . . Glorifying in

their youth [they are paraded] through the city and are ornaments to it. But when bitter old age falls upon them, they are discarded like a threadbare cloak. For what does it [then] benefit the state if a man wins a crown . . . by being swift of foot or good at throwing the discus or skillfully [boxing]? Will [the athlete] fight better in battle? (*Deipnosophists* 10: 413)

As the population increased and the number of competitors and pool of talent expanded, quality athletes at the pan-Hellenic games encountered more difficult competitors. With less time and motivation for training, the dark side of athletics became evident, as noted by Philostratos:

[Their] luxurious way of living stimulated the sex urge and the athletes began to engage in illegal transactions of money, buying and selling victories. (Philostratos, *Concerning Gymnastics* 45)

Gender testing, in the sense understood in the 20th century, was not necessary in the ancient Greek world, because athletes participated in the nude. The issue of women attending athletic games, however, presents a paradox. Pausanias writes that female virgins could watch the games at Olympia, but elsewhere in describing the approach to Olympia, a geographical region near the Alpheios river, where Mount Tropaion towers over the valley, he notes that any woman discovered at an Olympic festival or trespassing on the Olympian side of the Alpheios below Mount Tropaion was restrained, carried up the slope of Tropaion, and executed by being tossed from the heights. He continues that only men participated in the games until the entry of Kyniska, daughter of the Spartan King Archidamos, and she achieved an equestrian Olympic victory. Pausanias also describes an athletic event for women, called the Heraia, held every fourth year at Olympia. This consisted of several foot races. Female participants were limited to sixteen virgins of different ages (Pausanias, *Description of Greece* 3:8:1; 5:6:7–8; 5:16:2–8).

Although men participated in athletic events nude, trainers could wear cloaks. According to Philostratos, this differential system was satisfactory until an incident involving Pherenike of Rhodes, daughter of the boxer Diagoras:

Her physical appearance was such that the Eleans [citizens of Olympia] at first thought she was a man. At Olympia she wrapped herself in her cloak and trained her son, Peisidoros, who was a skilled boxer, the equal of his grandfather. When the Eleans learned about the trick, they hesitated to execute Pherenike . . . but they passed a law that the gymnastes [trainers] must take off [their] clothes and [thus] submit to a physical examination. (Philostratos, *Concerning Gymnastics* 17)

Athletic competition and training were undertaken with some risk. Athletes suffered serious injuries, sometimes untimely death. Pausanias describes an incident at the Nemian Games where the boxer Kreugas was awarded the victory although he was dead. His opponent, Damoxenos of Syracuse, landed a foul blow under Kreugas' rib cage and penetrated the intestinal cavity. Pausanias writes that Damoxenos then grabbed Kreugas' intestines and pulled them out, whereupon Kreugas died “on-the-spot.” Damoxenos was disqualified by the judges, and a victory statue ultimately was raised to the memory of Kreugas at his home city, Argos (Pausanias, *Description of Greece* 8:40:1–5).

Overeating and embarking upon a too rigorous training regimen was dangerous, as Philostratos observed:

[Regarding the wrestler Gerenos] he won at Olympia. For two days afterward he celebrated his victory by drinking, entertaining his friends, and eating fancy food. As a consequence of this unaccustomed way of life, he was short on sleep. On the third day after his victory he came to the gymnasium and told his trainer that his stomach was upset and that he felt terrible in other ways. The trainer lost his temper . . . and was indignant that in breaking training [Gerenos] had upset the tetrad

schedule. . . . [In his ignorance] the trainer brought about his pupil's death in the middle of the workout by assigning the kind of exercise which he should have had sense enough to avoid. (Philostratos, *Concerning Gymnastics* 54)

Despite athletic bribery, controversy over women in competition, injury or death in competition, and the philosophy of some athletes of winning at all costs, the ideal of athletic purity remained. Hard work and training effort brought the athletes to Olympia, Delphi, Isthmia and Nemias, and in antiquity as today, there would be victors and there would be participants.

