that he or she was ingesting. The opera singer Maria Callas is one person reputed to have followed this regimen. However, it is a dangerous approach to weight reduction, with many potential complications (Boese, 2006).

***Prolonged mastication*.** Horace Fletcher (1849-1919), nicknamed *"the great masticator,"*was an American health food proponent. He argued that food must be chewed at least 100 times before swallowing; and composed special songs to accompany his chewing. The process of mastication even extended to the ingestion of liquids, ensuring that they were well mixed with the saliva. In Fletcher's view, food should ideally be chewed until it disappeared entirely. Thus, he wrote: “*One-fifth of an ounce of the midway section of the young garden onion, sometimes called ‘challot,’ has required 722 mastications before disappearing through involuntary swallowing”* (Chrichton-Browne, 1910)*.* Fletcher claimed that with such thorough chewing, a person could subsist on half as much food. Some public institutions saw Fletcherism as a way of reducing food consumption and thus of saving money. Like the Grahamites (below), Fleucher favoured a low protein diet, and he saw mastication as a cure for his own obesity (Wolin and Petrelli, 2009), claiming thate he could subsist on 45 g/day of food by using this approach.

**Fig.** 39. Daniel Graham (1770-1809 CE, keeper of Leicester jail, who ultimately attained a weight of 335 kg. Source: https://en.wikipedia.org/wiki/Daniel\_Lambert

***Temperate food choices***.Sylvester Graham (1794-1851 CE) was a Connecticut Presbyterian minister, health reformer and temperance lecturer, best known for the "*Graham Cracker*." He probably formed his ideas in close contact with 2 other strong advocates of a vegetarian diet: the divine William Metcalfe (1788-1862 CE) and the physician and educator William Alcott (1798-1859 CE). The group believed that a vegetarian diet would, in essence, restore the idyll of the Garden of Eden (Graham, 1872). Graham condemned not only alcohol and beverages other than water, but also spices, condiments and meat, and also a sedentary life, as well as *"unnatural thing*s" such as "white" flour. As a fellow Grahamite, Alcott published a short satirical prayer (Wolin & Petrelli, 2009):

*"Give us this day our daily bread and cakes and pies besides,*

*To load the stomach, pain the head, And choke the vital tides*."

Graham specifically condemned the obesity of the Leicester jail-keeper Daniel Lambert (1770-1809 CE), who finally attained a weight of 355 kg (**Fig. 39**): *'In some rare instances.. the body continues to grow in bulk till it becomes an enormous and shapeless mass, as in the case of Daniel Lambert"*..."*all obesity or corpulence is a form of disease, and denotes a want of integrity in some functions of the system*" (Graham, 1872).

Graham gained fame when followers of his diet seemed to be spared during a cholera epidemic. However, this support faltered when Graham himself died at the the relatively young age of 57 years. Nevertheless, his ideas were perpetuated by the Battle Creek corn-flakes manufacturer William Keith Kellogg (1860-1951 CE) and his family.

***Electromagnetism and electroconvulsive therapy***. The discoveries of Benjamin Franklin led to a vogue for the electrical treatment of a variety of disorders, including obesity, Among the exponents of electrotherapeutic fads we may include James Graham (1745-1794 CE), Franz Anton Mesmer (1734-1815 CE) and John Wesley ((1703-1794 CE).

There have been occasional attempts to exploit exposure to strong magnetic fields, but there is no conclusive evidence that such exposure influences the course of obesity (Braschi, 2017). John Wesley used electroconvulsive therapy in an attempt to treat various medical disorders among his parishioners; however, they were mostly physical labourers, and there is no mention of treating obesity by this means. Nevertheless, there has been some subsequent evidence that electroconvulsive shock may help patients where obesity was secondary to a depressed mood state (Moss and Vaidya, 2006 ).

***Acupuncture***. The Chinese practice of acupuncture became popular in the Western world during the 20th century, and it has found its advocates for the treatment of obesity. Postulated mechanisms of action include a serotonin-induced enhancement of intestinal motility, a reduction of stress and depression via an increased secretion of endorphin and dopamine, and an endorphin-induced mobilization of body fat depots (Cabýoglu, Ergene, andTan, 2006).

***Sweat treatments***. Daniel G. Brinton, author of "*Personal Beauty"* developed a treatment for the morbidly obese based on the popular 19th century belief that fat was “only water” and thus could be driven out of the system by perspiration (Brinton and Napheys, 1870).

