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# The Apparition of Fat in Western Nutritional Theory

*Ken Albala*

When evaluating any dietary system it is important to be clear about what exactly it aims to achieve, and the very definition of health is determined by any given culture's values or what it considers to be the Good. Our own science of nutrition, despite its claim to offer objective truth, is designed first and foremost to prevent a few diseases – heart disease especially, and to promote longevity. It would be a mistake, however to assume that its strictures are universally valid moral imperatives. And clearly individuals' actual dietary practices show that consuming as many ice cream sundaes as possible in one lifetime can be construed as a greater good than avoiding heart surgery or premature death. Naturally dietary systems of the past had different goals in mind when framing their recommendations. They had different conceptions of the good, and at some point in history that came to include not being fat. Body size then became an official concern for dietary writers. Whether the original impetus for this change was a matter of fashion, spirituality or has its roots in a different approach to science is impossible to say with any degree of precision. But this paper will argue that nutritional science itself as reformulated in the 17th century was largely to blame for the introduction of fat into the discourse about how health should be defined.

It should go without saying that different cultures in time and place have had different perceptions of ideal body size. We know that most people on earth have not had this intense stigma attached to obesity and in fact among less affluent societies fat was seen as a sign of wealth if not health. Our own thin ideal could only be possible in the midst of abundance and only with active promotion by the media and business interests hoping to cash in on our obsession with avoiding fat. And as much as we may lament the unfortunate consequences of this ideal, we still insist that this is really a health issue. Being too thin might be unhealthy, but is at least fashionable. Being too fat is socially repellant and dangerous. It is

not merely a matter of looking good; we accept this as a scientific fact. Obesity is a pathological state according to modern nutritional science. But it was not always so.

When and why fat became a medical issue has been a topic of concern among contemporary scholars. Some studies, such as Peter N. Sterns' *Fat History: Bodies and Beauty in the Modern West*, place the origin of our modern obsession in the late 19th century when the rise of nutritional science and health movements led by figures like John Harvey Kellogg, hand in hand with modern advertising and Gibson Girls, swept away the Victorian preference for fulsome figures. As a form of social protest, those who could afford to, much as in the 60s, idealized the slim androgynous figure we associate with flappers. Others push the origin further back into the early 19th century, in the age of Muscular Christianity and Sylvester Graham. But clearly the obsession is earlier than this. In the 18th century the 448 pound physician George Cheyne and his miracle dieting had people flocking to try out the latest 'cures.' It was at the same time that dissertations on the topic of obesity became popular, and clearly the medical profession had classified this as a treatable condition. And readers had already been trained to monitor and police their own bodies for signs of impending corpulence. The roots of this fear and guilt must lie somewhere in the previous century as nutritional science was still groping its way through a myriad of chemical and mechanical theories attempting to quantify health and nutrition with empirical research.

The 17th century is also the ideal place to look if only because the earlier system of humoral physiology is almost totally devoid of a concept of fat as a sickness. There were some recommendations designed to help people lose or gain weight. Even in the ancient world, the Hippocratic authors thought that it is better to be a little thin rather than a little fat, but Aphorism five also states that it is better to eat a little too much than to follow a strict and precise diet<sup>1</sup>. Galen actually composed a 'thinning diet' but this was designed more as a therapeutic regimen to thin the humors in the body than a weight loss program<sup>2</sup>. As a rule this was simply not a major concern among early dietary writers. Gluttony was, of course, another matter and had always been stressed as a health issue. Eating and drinking too much, too great a diversity of food, without any order or at the proper times, was considered the source of innumerable diseases. But revealingly, obesity was not among them. Oddly enough, most nutrition writers believed that gluttons were poorly nourished, their systems being tossed into such a state of

disarray that little food would be properly processed. The surfeit of food in a sense overloads and extinguishes the heat which facilitates digestion.