Epictetus, a philosopher of the 1st–2nd century A.D., provides a telling passage that rings through the centuries, heard by all—ancient and modern—who would aspire to be an Olympic champion:

You say “I want to win at Olympia.” Look at what is involved both before and after, and only then, if it is to your advantage, begin the task. If you do, you will have to obey instructions, eat according to regulations, keep away from desserts, exercise on a fixed schedule at definite hours, in both heat and cold; you must not drink cold water nor can you have a drink of wine whenever you want. You must hand yourself over to your coach exactly as you would to a doctor. Then in the contest itself you must gouge and be gouged; there will be times when you will sprain a wrist, turn your ankle, swallow mouthfuls of sand, and be flogged. And after all that . . . there are times when you [will] lose. [And] you say, “I want to win at Olympia.” (Epictetus, *Discourses* 15: 2–5)

I conclude this historical portion of my presentation on ancient athletics, diet and training with three passages that demonstrate the difficulties of athletic success and “being a winner.” The first text is from Aelian, a writer of the early 2nd century A.D., who describes how important it is to not let opponents know if you are hurt or injured:

Eurydamas of Cyrene won the boxing, even though his opponent knocked out his teeth. To keep his opponent from having any satisfaction, he swallowed them. (Aelian, *Various History* 10:19)

The second passage reveals the need for dedication and training even knowing that once the prize has been attained, the mountain top achieved, the only way off the height is down. The descent, however, can be graceful and poised, or ungraceful and possibly tragic. Victors at Olympia were crowned with branches of olive; at Isthmia crowns of pine; at Nemias crowns of wild celery; and at Delphi, athletes received a crown of laurel. Lucian attributes the following passage to the 6th century B.C. Scythian sage Anacharsis:

[The crowns] cannot be acquired without pain, and the man who wants [one] must endure many hardships in the beginning before he can even start to see the profitable and sweet end of his efforts. (Lucian, *Anacharsis* 9:14)

When victory is the reward, the future is bright. But more frequently than not, victory is not the reward and the descent from the heights can turn tragic. Pausanias describes the illness and madness that followed disqualification of Kleomedes of Astypalaia, who killed Ikkos of Epidaurus during Olympic competition in 492 B.C.:

When [Kleomedes] was convicted . . . of foul play and stripped of his victory, he went out of his mind with grief and returned to Astypalaia . . . [where] he attacked a school with about 60 children in it and pulled down the column which supported the roof, which [then] fell on the children. (Pausanias, *Description of Greece* 6:9:6–7)

FROM ATHENS TO ATLANTA

The first Olympiad of the modern era was celebrated in 1896 in Athens, Greece; during the summer of 1996 the city of Atlanta, Georgia, will host the Centennial Olympic Games.

At the 1896 Games in Athens, only the first- and second-place athletes received medals; the 800-m winning time was 2:11.0, a mark I exceeded when I was in my twenties. The winning high jump in 1896 was 5' 11.25", a height cleared by one of my high school classmates. Note, too, that Garrett's winning discus toss in Athens was a mere 95' 7.25".

Scientific and medical papers related to sports did not emerge from the Athens games; rather scientific and medical interest in Olympic athletes stems from only 1922. In this portion of our presentation we will discuss a suite of three articles on diet and nutrition of Olympic athletes who participated at the Berlin games of 1936.

The Berlin Games, 1936

The first paper by Paul Schenk poses a basic question: “What do the best sportsmen of the world eat?” Schenk writes that the Olympic athletes competing at Berlin frequently focused upon meat, that athletes regularly dined on two steaks per meal, sometimes poultry, and averaged nearly half a kilogram of meat daily. Schenk writes that pre-event meals regularly consisted of one to three steaks and eggs, supplemented with “meat-juice” extract. Schenk noted that other athletes, however, stressed the importance of carbohydrate in the context of muscular work, and he reported that Olympic athletes from England, Finland and Holland regularly consumed porridge, the Americans ate shredded wheat or corn flakes in milk, and the Chileans and Italians feasted on pasta. He wrote that members of the Japanese team at Berlin consumed a pound of rice daily. He also stressed the importance of wheat bread prepared from white flour (Schenk 1936).

