History of Research on Physical Activity and Health: Selected Topics, 1867 to the 1950s

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Health is an elusive term. So is fitness. Discoveries and developments in the biomedical sciences affect how people think about both health and fitness, as so do a host of social and cultural factors. A judicious use of history can be useful when it sheds light on such matters, and so doing helps researchers to think more comprehensively about contemporary issues and practices. This paper briefly examines two topics that were of interest to educators, physicians, and some researchers in the physiological sciences between 1867 and 1950: the phenomenon referred to as “the athlete’s heart” and anthropometrical/growth and development studies. Historians of exercise science, physical education, and sport might undertake more studies in which the historical record is examined from the perspectives of the biologist, the nutritionist, and/or the epidemiologist.

Three papers recently appeared that provide an apt framework for examining, in a general way, the topic “history of research on physical activity in relation to health.” The Annals of American Medicine declared “Health Care Reform” (1992) to be an American imperative. The first issue of Medicine, Exercise, Nutrition and Health maintained that “evidence . . . from such diverse areas as cardiology, exercise physiology, nutrition, epidemiology, psychology, and health promotion” now exists to support the claim that “daily habits and practices have a profound impact on long-term health” (Rippe & Ward, 1992, p. 1). An article in Public Health Reports: The Journal of the U.S. Public Health Service that same year opened with the following curious statement: “Society is slowly coming to the realization that the health status of children and their educational development are inextricably linked” (Novello, DeGraw, & Kleinman, 1992, p. 3).

Physical educators may rejoice in the fact that during the last 40 years evidence has emerged from diverse fields that supports the value of regular exercise. However, the phrase “slowly coming to the realization” is rather troubling. Perhaps the authors of “Healthy Children Ready to Learn” (Novello et al., 1992) purposely overstated their case. More likely, the assertion underscores the fact that in matters pertaining to health, societies—like individuals—have short memories.

When the American Association for the Advancement of Physical Education (AAAPE) was founded in 1885, improvement of the nation’s health—notably

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through the education of children and youth—was a major, even if not exclusive, goal. Leading physiologists and psychologists, as well as a large number of physicians, expressed interest in the "new profession," so did college presidents, public school authorities, and other contemporaries. Harvard Medical School physiologist William T. Porter, speaking at the annual convention of the AAAPE, declared, "Physical education justifies itself by its relation to the new medicine" (Report of the 1st, p. 217)—by which he meant the promotion of health. At the same AAAPE meetings, Harvard psychologist William James commented on the importance of exercise in the formation of proper habits. A decade earlier, United States Commissioner of Education William Torrey Harris (1889) had characterized physical education as "part of the subject of hygiene in its largest compass" (p. 1)—the reason being that the purpose of physical education was to develop the muscular, circulatory, digestive, and nervous systems. Delivering the keynote address at the same 1889 Boston Conference in the Interest of Physical Training, Edward M. Hartwell (PhD in Biology from Johns Hopkins University, MD from Miami Medical School, and soon to become President of the AAAPE) had suggested that physical education might become the most important subject in the curriculum since the aim of physical education was to promote health and establish the bases upon which all "proper habits" are formed (Hartwell, 1889).

The U.S. Commissioner of Education, one of the most scientifically prepared of all early members of the AAAPE, and Harvard's ranking comparative physiologist and functional psychologist were not alone in believing that the health status of children and their educational development are linked. In the 1890s, physical education was discussed often at meetings of local and state medical societies. Daniel Coit Gilman (1879), the new President of Johns Hopkins University, commented on the value of physical education in his address as president of the American Social Science Association. Two years earlier, with enthuasiasms of centennial celebrations still reverberating, Unitarian minister Abel A. Livermore (1877) had opened a lengthy article with the declaration that the "strength and prosperity" of every nation "lies primarily in its physical stamina" (p. 117). Therefore, Americans must learn to "practice the laws and rules of Life, Health, Development, and Longevity" (p. 134).