Even among theologians, the sin of gluttony was more closely related to greed and lust than any kind of personal defilement, because it involved eating too much while others went hungry. Most exegesis focused on the glutton in Luke (16.19-31) whose real sin was not stuffing himself silly, but neglecting to perform acts of charity, which then made his sin mortal – which is why he later fasted in hell. Fat itself was not conceptually linked to gluttony, even though in the popular consciousness, and especially in contemporary depictions gluttons are pictured as fat. Hieronymus Bosch's depiction of Gluttony is one good example. Another is Ben Jonson's Hymn to the Belly: 'Hail, hail, plump paunch! O the founder of taste, For fresh meats or powdered, or pickle, or paste! Devourer of broiled, baked, roasted or sod! And emptier of cups, be they even or odd! All which have now made thee so wide I' the waist, As scarce with no pudding thou art to be laced...'³ Eating too much might make you fat, but fat itself was no sin. Not yet.

Gaspard Bachot writing in the early 17th century is among the few physicians in the Galenic tradition who even broach the topic, and his advice is both for those who want to become thin as well as those who want to become fat. For the latter he suggested not exercising, eating rich meats and fatty soups, drinking a lot, sleeping long hours and not studying too much.<sup>4</sup> Undergraduates must still be heeding his advice. To be fair, Bachot did consider the ideal body size to be neither too fat nor too thin, or what he called being 'en-bon-point.' But then as today, embonpoint implied a stout figure. He also conceded that women are generally fatter than men because of their colder constitutions, and fat tends to congeal around the stomach because it is further from the source of vital heat and gets less exercise than the extremities. And of course those who 'vivent à gogo' and overindulge become fat.<sup>5</sup> But he disagrees with Aristotle that fat is always the result of personal habits; he believed there is also a natural fatness to which individuals with certain constitutions are prone – especially the phlegmatic and sanguine. Some people are naturally fat regardless of how much they eat, and he even relates a story of one man who became sick on a crash diet, failed to lose weight and in the end died.<sup>6</sup>

On the topic of fat as a sickness, Bachot goes no further than to say that fat people tend to have shorter lives because the constriction of their veins prevents the flow of blood and spirits which hastens old age. The fat also tends to suffocate

the vital heat, pressing on the veins and arteries and causing shortness of breath.<sup>7</sup> This is one of the earliest hints that physicians were beginning to consider excessive fat an actual threat to health, and offer corrective regimens.

Other writers in the early 17th century offer little more, apart from perhaps a brief anecdote such as Tobias Venner's when he remarks that biscuit is good for phlegmatic people and those 'that desire to grow leane.'<sup>8</sup> For all authors in the Galenic tradition it appears that fat was seen as a natural consequence of a complexion tending to the cold and moist, something which could be corrected, but not considered an illness that demanded serious attention. And socially there does not seem to have been any specific stigma attached to fat if Rubens' taste in flesh is any measure.

The issue of fat really only emerges among authors who have abandoned, in part or totally, the system of humoral physiology. This seems to have something to do with both the new attempts to quantify nutrition, first and most famously by Santorio Santorio<sup>9</sup> and also among those who began to see digestion and nutrition as chemical reactions which when gone awry cast fatty deposits throughout the body. It was only then that fat came to be considered a kind of sickness to be treated with therapy.<sup>10</sup>

The earliest indications that fat was beginning to be seen as a medical problem are found in the work of the first dietary writer who systematically weighed himself. Although Santorio does not seem to have been anxious about being overweight himself, he did consistently define health as the maintenance of body weight. Expanding on the rather vague concept of insensible perspiration used by Galenic authors, Santorio sought to precisely measure the amount of food he consumed each day compared to the amount excreted in 'sensible' evacuations. The latter were always noticeably less than the former, and he thus concluded that 'insensible' perspiration through the skin and via the breath accounted for an even greater proportion of bodily waste. If a healthy man, for example, consumed 8 pounds of food in one day, a full 5 pounds would be excreted through insensible means. 'Health continues firm as long as the body returns daily to the same weight by insensible perspiration...'<sup>11</sup> This was a sign that the body had properly refined and assimilated the nutritive matter of food and drink. An excess of perspiration indicated that the body was beginning to waste away, too little was a sign that crude deposits were being left in the body. Still, fat was not a matter of eating too much. 'He who eats more than he can digest, is nourished less than he ought to

be, and [becomes] consequently emaciated.’<sup>12</sup> More importantly, fat was a sign of a system in disarray.