In his initial paper, Schenk also published energy and composition data from the national teams participating at Berlin. Olympians he studied averaged intakes of 320 g of protein, 270 g of fat and 850 g of carbohydrate, with some athletes consuming 7300 kcal/d. He compared his data with Voit's calculations for daily intake of a 70-kg man: 118 g of protein, 56 g of fat, and 500 g of carbohydrate, with a recommended daily caloric intake of approximately 3000 kcal. Schenk observed that there was a general “struggle for all people of the earth in these days” to consume enough meat. Then he writes that the “protein theory” for health was incorrect. He concludes with a statement, perceptive for the time, that applauds the dietary role of fruit, tomatoes and fresh vegetables for elite Olympic athletes (Schenk 1936).

Schenk published his second Olympic-related paper in 1937 and documented the food patterns of 42 of the 49 national teams that ate in the Olympic village. Four examples from his data summaries are revealing:

American Olympians consumed beefsteak (primarily rare or medium), had average daily intakes of 125 g of butter or cotton oil, three eggs, custard for dessert, and drank 1.5 L of milk. The American pattern was also characterized by ad libitum consumption of white bread (usually toasted), dinner rolls, fresh vegetables, especially English spinach, and salads. Also available to American athletes were apples, bananas, fresh and stewed tomatoes, dried apricots and prunes, honey and cheese. In contrast with other Olympic national teams competing at Berlin, Americans ate no citrus and limited their intake of sugar (Schenk 1937).

Argentinean athletes consumed near-bloody beefsteak fried in oil, beef extract, chicken with saffron-spiced rice, and small quantities of veal; they avoided pork. They dined on oil-fried potatoes, butter and olive oil, toasted white bread, pasta, ravioli, potato pasta, creamed corn, various vegetables, fresh fruit, citrus, honey, sugar and tomatoes (Schenk 1937).

TABLE 1

*Olympic team dietary characteristics: aggregate food-pattern data from the 11th Olympiad, Berlin, Germany, 1936¹***Meat and Meat Products:**

Meat (total intake):

≥800 g/d: Argentina, Australia/New Zealand, Austria, Bermuda, Brazil, Canada, Czechoslovakia, Egypt, Estonia, Germany, Greece, Holland, Hungary, Iceland, Italy, Malta, Philippines, Switzerland, United States, Uruguay, Yugoslavia

≤500 g/d: Finland, Holland, India, Poland, Turkey

Sausage and prepared meats:

Primary consumers: Finland, Norway, Sweden

Minimum consumers: Canada, Iceland, Latvia, Poland

Dairy Products:

Butter:

≥250 g/d: Afghanistan, Bermuda, Czechoslovakia, Germany, Latvia, Philippines, South Africa, Sweden, Turkey, United States

≤100 g/d: Brazil, Chile, England, France, Greece, Holland, Italy, Luxembourg

Cheese:

≥100 g/d: Egypt, Finland, Greece, Italy, Sweden, United States, Yugoslavia

≤50 g/d: Argentina, Bermuda, Brazil, Canada, Czechoslovakia, England, Germany, Japan, Norway, Turkey, Uruguay

Milk:

≥2 L/d: Afghanistan, Bermuda, Brazil, Finland, Holland, Iceland, India, Norway, South Africa, United States

≤500 ccm/d: Austria, China, Egypt, France, Hungary, Japan, Philippines, Poland, Switzerland, Turkey, Yugoslavia

Vegetables and Mixed Salad:

Vegetables (beans, beets, cabbage, cauliflower, peas, spinach)

≥500 g/d: Afghanistan, Argentina, Holland, Japan, Turkey

≤100 g/d: Chile, China, England, Greece, Iceland, Italy, Luxembourg, Malta, Peru, South Africa, Uruguay

Mixed salad (not defined further):

≥500 g/d: Afghanistan, Australia/New Zealand, Chile, Czechoslovakia, Luxembourg, Switzerland

≤100 g/d: Brazil, Germany

Primary Carbohydrate Foods:

Potato:

≥500 g/d: Canada, France, Hungary, Peru

Minimum (quantity not defined): Afghanistan, Belgium, Bulgaria, Egypt, Iceland, Italy, Malta, Norway, Uruguay