Livermore's words, like those of his contemporaries, may sound effusive to our late-20th-century ears, but his sentiments were the same as those that appeared in a 1985 special issue of Public Health Reports: "A clear message that physical activity is beneficial to the body and mind needs to be carefully delivered to all segments of the population" (Mason & Powell, 1985, p. 114). Although Mason and Powell could point to considerable clinical, experimental, and epidemiological evidence to support their claims, a century earlier virtually no such information existed. It is the burden of this paper to comment on how such changes occurred. The subject is large, and to make possible even a modicum of analysis, selection with regard to both time period and topics will be necessary.

I had decided to concentrate on concerns relating to cardiac function before 1940 and to comment briefly on early attempts to assess the health status of children by means of growth and development studies. An observation that the eminent epidemiologist Ralph Paffenbarger made when introducing his special lecture at the 40th anniversary meetings of the American College of Sports Medicine (ACSM) prompted me to add a few comments about the possibility of historical reconstructions of an epidemiological nature. Large-scale studies of vocational and leisure-time physical activity in relation to cardiovascular fitness and the risk of coronary
heart disease (CHD) had not begun until 1949 (Paffenbarger, 1994) when Morris, Heady, Raffle, Roberts, and Parks (1953) commenced their investigation of physical activity and health among 31,000 men employed by the London Transport Service. Not surprisingly, it was found that the sedentary drivers had a much higher rate of coronary events than did conductors, whose jobs entailed climbing the steps of double-decker buses and walking miles.

Since historians are trained to consult "primary source" evidence, I immediately went to the Lancet and discovered an earlier paper in which Morris (1951) had utilized necropsies and hospital pathologies from the period 1907 to 1949 in an effort to determine whether heart disease in England and Wales was on the increase. In this paper, Morris pointed to myriad difficulties involved in attempting any retrospective study. In spite of such admonitions, I will conclude by urging my historian colleagues—quite possibly working with colleagues in the appropriate health sciences—to undertake investigations of an epidemiological nature that must be, by their very nature, retrospective.

The 1950s was a watershed decade in the history of sports medicine and exercise science. Roger Bannister was the first human to run the mile in under 4:00 minutes. The British Association of Sport and Medicine was founded in 1953; the ACSM in 1954. In 1921, the United States Public Health Service had initiated efforts to study morbidity in a single community. Over a period of three decades, investigations that had flowed from the Hagerstown Health Studies had assessed a variety of health-related issues. The United States Public Health Service published these as an extensive bibliography (Federal Security Agency, 1951). Field work for the Tecumseh, Michigan, Community Health Study began in 1957. The comprehensive monograph detailing this massive effort to understand how "the biological, physical, and social environment... interact to enable some individuals to maintain health" (Montoye, 1975, p. 1) contains chapters on the body's responses to exercise, fitness in relation to physical activity, and other exercise considerations.

Across the Atlantic, Sir Adolphe Abrahams (1951) chose as the subject of his Lumleian Lectures "Physical Exercise: Its Clinical Associations." In these lectures he commented briefly on 19th-century interest in such things as exercise and infection, heat-stroke and cramp, exercise and the kidney, and the phenomena that came to be known as "athlete's heart." The last-named phenomenon is the particular focus of this paper. Attention is directed more to sociocultural issues than to biomedical developments since those who are interested in the progression of the basic and applied science may consult Henry Montoye's (1974) excellent review of the relevant research in the second edition of Science and Medicine of Exercise and Sport.

One other point merits brief comment. Health, like fitness, is a term containing a considerable amount of ambiguity. The breadth of the World Health Organization's definition suggests the range of concepts and conditions that might be involved: "a state of complete physical, mental and social well-being, and not merely the absence of disease or infirmity" (cf. Edlin & Golanty, 1985, pp. 5-6). While dedicating a new gymnasium, Sir Russell Brain (1953) observed that health is far more than the absence of 15,000 ways in which a person might become ill in body or mind. Given the occasion, it is not surprising that Sir Russell made note of the status the ancient Greeks had afforded exercise in programs of preventive medicine and hygiene.

While the components of hygiene (e.g., proper rest, cleanliness, diet, exercise) have not changed over the millennia, conceptions of the body have been profoundly altered. Over the last 150 years, the "gaze" (cf. Dreyfus & Rabinow, 1983; Foucault,
1973) has shifted from gross structures, to isolated fibers, to single cells, to recombinant DNA. As late as 1800, the physiology of the Hellenistic physician Claudius Galen still enjoyed favor. By 1900, scientists working in physiological chemistry, bacteriology, and other fields had revolutionized the biological sciences (cf. Coleman & Holmes, 1988).