***Miraculous bath powders*.**The makers of *"*Healthone-obesity Bath Powder*"* claimed that a twice daily hot soak with their perfumed sodium carbonate bath powder quickly washed away obesity.

***Hydrotherapy and spa treatment***. A visit to a spa town such as Bath or Vichy was a common practice for over-weight Victorians. This typically involved periods of immersion in hot or cold springs, and the drinking of the mineral-rich water. Often, the spa provided sumptuous meals, which militated against any weight loss, but if facilities for strenuous exercise were also included, benefit was sometimes seen. The warm spa waters themselves commonly increased metabolism a little, and there was a little evidence that this had a positive effect upon obesity (Hazim et al., 2015 ; Mooventham and Nivethitha, 2014). Some authors have claimed that similar benefits can be obtained by wrapping a person in hot hay.

### *Homeopathy*. The idea of homeopathy was introduced by Samuel Hahnemann (1756-1843 CE) of Meissen, Germany. A homeopathic hospital opened at Leipzig in 1833, treating a variety of chronic ailments. Any benefits observed in obese patients were probably due to *"gravel pathways and spaces...where the patients might procure sufficient exercise and fresh air"* (Shephard, 2015)

**Public attitudes.** In early Victorian times, many people took an indulgent attitude towards those who were somewhat overweight, and sometimes they even despised those who very lean. Because chronic tuberculosis was widely present, plumpness was seen as evidence of good health. But perhaps in part as an expression of "*muscular Christianity*" (Shephard, 2015),during the latter part of the Victorian era, many people became strident in their condemnation of the obese; there was fierce satire, and some claimed associations between obesity and a low level of intellect or a propensity for prostitution and other types of criminalactivity. Nevertheless, plumpness remained better tolerated among a "Bohemian" coterie of authors and actors.

***Early tolerance of obesity*.** Health and beauty authors such as the American writer Daniel Brinton (1837-1899 CE) were indulgent towards those who were overweight, and despised those who were very lean (Brinton and Napheys, 1870). Brinton wrote: a “scrawny bony figure” is *“intolerable to gods and men.*" *“The only lady who we ever heard derived advantage from such an appearance (leanness) was Madame Ida Pfeiffer.  She relates that somewhere in her African travels the natives had a mind to kill and eat her, but she looked so unpalatably lean and tough that the temptation was not strong enough, and thus her life was saved.”*

An unidentified correspondent of the Washington Post described politician Daniel Webster (1782-1852 CE) as *"broad in body as well as in mind,"* and noted that former President Grover Cleveland and Secretary William Taft both had *"corpulence and brains"* (Segrave, 2008).

Charles Dickens (1812-1870 CE) created one of the most well-known of obese characters, the fat boy in the "*Pickwick Papers*," a character who consumed great quantities of food and was substantially affected by sleep apnoea, continually dozing off throughout the day (**Fig. 40**). But in the same book Tony Weller, the cockney father of Mr. Pickwick's man-servant opined approvingly: *"Vidth and Visdom go together."*

Louisa Alcott (1833-1888 CE) apparently had no problem with the plumpness of young women. In “Little Women," Margaret, the eldest of the four girls, was said to be "*sixteen and very pretty, being plump and fair, with large eyes, plenty of soft brown hair, a sweet mouth, and white hands, of which she was rather vain. …"* (Alcott, 1880)

**Fig. 40**. The fat boy from the Pickwick Papers. Source: https://www.google.ca/search?q=Fat+boy+from+Pickwick

Pickwick.tiff

***Later disapproval of obesity***. Later during the nineteenth century, many people no longer saw plumpness as synonymous with health and beauty.  Indeed, they began to view excess weight as a sign that a woman was inconsiderate, stupid, lazy, and—in some cases—even promiscuous or insane. The stereotype was reinforced by some overweight characters who were featured as dim-witted and lazy in popular plays and novels. An 1893 edition of Charles Dickens’ weekly literary magazine "All the Year Round" addressed this issue (Dickens, 1893), with the brief commentary accompanied by an advertisement for F.C. Russell's remedy for obesity (above). In a section headed "*Home Notes,*" the magazine stated: “People have rather an erroneous idea, probably gathered from Dickens’s Fat Boy in ‘Pickwick,’ that corpulent people have none of the finer feelings and are of a lethargic and dull comprehension.  This is altogether a mistake, as many a poor corpulent lady can tell you.  When she ascends a crowded omnibus on a hot summer’s day every one of the indignant glances levelled at her by her more fortunate sisters are as so many little dagger thrusts of mortification, though her ruddy complexion and defiant stentorian breathing may seem to belie the truth of these words.”