Rice:

≥500 g/d: Afghanistan, Chile, France, Japan, Yugoslavia

≤100 g/d: Italy

Pasta (macaroni, noodles, and/or spaghetti):

≥250 g/d: Chile, Czechoslovakia, France, Italy

≤125 g/d: Argentina, Austria, Brazil, China, Egypt, Greece, Iceland, Philippines, Poland, Turkey

Bread:

≥400 g/d: Argentina, Brazil, Canada, Chile, Holland, Italy, Malta, Philippines, Turkey, Uruguay

≤100 g/d: India, Japan, Peru

Fruit:

Fresh fruit (unspecified; emphasis on apples):

≥500 g/d: Afghanistan, Argentina, Austria, Belgium, Bermuda, Brazil, Bulgaria, Chile, China, Denmark, Egypt, England, Estonia, Finland, Germany, Greece, Holland, Iceland, India, Italy, Latvia, Luxembourg, Malta, Mexico, Norway, Peru, Philippines, Poland, South Africa, Sweden, Switzerland, Turkey, United States, Uruguay, Yugoslavia

≤250 g/d: France, Hungary

Citrus (specifically lemons):

≥50 g/d: Argentina, Australia/New Zealand, Bulgaria, Chile, Estonia, Finland, Italy, Poland, Turkey, Hungary

None: Afghanistan, Austria, Bermuda, China, Denmark, France, Greece, Iceland, India, Malta, South Africa, Switzerland, United States Yugoslavia

Sweeteners:

Sugar:

≥150 g/d: Afghanistan, Austria, Estonia, Greece, Hungary, Poland, South Africa, Turkey

≤30 g/d: Denmark, Germany, Japan, Norway, Switzerland, United States

Honey:

≥100 g/d: Afghanistan, Argentina, Australia/New Zealand, Bermuda, Bulgaria, Egypt, England, Iceland, Poland, South Africa, Switzerland, Turkey, United States, Uruguay, Yugoslavia

≤50 g/d: Belgium, Brazil, Canada, Chile, China, Denmark, Germany, Greece, Hungary, Malta, Mexico, Sweden

Beverages:

Coffee (identified as strong): Argentina, Australia/New Zealand, Brazil, Estonia, Greece, India, Italy

Milk:

≥2 L/d: Afghanistan, Bermuda, Brazil, Finland, Holland, Iceland, India, Norway, South Africa, United States

≤500 mL/d: Austria, China, Egypt, France, Hungary, Japan, Philippines, Poland, Switzerland, Turkey, Yugoslavia

Whisky (undefined quantities): Canada

Wine [undefined (daily?) quantities]: France, Italy

Miscellaneous:

Grape-Nuts cereal: Argentina, Canada, China, Finland, Japan, South Africa, Sweden

Supplements:

Glucose: Austria, Egypt, France, Germany

Lecithin: Poland

Malt: Austria

Cigarettes/smoking: none

Moderation in eating: Canada, Finland, Iceland, Poland, Sweden

¹ From Schenk (1937).

TABLE 2

Olympic team dietary characteristics: dietary classification data from the 11th Olympiad, Berlin, Germany, 1936¹

Country	Protein-rich foods	Vitamin-rich foods	CHO	Fat	Total amount
<i>g</i>					
Brazil	982	657	639	84	2362
England	1448	823	978	116	3365
France	1049	868	928	107	2952
Germany	1265	739	661	86	2751
India	1506	860	636	126	3128
Italy	885	964	707	118	2674
Japan	858	733	762	79	2432
United States	1494	961	964	96	3518

¹ From Egle (1937). CHO = carbohydrate.

The diet of the Chinese contingent, in contrast, was based upon pork and fish served with 250 g of rice, as well as undefined quantities of beefsteak. In addition, members of the Chinese national team consumed daily 100 g of butter, three eggs, white bread, and four dinner rolls. Their meals included fresh vegetables and fruits, especially apples, bananas, salads and tomatoes, as well as honey. The Chinese drank limited quantities of milk, iced tea and orange juice. Schenk writes that the Chinese consumed large quantities of sugar and that they spiced their rice dishes with Western-style condiments, specifically Worcestershire sauce and tomato ketchup (Schenk 1937).