Within the larger population, however, old beliefs often had—and still have—a remarkable tenacity, frustrating the best efforts of health science professionals. Moreover, the meanings that attach to "health" have been—and continue to be—modified by cultural, economic, and other nonbiomedical matters, as Patricia Vertinsky (1991) ably showed in her 1990 American Academy of Physical Education paper. Ambiguities also abound regarding the term fitness, as Russell Pate (1988) has observed. The profession of physical education historically adhered to a strong conceptual conjunction between health promotion and fitness. However, at times—for example, during the 1960s and 1970s—a much narrower strength, flexibility, and coordination orientation has attracted a great deal of attention.

Further, within physical education—as in medicine (cf. Geison, 1979)—individual perspectives are by no means inconsequential. The investigator at the bench is likely to emphasize elements close to her or his research. The general practitioner will note case histories. The epidemiologist will look at large populations over time. All of this should remind us that any attempt to achieve health reform will need the contributions of the exercise psychologist and the sociologist no less than those of the exercise physiologist, epidemiologist, nutritionist, and clinician. With these observations in mind, I will now turn to some mid-1800s beginnings.

The Debate Over "Athlete's Heart"

In matters pertaining to athletics in relation to health, cultural constructions have operated with considerable force. This was certainly the case in 19th century Britain—the nation that, as contemporaries were wont to proclaim, had "taught the world to play." A series of articles published in The Cornhill Magazine during the 1860s is illustrative of views then prominent. In one, vestiges of Galenic physiology and vitalism were blended with the findings of experimentalists like Herman von Helmholtz and Emil Du Bois Reymond ("Health," 1861). Another, with the telling title "Physiological Riddles: I—How We Act" (1860), attempted to present for the layperson an explanation of contracting muscle as seen under a microscope and changes in nervous tissue that had been expounded by the German chemist Justus von Liebig. Still another mingled prevailing religious and evolutionary views with aspects of the emerging science of animal chemistry ("Physiological Riddles: III—Living Forms," 1866). Perhaps frustrated by all the conflicting proclamations, the author of "Training in Relation to Health" (1864) acknowledged that "with regard to diet, there is at present little beyond a few empirical observations on which we can rely" (p. 230). The same was true with regard to the heart and vascular system, which soon became the focus of intense debate.

As James Whorton (1982a) has cogently observed, when clinical and experimental studies of strenuous physical activity began in the mid-1800s, attention was first directed, not surprisingly, to the heart, "the most obviously vital of organs" (p. 36). It was a new ethos in athletes, however, not science, that brought the issue to the fore. The Oxford and Cambridge boat race was first rowed in 1829; by the mid-1850s, it had become a prestigious annual event attracting well over 100,000
enthusiastic spectators. Contests between oarsmen representing the two elite universities stimulated the formation of similar competitions in track. In 1866, the Amateur Athletic Club (AAC) was organized to help rowing men keep in condition during the off-season by providing an opportunity for “gentlemen” to compete without being compelled to associate with professional runners (“Light and Dark Blue,” 1866). The following year, the AAC added the mechanic’s clause to its definition of amateur, thereby effectively excluding anyone who was “by trade or employment a mechanic, artisan, or laborer” (cf. “Argonaut,” 1886, p. 178).

This official bifurcation of presumptively “amateur” and “professional” contests had consequences for biomedical issues, as it was widely assumed that the physiology of a “gentleman” was more refined—and perhaps more delicate. Following the 1867 University Boat Race, the Lancet discussed dangers of dilation of the heart and aneurysm that might follow violent exertion. The London Times published physician F.C. Skey’s denouncement of the obsession with “death or victory” that such races purportedly fostered (cf. Whorton, 1982a). In an effort to quell escalating allegations of damage inflicted by athletic competition, John Morgan (a physician and former Oxford oarsman) located 255 men who had rowed in the prestigious race between 1829 and 1869 and sent them questionnaires. The majority of those who responded related that their youthful activity had improved, not impaired, their health. Morgan (1873) concluded that rowers lived about 2 years longer than did the “average” insured Englishman, and published his findings as University Oars.