On the other hand, bitingly adverse comments on the obese appeared in books such as "The Body Beautiful" (Fletcher, 1901). “All defects are in the nature of ugliness, but certain ones are more degrading than others; and of these obesity, which is a deformity, is signally ignoble.” “Wherever the fat woman finds herself in a crowd—and where can she avoid it in the metropolis?—she is in effect an intruder.  For, she occupies twice the space to which she is entitled, and inflicts upon her companions, through every one of her excessive pounds, just so much additional fatigue and discomfort.  Too often, this so redundant flesh seems to serve as a bullet-proof armor, repelling all consciousness of the rights of others.  The woman who makes a god of her stomach is incorrigible, and I fear no word of mine will avail to induce her to reform.  She is the innately selfish woman who makes her very existence an offense.” At one point, Fletcher acknowledged that “corpulency” was a disease.  However, this did not stop her from accusing obese women of “*indolence of mind*” and categorizing overeaters as a lower order of beast.

Horse.tiff

**Fig. 41.** A mocking Parisian illustration by Crafty shows a heavy woman being helped onto her horse. Source: http://www.biodiversitylibrary.org/bibliography/29409#/summary

Satirical comment on the obese is well exemplified by Victor Géruzez (1840-1906 CE) a French author and illustrator who worked under the pseudonym of "Crafty"). His drawings mocked the pear-shaped bellies of authority figures. An illustration in *Paris à Cheval* from 1884 (Géruzez, 1884) shows a heavy female rider being lifted with difficulty into the saddle. The helper has his hands full, literally, and the caption reads, “*One of the thousand reasons why women over fifty kilos should give up horseback riding*” (**Fig. 41**). Géruzez further argued that it was unreasonable to expect a 14-15 kg bicycle to support a person who weighed more than 70 kg (Vigarello, 2013).

Numerous Victorians looked for abnormalities in the anthropometry of prostitutes, including du Chatelet (1836), Salsotto (1889) and Tarnowsky (1889), often claiming a linkage between obesity and immoral living. du Chatelet (1836) commented on prostitutes: it *"strikes those who look at them en masse..." "this obesity only begins at the age of 25 to 30 years" "a simple explanation lies in the great number of hot baths to which these women are accustomed to take throughout the year, and above all to their inactive lives and abundant nourishment."* However, the data supporting these ideas is suspect. Body mass indices calculated from the height and weight data of Salsotto (1889) yield averages of 22.9 kg/m2 for prostitutes and 23.8 k/m2 for "moral" women. Tarnowsky commented further that although 19% of prostitutes were below normal weight, they were also shorter than "moral" women (Tarnowsky, 1889). The forensic pathologist Cesare Lombroso was particularly vociferous in his viewpoint concerning the body build of miscreants. The book "*The Female Offender*" (Lombroso & Ferrero, 1895) compared the published anthropometric data of Fornasari for prostitutes and slimmer "moral" women, arguing that: “This greater weight among prostitutes is confirmed by the notorious fact of the obesity of those who grow old in their vile trade, and who gradually become positive monsters of adipose tissue." He claimed that 59% of prostitutes were above average weight, and some reached values in the range 90-130 kg. Taking his analysis a step further, Lombroso looked for similar traits among women committed to insane asylums, writing: “In conclusion, I would remark that in prisons and asylums for the insane, the female lunatics are far more often exaggeratedly fat than the men.”

However, the actual data cited by Lombroso do not bear out his claims (**Table 3**). Calculating the body mass index for prostitutes and "moral women," the respective averages are 22.3 and 22.1 kg/m2. Moreover, only one woman in each of the two categories is slightly overweight. Further, any search for systematic differences in body mass would have been complicated by the large doses of mercury that many prostitutes of the Victorian period ingested as a prophylactic against venereal diseases.

