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Why are we so fat?

by *Elizabeth Kolbert* July 20, 2009

One of the most comprehensive data sets available about Americans—how tall they are, when they last visited a dentist, what sort of cereal they eat for breakfast, whether they have to pee during the night, and, if so, how often—comes from a series of studies conducted by the federal Centers for Disease Control and Prevention. Participants are chosen at random, interviewed at length, and subjected to a battery of tests in special trailers that the C.D.C. hauls around the country. The studies, known as the National Health and Nutrition Examination Surveys, began during the Eisenhower Administration and have been carried out periodically ever since.

In the early nineteen-nineties, a researcher at the C.D.C. named Katherine Flegal was reviewing the results of the survey then under way when she came across figures that seemed incredible. According to the first National Health study, which was done in the early nineteen-sixties, 24.3 per cent of American adults were overweight—roughly defined as having a body-mass index greater than twenty-seven. (The metrics are slightly different for men and women; by the study's definition, a woman who is five feet tall would count as overweight if she was more than a hundred and forty pounds, and a man who is six feet tall if he weighed more than two hundred and four pounds.) By the time of the second survey, conducted in the early nineteen-seventies, the proportion of overweight adults had increased by three-quarters of a per cent, to twenty-five per cent, and, by the third survey, in the late seventies, it had edged up to 25.4 per cent. The results that Flegal found so surprising came from the fourth survey. During the nineteen-eighties, the American gut, instead of expanding very gradually, had ballooned: 33.3 per cent of adults now qualified as overweight. Flegal began asking around at professional meetings. Had other researchers noticed a change in Americans' waistlines? They had not. This left her feeling even more perplexed. She knew that errors could have sneaked into the data in a variety of ways, so she and her colleagues checked and rechecked the figures. There was no problem that they could identify. Finally, in 1994, they published their findings in the *Journal of the American Medical Association*. In just ten years, they showed, Americans had collectively gained more than a billion pounds. "If this was about tuberculosis, it would be called an epidemic," another researcher wrote in an editorial accompanying the report.

During the next decade, Americans kept right on gaining. Men are now on average seventeen pounds heavier than they were in the late seventies, and for women that figure is even higher: nineteen pounds. The proportion of overweight children, age six to eleven, has more than doubled, while the proportion of overweight adolescents, age twelve to nineteen, has more than tripled. (According to the standards of the United States military, forty per cent of young women and twenty-five per cent of young men weigh too much to enlist.) As the average person became heavier, the very heavy became heavier still; more than twelve million Americans now have a body-mass index greater than forty, which, for someone who is five feet nine, entails weighing more than two hundred and seventy pounds. Hospitals have had to buy special wheelchairs and operating tables to accommodate the obese, and revolving doors have had to be widened—the typical door went from about ten feet to about twelve feet across. An Indiana company called Goliath Casket has begun offering triple-wide coffins with reinforced hinges that can hold up to eleven hundred pounds. It has been estimated that Americans' extra bulk costs the airlines a quarter of a billion dollars' worth of jet fuel annually.

Such a broad social development seems to require an explanation on the same scale. Something big must have changed in America to cause so many people to gain so much weight so quickly. But what, exactly, is unclear—a mystery batter-dipped in an enigma.

Though weight-loss books will doubtless always be more popular, what might be called weight-gain books, which attempt to account for our corpulence, are an expanding genre. In "The Evolution of Obesity" (Johns Hopkins; \$40), Michael L. Power and Jay Schulkin take a frankly Darwinian approach. They argue that we are fat for the same reason that we are capable of studying our backsides in the mirror. "In many ways we can blame the

obesity epidemic on our brains,” they write.

Brains are calorically demanding organs. Our distant ancestors had small ones. *Australopithecus afarensis*, for example, who lived some three million years ago, had a cranial capacity of about four hundred cubic centimetres, which is roughly the same as a chimpanzee’s. Modern humans have a cranial capacity of about thirteen hundred cubic centimetres. How, as their brains got bigger, did our forebears keep them running? According to what’s known as the Expensive Tissue Hypothesis, early humans compensated for the energy used in their heads by cutting back on the energy used in their guts; as man’s cranium grew, his digestive tract shrank. This forced him to obtain more energy-dense foods than his fellow-primates were subsisting on, which put a premium on adding further brain power. The result of this self-reinforcing process was a strong taste for foods that are high in calories and easy to digest; just as it is natural for gorillas to love leaves, it is natural for people to love funnel cakes.

Although no one really knows what life was like in the Pleistocene, it seems reasonable to assume that early humans lived, as it were, hand to mouth. In good times, they needed to stockpile food for use in hard times, but the only place they had to store it was on themselves. Body fat is energy-rich and at the same time lightweight: when the water is taken out, a gram of fat contains 9.4 kilocalories, compared with 4.3 kilocalories for a gram of protein, and when the water is left in, as it is on the human belly, a gram of fat still contains 9.1 kilocalories, while a gram of protein has just 1.2. As a consequence, a person with a genetic knack for storing fat would have had a competitive advantage. Power and Schulkin are both researchers at the American College of Obstetricians and Gynecologists, and they argue that this advantage would have been especially strong for women. Human infants are unusually portly; among mammals, only hooded seals have a higher percentage of body fat at birth. (Presumably, babies need the extra reserves to fuel their oversized brains.) Tellingly, humans, unlike most other animals, have no set season of fertility. Instead, ovulation is tied to a woman’s fat stores: those who are very thin simply fail to menstruate.