The Clinical Society of London discussed Dr. Thomas Allbutt’s (1873) paper “On Overwork and Strain of the Heart and Aorta.” Drawing from autopsies and case studies, Allbutt had suggested that severe muscular effort might be a cause of heart disease. Commentary escalated. In a small volume entitled Exercise and Training: Their Effects Upon Health, Dr. R.J. Lee (1873), a Lecturer on Pathology at the Westminster Hospital, lamented the almost complete lack of information pertaining to “musculo-cardiac,” “pneumo-cardiac,” and metabolic function in relation to training and competition. Lee (1873) thereupon urged his colleagues to undertake the studies necessary to shed light on such matters (cf. Park, 1992a).

Over the next century, a growing number of investigators would heed Lee’s call. Some were motivated by an interest in improving athletic performance; far more were concerned about possible impaired health or were interested in scientific questions. Both the laboratory and the competitive contest served as experimental sites, although the latter presented particular difficulties in the matter of subject control. Boston physician E.H. Bradford (1877), who served part-time as a member of the Harvard Medical School faculty, looked into the health of men who had rowed in Harvard crews between 1852 and 1870 and found no greater incidence of hypertrophy, valvular disease, or consumption among rowers than any other former collegians. Dr. George Meylan, Director of the Gymnasium at Columbia University and the American Physical Education Association (APEA) president in 1907, subsequently made a more extensive investigation of Harvard men who had rowed between 1852 and 1892 and concluded that the evidence showed that in their postcompetitive years athletes were healthier than other men of their ages (Meylan, 1904). Other studies of varying scope and rigor ensued. P.H.S. Hartley and G.F. Llewellyn (1939) analyzed the records of men who had rowed in the Oxford–Cambridge Boat Race between 1829 and 1928 and concluded that intense physical activity had had no ill effects upon normal hearts.

Contributions of professional organizations, as well as those of individuals, have been important in advancing research in the health and exercise sciences. The
Federation Internationale Medico-Sportive (FIMS) was established by physicians from 11 nations during the 1928 Winter Olympic Games at St. Moritz. This was almost three decades before the founding of the British Association of Sport and Medicine, the American College of Sports Medicine, or any comparable organization in an English-speaking country. It is generally agreed that the first association of physicians interested in sports met at Oberhof, Thuringia, in 1912 (Hollmann, 1992; La Cava, 1956). Although space does not permit an examination of the reasons here why "sports medicine" as an identifiable specialty first appeared so much earlier around a largely German-speaking nexus, both the contexts in which science was pursued and ideologies concerning athletic competition were implicated.

FIMS quickly established a committee to plan the First International Congress of Sports Medicine, to take place 6 months later at the IX Olympiad at Amsterdam (Ryan, 1971). In fact, two types of "international congresses" were held in connection with the 1928 Amsterdam Games. Physicians, physiologists, and physical educators from Germany, France, Poland, the Netherlands, and 16 other countries collected anthropometric, heart and circulation, metabolism, respiration, and other physiological data from the assembled athletes (Buytendijk, 1929). An International Congress of Physical Education and Sport attended by over 300 amateur sports authorities, physicians, educators, and others was also held. This was devoted far more to theoretical and general presentations than to data-based presentations (Compte Rendu, n.d.).

The noted social scientist and authority on Olympism John MacAloon (1992) recently criticized the bifurcation of Olympic Scientific Congresses into a social science and a biomedical model following the initial International Olympic Committee (IOC) World Congress of Sport Science (WCSS) in 1989. In ignoring vital cultural and historical issues and events, MacAloon (1992) holds, the WCSS, which is "dominated by the natural sciences and their clinical applications" (p. 2), decreases one’s ability to understand the complexities of this complex worldwide phenomenon. In fact, such bifurcation existed 40 years earlier!