Drawing on Santorio’s ideas Walter Charleton sought to explain the physiological differences between fat and thin bodies. The volume of blood was thought to be a crucial factor, and it was a generally accepted fact that thin people have more blood than fat ones. He uses this idea to defend his position that blood is not what nourishes the body, as earlier schools believed. ‘Men that are fat and plump, have but little blood; and such as are spare and lean, have abundance: which could not be, if blood were matter of nourishment.’ And, paradoxically, he contends that ‘in a gross body, where are more parts to be nourished, there ought to be more blood to nourish them: but grosse men, for the most part, eat much lesse, than lean; because they have lesse veins, and being inclined to sedentary and unactive lives, they consume but few spirits.’<sup>13</sup> That is, according to his theory that the nerves actually transport highly refined, fermented and distilled nutrients throughout the body, fatter people need less food because their nerves are large, moist, open and spongy, which means that nourishment is distributed and assimilated much more easily. Charleton was clearly pulling ideas out of thin air, rather than conducting experiments, but the late 17th and early 18th century physicians would subject Santorio’s ideas to rigorous scrutiny.

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In fact, by the next generation Santorio was being hailed as the founder of a whole new understanding of the physiology of the body as a machine. As the first historian of nutritional science, James Mackenzie, writing in the 1750’s put it, ‘He opened a whole new scene in physic, to which physicians and philosophers were in a great measure strangers before this time; and, upon experiments made with amazing diligence and assiduity for thirty years, has established the laws of insensible perspiration.’<sup>14</sup> In other words, in discovering a way to quantify metabolic activity, body weight became a medical issue in a way it never had been before. Being overweight was now a sign that something had gone wrong with the body.

Food was not in fact the only factor Santorio or his followers took into account though. As before, the amount of exercise one gets, baths, air quality, even emotions could alter the metabolic rate. But now, the effect of all these could be precisely calculated. According to Mackenzie others followed up Santorio’s experiments in different climates: Dodart in France starting in 1668, James Keil in Britain in 1718, De Garter in Holland in the 1720s and even one Dr John Linen

in Charleston, South Carolina in the 40s.<sup>15</sup> As with Santorio, health was still defined as maintaining weight, replacing the parts of the body consumed in daily activity and eliminating any excess.

Conversely, therapeutic regimens could now be prescribed to stimulate the rate and quantity of insensible perspiration when it was deemed defective. As the most influential physician of the era, Hermann Boerhaave, put it, the various form of perspiration can be stimulated. 'They are made, maintained, increased and restored when one has robust organs, vessels and muscle fibers; with movement of the body exercised just until a light sweat begins; a moderate use of sex reviving your body to a healthy strength, but not inciting cares of the mind; sleeping seven or eight hours with the body well sheltered, but not burdened with excessive weight of bedding, makes you moderately happy; pleasing food that is solid, light, fermented, not too fatty, seasoned with aromatics; pure air that is serene, dry, weighty and cold.'<sup>16</sup> The aim here was not to overheat the body, which would cause excessive flux, but to keep it moderately heated so the machine runs smoothly.