Japanese Olympians at Berlin limited their intake of beefsteak and veal but stressed pork and lamb at lunch and at evening meals. The daily Japanese pattern was characterized by 80 g of butter, two or three eggs, six dinner rolls, 1 pound of rice, 1 pound of potatoes, with fresh vegetables and soybean. Japanese participants consumed a total of 50 kg of bananas, most by long-distance runners in the 10-km and marathon events. The Japanese limited their sugar intake to 30 g per person per day; curry, pepper and salt were the condiments of choice. He estimated average daily energy intake of the Japanese participants at 5500 kcal (Schenk 1937).

Having characterized the national food patterns of the Olympic athletes, Schenk then categorized his data into primary versus minimal intakes for 28 food categories (Table 1). Regarding dairy products, the American contingent stressed butter, cheese and milk. India, which lies within a geographical zone characterized by limited milk consumption, presents an enigma because Schenk's data describes Indian athletes as great milk drinkers, probably because the team consisted primarily of British colonials. Leafy green vegetables were not prominent in the diets of many national teams and were practically nonexistent at Brazilian and German dining tables. Most Olympic national teams that Schenk surveyed avoided potatoes, exceptions being Canada, France, Hungary and Peru. Rice characterized Japan as expected, but not China; pasta typified Italian meals, but also appeared on the dining tables of Olympians from Chile, Czechoslovakia and France. High bread intake characterized only 10 of the 42 nations surveyed, and athletes from India, Japan and Peru minimized their bread consumption. A majority of national teams (35 of 41 countries) stressed fresh fruit, mainly apples. In contrast, French and Hungarian national teams consumed small quantities of fruit. The importance of citrus (lemons) was not universal, and members of the American Olympic team did not consume citrus. National

teams from Afghanistan, Poland, South Africa and Turkey were high consumers of both honey and sugar; Denmark and Germany were low consumers of sweeteners. Table 1 reveals that strongly brewed coffee characterized the Olympic training table regimens of six nations. Interestingly, coffee was not a significant component of the diet of athletes from Austria, Mexico, Peru, Switzerland, Turkey, or the United States—nations known for coffee drinking. Whisky was offered to members of the Canadian Olympic team throughout the games, and an undefined quantity of wine was consumed daily by athletes from France and Italy. Regarding miscellaneous foods, Table 1 shows that Grape-Nuts cereal was a breakfast item regularly served to Olympic athletes from seven countries, but not to the American contingent, the nation where Grape-Nuts was invented. Schenk identified three dietary supplements used by the Olympians: glucose was given daily to Olympians from Austria, Egypt, France and Germany; a malt supplement was taken by Austrian athletes; and a lecithin supplement provided to Polish athletes. None of the athletes interviewed smoked cigarettes (Schenk 1937).

Schenk did not correlate athletic performance at the Berlin games with food intake or specific dietary practices, whether medalists versus finalists, finalists versus competitors, or medalists versus competitors. Perhaps the lessons that emerged (or would have emerged) were too politically and racially sensitive to be published in Nazi Germany at the time.

The third paper from the Berlin Olympics of 1936 is by Mary Egle. Like Schenk, she took an aggregate approach to her data summation, and based her discussion on four food-pattern variables: protein/meat, vitamin-rich foods, carbohydrate items, and dietary fat. Like Schenk, Egle did not display or analyze her data by sex or sport, nor did she cluster groups into different categories based upon energy expenditure level.

Two points emerge from her paper (Table 2). First, the Olympic athletes focused on protein-rich foods, and second, fruits and vegetables offered higher vitamin potential than other food categories. Egle's high carbohydrate food category

TABLE 3

National vs. Olympic team dietary characteristics: protein, fat and carbohydrate (CHO) as percentage of energy (comparative data from the 11th Olympiad, Berlin, Germany, 1936)¹

Nation and team	Protein	Fat	CHO
<i>%</i>			
England			
National average	13	33	54
Olympic team	16	39	45
Germany			
National average	12	31	57
Olympic team	18	37	45
Italy			
National average	11	19	70
Olympic team	13	37	50
Western Europeans			
National averages	11	21	68
Olympic teams	16	37	48
Japan			
National average	10	8	82
Olympic team	15	31	54
United States			
National average	12	35	53
Olympic team	16	34	50

¹ From Egle (1937).