Track, another popular endurance activity, also has provided numerous opportunities to study metabolic, respiratory, and cardiovascular responses to intense physical activity. The American physician Austin Flint, Jr., (1878) analyzed food consumed and urine excreted by the famous pedestrian Edward Payson Weston in an attempt to determine the precise mechanics of metabolism. Drs. Harold Williams and Horace Arnold collected blood counts, pulse rates, urine samples, and heart data by means of percussion and palpation of men who participated in the 1899 Boston Marathon. Long-distance running, they concluded, was probably no more dangerous than any other strenuous exercise and was "far less injurious than other practices indulged in by exuberant young men" (Williams & Arnold, 1899, p. 1239). Drs. J.B. Blake and R.C. Larrabee (1903) found no evidence of permanent injury in men who had run in the 1900, 1901, and 1902 Boston Marathons. When American John Hayes was declared winner of the 1908 Olympic marathon following the disqualification of Italy's Dorando Pietri, interest in distance running escalated. The 1909 Pittsburgh marathon was arranged so as to enable former APEA President Dr. Watson Savage (1910) and others to collect data on a number of physiological parameters.

Debate over the medical aspects of athletics—and especially "athlete's heart"—waned and waxed. In 1911, Charles Stokes, surgeon general of the United States Navy, announced that nearly a third of Naval Academy athletes showed signs of disabilities or abnormal conditions (cf. Whorton, 1982a). The Medical Times,
Boston Medical and Surgical Journal, and other publications reacted with letters, editorial commentary, and rebuttals, much of which was directed at endorsing or denouncing athletic competition rather than advancing knowledge. In a paper prepared for an International Congress of Hygiene and Demography, R. Tait McKenzie, MD, Professor of Physical Education at the University of Pennsylvania, summarized the major debates and reported that his own investigations had located “mummers” in 27.8% of 266 students examined. Rather than viewing these findings with alarm, McKenzie (1913) doubted that severe athletic competition resulted in any appreciable damage. Coal mining, iron working, and other strenuous occupations (typically carried out under unsanitary conditions) were likely to be far more injurious. The time had come, McKenzie insisted, to reevaluate the whole question of the effects of exercise on the heart.

McKenzie certainly was not the only early physical educator who undertook investigations of the effects of intense physical activity on the individual. The number who engaged in experimental or clinical studies, however, was quite small; and it was likely to be someone who had medical training: for example George W. Fitz, MD, Harvard, 1890; James H. McCurdy, MD, New York University, 1893; Henry Beyer, MD and PhD, Johns Hopkins and a founding member of the American Physiological Society; McKenzie, MD, McGill University. Wilbur Bowen, C. Ward Crampton, MD, and MIT physiologist Theodore Hough might also be noted. William G. Anderson, MD, (founding President of the AAAPSE and Director of the Yale University Gymnasium) assisted Francis Benedict and Edward Cathcart (1913) with metabolic studies the two conducted during the early 1900s under the auspices of the Carnegie Institution of Washington. However, the preparation of the vast majority of early physical educators had not equipped them to engage in systematic laboratory research.

Such research, moreover, could be extremely costly and labor intensive. It was individuals like nutritionist W.O. Atwater and physiologist F.G. Benedict (1899) at the United States Department of Agriculture and the Carnegie Institution of Washington, or physiologist Yandell Henderson at Yale's Sheffield Scientific School—or in Britain, physiologists like A.V. Hill—who made the most important contributions during the first quarter of the 20th century. When A.V. Bock and David B. Dill prepared a revised edition of the British physiologist F.A. Bainbridge’s (1931) The Physiology of Muscular Exercise, a considerable amount of information had been gathered regarding the effects of exercise. Although it now was generally agreed that the phenomenon known as “athletic heart” was a fallacy, the only large-scale 20th-century study of athletics in relation to longevity had been Louis Dublin’s (1928) investigation of the life histories of 5,000 athletes at ten American colleges.