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At the same time that these mechanistic conceptions of nutrition became mainstream, a chemical understanding of how food is broken down by means of acids and alkalis also came to be accepted by the medical profession. These ideas ultimately harked back to Paracelsus writing in the 16th century but were elaborated upon by 17th century writers such as van Helmont and Sylvius de la Boë. Some authors regarded digestion as a species of fermentation, while others insisted that food was merely refined, broken down by chemicals and then mixed into the bloodstream through respiration. Oddly enough, this demanded that the lungs now be classed as a digestive organ, because they facilitate the very last stage of refinement before nutrients can be assimilated into the parts of the body that have been spent. Hand in hand with the concept of insensible perspiration, this idea of refinement provided another explanation for why some people become fat. The food in their bodies remains in its crude state, clogs the tiniest vessels and congeals there as fatty deposits.

Drawing on these ideas, the popular nutrition author Louis Lemery, posited that thin people have naturally hotter systems. This idea was standard in Galenic medicine. What is new is that this makes the refinement of nutrients in their bodies more thorough because the fermentation has greater vigor. This prevents fat from forming. This explains why thin people generally have more blood than fat people.

For the latter, their colder systems leave a larger proportion of unconverted chyle containing gluey nutrients that more easily replace the solid parts and fill the empty spaces in the body. The difference lies in the degree of attenuation or refinement of the blood.<sup>17</sup> It is clear that by the early 18th century fat could be seen as a physiological defect that could be corrected by heating the body to facilitate digestive fermentation and the passage of insensible perspiration.

How this heating was to be accomplished is itself fascinating. Moderate exercise makes enough sense from a purely empirical point of view. But physicians like John Arbuthnot also recommended stimulating and piquant substances like mustard, radishes, garlic, onions and leeks as well as spices and aromatic plants like saffron for his patients who needed to lose weight. Highly seasoned meats with a lot of salt, pepper, and vinegar are also useful for dissolving fat in the body. The only disadvantage of these is that they increase thirst and an abundance of liquids only makes the malady worse. But anything that could heat up and speed the refinement of nutrients and the passage of perspiration would be useful – including wine, coffee and tea.<sup>18</sup> Significantly, Arbuthnot also recommends to his overweight readers that they avoid oily foods and fats, not because these cause fat directly, but because they impede the transit of waste products which then causes fat. In and of themselves they are nourishing and necessary for the lubrication of the machine,<sup>19</sup> but only in the body strong and hot enough to process them. Although the theories themselves are obviously nothing like our own, we are much closer to the idea of fat as a medical condition.

Along the same lines, Arbuthnot's friend, the infamous George Cheyne, offered similar advice for 'The Unwieldy, Fat and Overgrown.' Simply enough, it was avoiding drinks of all kinds, not merely liquor, but even water. In his mind, liquid dilutes the refinement process, cools the entire body and impedes the passage of wastes. 'No one rule or condition, ever was contrived, or can be, of so great use, to preserve and lengthen the lives of such, as an obstinate and universal abstinence from all kinds of liquors.'<sup>20</sup> Where Cheyne departs from conventional medical opinion, is in his recommendation of a cooked vegetable diet to counter the affects of a disordered system, which he admits is rooted in his own 'experience and observation on my own crazy carcase and the infirmities of others I have treated' rather than on any theoretical foundation.

The controversy over whether vegetables could be considered a proper diet, not only for the sick or overgrown but for healthy individuals, was of great concern

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in the 18th century. Nicholas Andry in his *Traité des alimens de caresme* offered an extended diatribe against the very notion that vegetables could sustain life, a question of particular importance in Catholic France where Lenten restriction were still in force, at least officially. Specifically, he was attacking a work by one P. Hecquet, the *Traité des dispenses du careme*, which claimed extensive health benefits for vegetarians. The importance of the work for the topic of fat, is that Andry argues that a vegetable diet is not suitable for weight loss, because watery foods prevent proper fermentation of aliments and the transpiration of wastes. Like Cheyne, he also pointed out the dangers of drinking water. 'Health is maintained principally by transpiration, and transpiration depends principally on the force ... of the solids which push the fluids; so that if the solids are too loose, the oscillating movement by means of which they chase the liquids, is consequently too weak, resulting in an imperfect transpiration... Pure water and all watery nourishment, when used in excess, relax in the end, the tissues of the parts of our bodies, and they prevent fermentation.'<sup>21</sup> According to current medical theory, vegetables could not be suitable for weight loss, despite the successful results of the empirics.