**Table 3**. A comparison of heights and weights between prostitutes and "moral" women published by Cesare Lonroso (Lombroso & Ferrero, 1895).The body mass indices for the 2 categories of women have been calculated by the present author.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Prostitutes | | | "Moral" women | | |
| Age (yr) | Height (m) | Weight (kg), BMI (kg/m2) | Age (yr) | Height (m) | Weight (kg), BMI (kg/m2) |
| 27 | 1.445 | 44.3 (21.2) | 15 | 1.445 | 42.0 (20.1) |
| 22 | 1.415 | 45.0 (22.4) | 31 | 1.50 | 43.0 (19.1) |
| 24 | 1.523 | 48.15 (20.8) | 25 | 1.54 | 47.5 (20.0) |
| 24 | 1.510 | 48.2 (21.1) | 26 | 1.45 | 48.0 (22.8) |
| 22 | 1.604 | 52 (20.2) | 30 | 1.544 | 51.5 (21.6) |
| 24 | 1.58 | 52 (20.8) | 22 | 1.40 | 52.4 (26.7) |
| 26 | 1.50 | 58 (25.8) | 19 | 1.50 | 55.2 (24.5) |
| 20 | 1.584 | 59 (23.5) |  |  |  |
| 30 | 1.690 | 67 (23.5) |  |  |  |

Probably in response to these theories, Guy de Maupassant (1850-1893 CE) entitled a prostitute in his first story about the Franco-Prussian war *"Boule de Suif "("Ball of Fat"*)(Maupassant, 2014).

The idea that obesity was incompatible with intelligence and mental acuity also became widespreadin late Victorian times*.*  As the 1900 edition of the Dietetic and Hygienic Gazette reported: “Obesity always carries with it physical and often mental weakness, and is in excess always a disease…” (Keatinge, 1900)

***The Bohemian contingent.*** In a book entitled "*Modern Paris,*" originally published in 1923, Robert Sherard (2009) suggested a link between obesity and literary genius, listing Balzac, Dumas, Rossini, Victor Hugo, and Sainte Beuve among a long list of fat and jolly authors.

Honoré de Balzac (1799-1850 CE) was particularly interested in the impact of obesity upon gait, as can be seen in many of his books. In "*The Vicar of Tours*," he described the walk of an old maid: *“…her movements were not equally distributed over her whole person, as they are in other women, producing those graceful undulations which are so attractive. She moved, so to speak, in a single block, seeming to advance at each step like the statue of the Commendatore.” “While it is true that dignity, in the sense of majesty, requires a certain fullness of flesh, it is nonetheless impossible to claim this to be true of a man walking, since his belly throws the rest of his body off balance. Walking ability disappears with obesity. An obese man finds himself forced to surrender to the ungainly movements imposed on him by his rotund belly… ”*

Alexandre Dumas (1802-1870 CE) seemed to blame his obesity on the heavens. He had Chicot complain in "*Chicot the Jester*": "*Because the Lord in His anger has struck me with****obesity****, and I could not pass where the others did*." The physician and philosopher William James (1842-1910 CE) once described a female acquaintance: "*We found the old girl herself, a type for Alexandre Dumas, obese, jolly, wicked, intellectual, with no end of go*" (James, 2008).

**Fig. 42.** Rossini. Source:https://sites.psu.edu/mckenzie/2016/05/25/composer-profile-gioachino-rossini-2/

Rossini.tiff

Emile Zola (1840-1902 CE) is said to have written best when he was very fat, and when his bulk diminished, so did his talents.

The Russian novelist Ivan Turgenev (1818-1883 CE) wrote of "*strong men and monsters of obesity...the deacon who ate no less than thirty-three herrings for a wager...Ezyedinov, renowned for his corpulence.. a peasant woman who at her death weighed half a ton and some pounds.*.." (Turgenev, 2013).

Gioachino Rossini (1792-1868 CE) had a love of food shown not only by his ever-expanding waistline (**Fig. 42**), but also by the number of dishes that were named after him. Other musicians also were quite obese, including Handel, Sibelius and Stravinsky.

The American actress and singer Lillian Russell (1860-1922 CE) was one of the reigning sex symbols of Victorian England, and her photos were prominent in many newspapers. By the turn of the 20th century, her weight was reputed to be in excess of 90 kg **(Fig . 43**), but her popularity continued, and she remained busy writing articles on health and beauty.