Physical Educators and Human Growth and Development Studies

Anthropometry was a major undertaking of turn-of-the-century American physical educators. Female, as well as male, directors of college departments of physical training collected large quantities of data. Taking surface measurements was often accompanied by a physical examination that included palpation, auscultation, and percussion in an effort to determine the condition of the heart. Information thus obtained was used to advise the student regarding “exercise and personal hygiene” (cf. Seaver, 1896).
Even before the AAAPE was founded, physical educators and those who would become associated with the field had contributed to human growth and development studies. While heredity, physical environment, nutritional status, freedom from infectious diseases, amounts of physical activity, and much more must be taken into account, such studies implicitly, if not explicitly, provide information about health. In 1873, the English biometrician Francis Galton (one of the first Honorary members of the AAAPE) had urged the newly formed Anthropological Institute to sponsor a project aimed at collecting height, weight, and other data from British school children (Boyd, 1980; Tanner, 1981). Galton was motivated by both an interest in science and the intense social Darwinist tendencies that swept Britain and America in the late 19th century. (He assumed that the data would show that the English were superior to other nationalities.) Across the Atlantic, Henry Pickering Bowditch (1872, 1891), Harvard Medical School Dean and Honorary AAAPE member, presented reports of his studies of the growth of children at meetings of the Boston Medical Society and the AAAPE.

In the early 1890s, Bowditch’s medical school colleague William T. Porter (1893, 1894) undertook extensive measurements of 33,500 St. Louis school children. From these, he developed percentile tables of rates of growth, relation between physical development and mental capacity, and a number of other measures. Speaking on the use of anthropometric measurements in schools at the 10th annual meeting of the AAAPE, Porter (1896) opened with the following observation:

The time in which we now live will always be memorable as the beginning of a great educational reform. It has seen the complete demonstration of a law which is causing a revolution in educational methods, the law that physical strength of the child and his power to do school work go hand in hand. (p. 158)

Plus ça change, plus la même chose! Porter’s (1896) message seems remarkably similar to the opening words of the Public Health Reports article “Healthy Children Ready to Learn” (Novello et al., 1992) referred to in the opening paragraph of this paper. At the same meetings, New York physician and early AAAPE member D.F. Lincoln (1896) summarized various domestic and foreign writings on growth and development, faulted their fragmentary nature and the unexamined assumptions upon which most were based, and stressed the need for longitudinal studies.

Studies proliferated in both number and scope over the next three decades, reaching 10,000 domestic and foreign sources dealing with some aspect of physical fitness of children by 1925. Staff of the Children’s Bureau of the U.S. Department of Labor (1927) thereupon prepared an extensive annotated bibliography entitled References of the Physical Growth and Development of the Normal Child. According to the Forward, “no single factor is of greater importance [than the physical fitness of children] in dealing with the health of nations” (U.S. Department of Labor, 1927, p. iii). (How much this sounds like the Reverend Livermore’s remarks a half century earlier.) Reviewers concluded that the vast number of existing studies of were “valueless or actually detrimental in effect, owing to faulty methods or improper application” (U.S. Department of Labor, 1927, p. iii). To encourage uniform and accurate methods of measurement and help eliminate unnecessary duplication, a team of eight women working under the direction of Dr. Ella Oppenheimer, Director of the Children’s Bureau’s Child-Hygiene Division selected and annotated 2,500 of the best books, monographs, and articles.
Given the repeated calls that have been made for uniform methods of investigation, accurate measures, and the like, Thomas Stephens’s (1987) observation in *Research Quarterly for Exercise and Sport* is especially striking: “Since no satisfactory definition of physical activity has ever been used even twice in comparable surveys, there is simply no reliable source for assessing [trends in physical activity] over time” (p. 94). It was in part to correct this situation, I assume, that Carl Casperson (1989) included a section on “definitions” in his review article “Physical Activity Epidemiology: Concepts, Methods, and Applications to Exercise Science.”

**Are Historical Epidemiological Reconstructions Possible?**

Casperson’s (1989) chapter in *Exercise and Sport Sciences Reviews* is, in large measure, an effort to elucidate the conceptual and methodological frameworks needed to conduct meaningful prospective studies of “physical activity as a health-related behavior” (p. 423). Might some of his operational categories be applied to retrospective studies?