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Cheyne, writing after Andry, argued differently. He reasoned that vegetables because composed of small particles loosely packed can be easily broken down and transported through the body. The flesh of young animals is also acceptable if necessary. Both facilitate circulation, prevent the clogs, and their wastes are easily evacuated through perspiration. Older animals and matured fruits he believed have more compact and dense salts which makes them more difficult to digest. Equally fat is difficult to digest. 'Oily and fat substances elude the force and action of the concoctive powers; and their parts attract one another, and unite more strongly than other substances do, except salts...'<sup>22</sup> Unlike Arbuthnot, he also recommends soft, insipid foods over aromatic, hot and pungent ones. Even cookery itself is suspect; it is best to trust only 'plain roasting and boiling' rather than 'rich soop, high sauces, baking, smoaking, salting and pickling' which only incite one to overeat.<sup>23</sup>

It is clear that authors had a number of potentially conflicting theoretical models to draw from and both mechanical and chemical explanations could be used to explain why fat accumulates in the body. Yet with entirely different conceptual tools, these authors arrived at dietary goals surprisingly like our own, and equally as contentious. The ultimate goals now became avoiding disease and

fat, and living a long life. While it would be difficult to prove that these dietary authors had any major impact beyond the wealthy elites and professionals who read their works, it is clear that a concern over fat was firmly in place by the mid 18th century, and appears to have its roots in a new conception of physiology which not only paid close attention to body weight as an index of health, but increasingly saw fat as a medical condition.

## Notes

1. "In a restricted regimen the patient makes mistakes, and thereby suffers more; for everything that occurs is more serious than with a slightly more liberal regimen. For this reason in health too an established regimen that is rigidly restricted is treacherous, because mistakes are hardly borne. For this reason, therefore, a rigidly restricted regimen is treacherous generally as compared with one a little more liberal." Hippocrates vol. 4, tr. W.H.S. Jones. Cambridge, MA: Harvard University Press, 1967, p. 103.
2. Galen, *Selected Works*, tr. P.N. Singer (Oxford: Oxford University Press, 1997), 305 – 324.
3. Ben Jonson, 'Hymn to the Belly' in *Gluttony*, ed. John Miller and Benedict Cosgove (San Francisco: Chronicle Books, 1996), 73-74.
4. Gaspard Bachot, *Erreurs populaires touchant la medecine et regime de santé* (Lyon: Barthelemy Vincent, 1626), 203 and 405.
5. Bachot, 394-419 passim.
6. Bachot, 402.
7. Bachot, 419.
8. Tobias Venner, *Via recta ad vitam longam* (London: Edward Griffen for Richard Moore, 1620), 23
9. Hillel Schwartz begins his study of the dieting obsession with Luigi Cornaro, the miracle self-cure guru of the 16th century and Santorio and his famous weighing chair. As he admits though, fat was not a particular concern of either writer. He believes that the act of self-scrutiny, observing one's body constantly has its origin here, leading ultimately to weight-watching. His study focuses on the American experience of dieting though. Hillel Schwartz, *Never Satisfied: A Cultural History of Diets, Fantasies and Fat* (NY: Anchor Doubleday, 1986), pp. 9-12.
10. This idea, or more specifically that the rationalization of diet has its origins in the mechanistic conceptions of the body was first suggested by Bryan S. Turner in 'The government of the body: medical regimens and the rationalization of diet' in *The British Journal of Sociology* Vol 33 #2 June 1982. But his examination is concerned primarily with George Cheyne rather than the theoretical work that preceded him. More recently, Anita Guerrini's *Obesity and Depression in the Enlightenment: The Life and Times of George Cheyne* (Norman, OK: University of Oklahoma Press, 2000) argues that Cheyne's dieting was as much religiously motivated as scientifically.
11. Santorio Santorio, *De medicina statica* (Paris: Natale Pissot, 1725). This was first published in 1611?. This passage is cited in James Mackenzie, *The History of Health and the Art of Preserving It* (Edinburgh: William Gordon, 1758), 265. The fullest recent account of Mackenzie and his