***Conclusions***. During the Victorian era, the quantification of obesity began, with the calculation of weight to height ratios, and physicians advocated increasingly rational treatments of fat accumulation. But at the same time, the public was attracted to a multiplicity of widely advertised but ineffective and sometimes dangerous remedies. Early in Victorian times, many of the public saw plumpness as a manifestation of good health, but later opinion shifted to satirical and moral condemnation, with obesity linked to a low level of intelligence and various manifestations of immoral behaviour, including prostitution. Nevertheless, a tolerance of overweight persisted among the Bohemian company of actors, authors and musicians.

**Discussion**

The answer to the question posed at the beginning of this historical review seems that in fact there have always been at least a few obese individuals in settled communities from the earliest points in the history of humankind. This suggests that the body's capacity to store nutrients in excess of immediate metabolic needs may have been a factor in evolutionary selection (Kopelman, Caterson, and Dietz, 2005; Prum, 2017). When facilities for external food storage were limited, stores of body fat could have offered a valuable protection against times of famine, and provided the added energy needed to sustain pregnancy and lactation.

Russell.tiff**Fig. 43**. The Victorian actress Lillian Russell, who attained a weight of over 90 kg. Source: https://en.wikipedia.org/wiki/Lillian\_Russell#Later\_years

The prevalence of obesity seems to have increased steadily over the millennia, despite edicts of the church against gluttony, health warnings from physicians, public criticism, employment sanctions and biting satire. Initially, the problem of excess body weight was limited to the rulers and a few of their relatively sedentary servants, but obesity has spread progressively throughout the various strata of society, with this trend speeded by emergence of a middle class boasting leisure time, surplus income, and a desire to demonstrate their good health and prosperity through a large paunch.

The epidemic of obesity affecting all social classes has been a new feature of the late twentieth century(Deurenberg-Yap & Sediell, 2003; Flegal, Carroll, & Kuczmarski, 1998; World Health, 2014). Various factors have probably contributed to this phenomenon (McAlister, Dhurandhar, & Keith, 2009); correlates include an ever-decreasing need for physical activity in daily life (Brownson, Boehmer, & Luke, 2005; Church, Thomas, & Tudor-Locke, 2011), a growing limitation of opportunities for voluntary physical activity as mega-cities have grown in size and population density (Fan et al., 2017; Lake & Townshend, 2006), and deliberate attempts by some food manufacturers to encourage the over-eating of unhealthy pre-packaged food (Ledikwe et al., 2005; Livingstone and Pourshahldi, 2014).

It is interesting to speculate how far a change in public attitudes may have been a further contributing factor. Obesity has apparently evolved from a condition that in the Victorian era provoked public disapproval, satire, and even denial of employment, to become almost an accepted feature of modern life in North America. U.S. surveys by the consumer research firm NPD found that over a 20-year period, the proportion of people finding overweight individuals as unattractive dropped from 55% to 24% (Associated Press, 2006). In some countries, commercial airlines are now required by law to provide obese clients with a second seat at no additional charge. Many people fail to recognize that they are overweight, and have only a limited knowledge of the health risks that their excess body fat imposes. Moreover, obesity is regarded as a problem for physicians and affected individuals rather than society as a whole (Curtice, 2016). In all, an excessive body mass is now regarded as an unfortunate medical condition for which the affected individual bears no personal responsibility. Admittedly, there are rare instances where some hormonal abnormality is responsible for an excessive body weight, but for most people the causes are over-eating and a lack of adequate habitual physical activity; sympathetic medicalization rather than a challenge to greater self-discipline could well have played a role in encouraging the obesity epidemic.

**General Conclusions**

With the probable exception of hunter-gatherer communities, there is evidence that at least a few obese individuals were living in most settled communities from early in the story of humankind. This brief historical survey points towards a growing prevalence of obesity as an economic surplus allowed emergence of a ruling class with no imperative to engage in vigorous physical activity, a body of artisans who engaged in sedentary work to manufacture the luxury trinkets demanded by high society, and the growth of a middle class with the means to purchase food in excess of their immediate survival needs. Almost all of the available evidence points to causation by a level of habitual physical activity that is inadequate to match the individual's food intake. Moreover, the adoption of regular vigorous exercise and a moderation of diet have been recognized as effective remedies for obesity throughout most of history. The growing prevalence of excessive accumulations of body fat, and public acceptance of this phenomenon seem new features of the late twentieth century. Potential causes include an ever-decreasing necessity for physical activity during daily life, limited opportunities for active leisure in mega-cities, deliberate attempts by food manufacturers to promote over-eating, and (particularly in the U.S.) a growing public acceptance of obesity.

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