Since the 1970s, a number of scholars have written on the history of illness and disease (cf. Porter, 1985; Riley, 1987; Wear, 1992; Webster, 1979). James C. Riley’s (1989) provocative *Sickness, Recovery and Death: A History and Forecast of Ill Health* makes judicious use of an array of statistical, demographic, medical, and other techniques to analyze such groups as a 17th-century Flemish printing firm, 18th- and 19th-century Scottish Friendly Societies, and the Bennett Street Sunday School Sick Society between 1816 and 1835. Many who have attempted such historical studies point to myriad conceptual and methodological difficulties. For one thing, before the advent of modern bacteriology, an individual was likely to die of infectious diseases before degenerative diseases became manifest. It also is often difficult, if not impossible, to determine from surviving records precisely the cause of illness or death.

Attempts to study health rather than disease in past societies may be even more conceptually and methodologically difficult. Nonetheless, some very useful efforts have recently come to the fore with the publication of works like *In Sickness and In Health: The British Experience, 1650–1850* (Porter & Porter, 1988) and *Crusaders for Fitness: The History of American Health Reformers* (Whorton, 1982b). Might it be possible to reconstruct physical activity patterns of selected past populations and relate these in any meaningful manner to at least some parameters of health? The first part of this puzzle is what was attempted in “Human Energy Expenditure from Australopithecus Afarensis to the Four-Minute Mile: Exemplars and Case Studies” (Park, 1992b).

Perhaps a few remarks about possible “case studies” that might serve as a stimulus to further action would be a fit way to conclude. Around AD 530, Benedict of Nursia issued “The Rule” by which all Benedictine monks were to conduct their lives. This specified the number of hours for prayer, work, sleeping, and eating in different seasons of the year. It also included, at least in a very general nature, information about the types of work that monks were to perform, the foods to be consumed, and suggested quantity (cf. Parry, 1984). From information such as this and various surviving accounts that monasteries kept, nutritionists have worked out probable caloric values of daily food rations (cf. Dembinska, 1986).

In a similar manner, owners of early 19th century factories set down the hours that men, women, and children were to work—typically 14 to 16 hours a day, 6
days a week. Surviving physical and literary evidence makes it possible to reenact the various tasks of the cotton-spinning industry. In 1832, Parliament launched an investigation of "the evils of the factory system" (Wing, 1837). The numbers, ages, and sex of those employed in the factories of Lancashire and Glasgow were tabulated; personal accounts of hours worked, effects of the work on health, illnesses suffered, and other information was obtained; and physicians were asked to testify about environmental and occupational hazard (Wing, 1837). Some factory owners housed apprentices, provided their meals, and arranged when needed for the services of a local physician (Nixon & Hill, 1986). Where these records exist, case studies might be possible.

Caribbean and American slave owners were likely to keep even more detailed records of the types and duration of the work they imposed upon men women and children held in bondage. From these it is possible to reconstruct at least baseline information about daily physical activity patterns (Higman, 1984; Ministre Secrétair d’Etat, 1844; Villiers, 1982). Records of foods supplied to slaves suggest a diet that was extremely deficient in proteins, minerals, and vitamins. Illnesses were also recorded (Higman, 1984; Kiple & King, 1981). However, difficulties encountered when attempting to identify chronic or endemic diseases—or even the cause of death in prominent epidemics—can be extremely problematic, as the papers that comprise *Science and Medicine in the Old South* (Numbers & Savitt, 1989) attest. Rather than finding these problems daunting, I find them a challenge, and I hope that some of the rest of you will as well. It is time that we historians contribute more broadly to the work upon which our field rests, and it is time that our colleagues in the biomedical and the physiological domains support and lend their expertise to good historical endeavors.

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**Notes**

1There have been seven names: Association for the Advancement of Physical Education (1885); American Association for the Advancement of Physical Education (1886–1902); American Physical Education Association (1903–1937); American Association for Health and Physical Education (1937–38); American Association for Health, Physical Education and Recreation (1938–1974); American Association for Health, Physical Education, Recreation and Dance (1974–1979); American Alliance for Health, Physical Education, Recreation and Dance (1979–present).

2Earlier conferences had been either state or local. Among the speakers at this first AAAE conference was Charles William Eliot, President of Harvard University, an advocate of healthful exercises for the general college population, and an implacable foe of what he believed were commercialized and extravagant commercialized intercollegiate athletic programs.

3The Lumleian Lectures were established in 1581 from a joint gift of Lord Lumley and Richard Caldwell, a Fellow of the Royal College of Physicians.