importance can be found in Heikki Mikkeli, *Hygiene in the Early Modern Medical Tradition* (Helsinki: Academia Scientiarum Fennica, 1999).

12. Mackenzie, 275.
13. Walter Charlton (sic), *Natural History of Nutrition, of Life, and Voluntary Motion* (London: Henry Herrington, 1659), 53-55.
14. Mackenzie, 252.
15. Mackenzie, 259.
16. Hermann Boerhaave, *Opera Omnia* (Venice: Laurentium Basilium, 1742), 55. 'Efficiunt, conservant, augent, et restituunt hanc, viscera, vasa, fibrae, robusta; motus corporis exercitatus ad primum initium levissimi sudoris; venus modicè exercita, excitata corporis salubri robore, non mentis instigante consilio; somnus septem, vel octo, horarum bene tecto corpore, nec gravato nimio stragulorum pondere, affectus moderatae laetitiae; juventa, cibi solidi, leves, fermentati, non pingues, interpolatis levissimis aromatibus; aer purus, serenus, siccus, gravis, frigidus.'
17. Louis Lemery, *Traité des aliments* (Paris: Pierre Witte, 1705, 2nd ed.), 33-34. 'Enfin on observe que la plûpart des personnes maigres sont fort sanguines, et que les personnes grasses abondent moins en sang; la raison en peut estre que dans les premieres où la chaleur est beaucoup plus vive, le chyle se tourne tres vite en sang à cause de la fermentation considerable qui'il y subit, et que le rend bientôt incapable de nourrir les parties solides. Dans les dernieres au contraire où la chaleur est beaucoup moindre; le chyle ne fermente que moderément, et conservant davantage et plus longtemps sa consistance chyleuse et propre à nourrir, il se separe plus abondamment du reste de la liqueur avec laquelle il circuloit, pour s'attacher dans toutes les espaces vuides des parties solides où il est porté.'
18. John Arbuthnot, *Essai sur la nature et choix des aliments* (Paris: Guillaume Cavelier 1741, 302-3.
19. Arbuthnot, 13. 'La graisse est nécessaire pour le mouvement péristaltique des intestins, ainsi que pour les autres mouvements de la machine; les gens maigres souffrent souvent par son défaut, de meme que les gras par l'obstruction des vaisseaux.'
20. George Cheyne, *An Essay of Health and Long Life* (London: George Strahan, 1724; facsimile ed. New York: Arno Press, 1979), 203.
21. Nicholas Andry, *Traité des alimens de caresme*. (Paris: Jean-Baptiste Coignard, 1713), vol. II, p. 248-9. 'La santé s'entretient principalement par la transpiration, et la transpiration dépend principalement de la force...des solides qui poussent les fluides; en sorte que si ces solides sont trop lâches, et que le mouvement d'oscillation, par le moien duquel ils doivent chasser les liqueurs, soit par conséquent trop foible, il ne se doit faire qu'une transpiration imparfaite...l'eau pure, et toutes les nourritures trop aqueuses, quand on fait un trop grand usage, relâchent, à la longue, la tissue des parties de nôtre corps, et leur ôtent de leur fermenté...' A discussion of a comparable controversy in mid-18th century Italy can be found in my article 'Insensible Perspiration and Oily Vegetable Humor: An Eighteenth Century Controversy over Vegetarianism, *Gastronomica*, Fall 2002.
22. Cheyne, 25.
23. Cheyne, 28-9.