TABLE 4

*Olympic Village food purchase requirements for 33 d
(26th Olympiad, Atlanta, United States, 1996)¹*

Item	Quantity
Anchovies	665 pounds
Apples	270,000 pounds
Asparagus	15,498 pounds
Beef	240,000 pounds
Black-eyed peas	3333 pounds
Bread	
Baquettes	11,000
Loaves	23,000
Rolls (French)	20,000
Cereal	15,625 pounds
Cheese (Cheddar)	9,057 pounds
Eggs (fresh)	48,000 dozen
Garlic	1034 pounds
Lettuce (raddicchio)	30,000 pounds
Margarine	32,800 pounds
Milk	70,000 pounds
Mushrooms (fresh)	25,000 pounds
Onions (green)	46,560 bunches
Parsley (fresh)	10,827 bunches
Pasta	52,000 pounds
Peaches	56,600 pounds
Potatoes	34,000 pounds
Poultry	150,000 pounds
Rice	34,000 pounds
Spaghetti	7850 pounds
Strawberries	23,342 pints
Tomatoes	17,998 pounds
Water (bottled)	550,000 gallons
Miscellaneous:	
Aluminum foil	19 miles
Cups	5,000,000
Napkins	3,500,000

¹ Information provided by ARAMARK Corporation (Philadelphia, PA).

was broadly inclusive and included cereals, legumes, potatoes, sugar and chocolate. She reported that some Olympic athletes at Berlin consumed 6700–7300 kcal/d (Egle 1937).

Egle identified a relative consistency in aggregate food patterns for British, German and American Olympians, with values considerably higher than aggregate patterns representative of each national population (Table 3). She reported that Japanese and Italian athletes had significantly higher fat and carbohydrate intakes compared with national averages. Egle also reported a characteristic Western European dietary pattern, with a mean daily intake of 3084 kcal, where 11% of energy came from protein, 21% from fat, and 68% from carbohydrate. Her Olympic athlete dietary ideal, in comparison, was a daily mean intake of 4860 kcal, where 16% came from protein, 37% from fat, and 48% from carbohydrate (Egle 1937).

The Atlanta Games, 1996

We have seen how diet and training patterns of Olympic athletes developed in antiquity and how German scientists reported aggregate food pattern information from athletes competing at the 1936 games in Berlin. What will the pattern be at Atlanta, in July of 1996?

More than 5 million meals will be served during the 33-day Olympic festival in Atlanta. Athletes and others dining at the Olympic Village will be offered an "Olympian" menu of foods appropriate for athletes from 197 countries (Table 4). Included will be a very broad range of fresh vegetables and

dips, fruits, cheeses, breads, salad bar, specialty pastas, rice, fruit salads, soups, meat and seafood entrees, hot vegetables, desserts, and beverages. American Southern specialties also will be presented.

From this vast array of food, Olympians from the world's nations will make their specific dietary selections. Some athletes competing in Atlanta may consider nutrition and food selection an inconsequential component of their training; others will practice well-designed dietary plans that are nutritionally sound; others will exhibit food intake patterns perceived to be correct and beneficial, but the pattern will not be based upon scientific data. Still others will blend actual food with an array of dietary supplements. In Atlanta, many athletes will base their dietary plans and use of supplements on scientific principles; others will focus on ritualistic behaviors that previously led to success. Still others will adopt non-scientific recommendations based upon misinformation. All athletes, regardless of the source of their information, will believe in what they eat, and most will consider that their food, diet and supplement pattern will benefit them in their search for victory and a competitive edge, an edge that leads to the medal platform.

And as the athletes dine at the Olympic Village in Atlanta, will any know or recall the ancient words of Epictetus?

You say "I want to win at Olympia . . ." If you do . . . eat according to regulations, [and] keep away from desserts.

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