Of course, for early humans putting on too many pounds would have been a significant disadvantage; it’s hard to chase down a mastodon or track through a forest if you’re tubby. Thus, there would appear to be a Darwinian argument against obesity as well. Power and Schulkin get around this problem by noting that, as a practical matter, opportunities for eating too much were limited. Austerity was the rule for hunter-gatherer societies, and that didn’t change when people started to form farming communities, some ten thousand years ago. In fact, human remains from many parts of the world show that early agriculturalists were less well fed than their Paleolithic forebears; their skeletons are several inches shorter and often show signs of nutrition-related diseases, like anemia. Genes that controlled weight gain wouldn’t have been selected for because they simply weren’t needed.

In America today, by contrast, obtaining calories is very nearly effortless; as Power and Schulkin observe, with a few dollars it’s possible to go to the grocery store and purchase enough sugar or vegetable oil to fulfill the average person’s energy requirements for a week. The result is what’s known as the “mismatch paradigm.” The human body is “mismatched” to the human situation. “We evolved on the savannahs of Africa,” Power and Schulkin write. “We now live in Candyland.”

The evolutionary account of obesity is a powerful one—indeed, almost too powerful. If, as Power and Schulkin contend, humans are genetically programmed to put on weight whenever they encounter plenty, it would seem that by this point virtually everyone in America should be fat. Meanwhile, several million years of hominid evolution can’t explain why it is just in the past few decades that waistlines have expanded.

Eric Finkelstein is a health economist at a research institute in North Carolina. In “The Fattening of America” (Wiley; \$26.95), written with Laurie Zuckerman, he argues that Americans started to put on pounds in the eighties because it made financial sense for them to do so. Relative to other goods and services, food has got cheaper in the past few decades, and fattening foods, in particular, have become a bargain. Between 1983 and 2005, the real cost of fats and oils declined by sixteen per cent. During the same period, the real cost of soft drinks dropped by more than twenty per cent.

“For most people, an ice cold Coca-Cola used to be a treat reserved for special occasions,” Finkelstein observes. Today, soft drinks account for about seven per cent of all the calories ingested in the United States,

making them “the number one food consumed in the American diet.” If, instead of sweetened beverages, the average American drank water, Finkelstein calculates, he or she would weigh fifteen pounds less.

The correlation between cost and consumption is pretty compelling; as Finkelstein notes, there’s no more basic tenet of economics than that price matters. But, like evolution, economics alone doesn’t seem adequate to the obesity problem. If it’s cheap to consume too many calories’ worth of ice cream or Coca-Cola, it’s even cheaper to consume fewer.

In “The End of Overeating” (Rodale; \$25.95), David A. Kessler, a former commissioner of the Food and Drug Administration, takes a somewhat darker view of the situation. It’s not that sweet and oily foods have become less expensive; it’s that they’ve been reengineered while we weren’t looking. Kessler spends a lot of time meeting with (often anonymous) consultants who describe how they are trying to fashion products that offer what’s become known in the food industry as “eatertainment.” Fat, sugar, and salt turn out to be the crucial elements in this quest: different “eatertaining” items mix these ingredients in different but invariably highly caloric combinations. A food scientist for Frito-Lay relates how the company is seeking to create “a lot of fun in your mouth” with products like Nacho Cheese Doritos, which meld “three different cheese notes” with lots of salt and oil. Another product-development expert talks about how she is trying to “unlock the code of craveability,” and a third about the effort to “cram as much hedonics as you can in one dish.”

Kessler invents his own term—“conditioned hypereating”—to describe how people respond to these laboratory-designed concoctions. Foods like Cinnabons and Starbucks’ Strawberries & Crème Frappuccinos are, he maintains, like drugs: “Conditioned hypereating works the same way as other ‘stimulus response’ disorders in which reward is involved, such as compulsive gambling and substance abuse.” For Kessler, the analogy is not merely rhetorical: research on rats, he maintains, proves that the animals’ brains react to sweet, fatty foods the same way that addicts’ respond to cocaine. A reformed overeater himself—“I have owned suits in every size,” he writes—Kessler advises his readers to eschew dieting in favor of a program that he calls Food Rehab. The principles of Food Rehab owe a lot to those of drug rehab, except that it is not, as Kessler acknowledges, advisable to swear off eating altogether. “The substitute for rewarding food is often other rewarding food,” he writes, though what could compensate for the loss of Nacho Cheese Doritos he never really explains.

In the early nineteen-sixties, a man named David Wallerstein was running a chain of movie theatres in the Midwest and wondering how to boost popcorn sales. Wallerstein had already tried matinée pricing and two-for-one specials, but to no avail. According to Greg Critser, the author of “Fat Land” (2003), one night the answer came to him: jumbo-sized boxes. Once Wallerstein introduced the bigger boxes, popcorn sales at his theatres soared, and so did those of another high-margin item, soda.

A decade later, Wallerstein had retired from the movie business and was serving on McDonald’s board of directors when the chain confronted a similar problem. Customers were purchasing a burger and perhaps a soft drink or a bag of fries, and then leaving. How could they be persuaded to buy more? Wallerstein’s suggestion—a bigger bag of fries—was greeted skeptically by the company’s founder, Ray Kroc. Kroc pointed out that if people wanted more fries they could always order a second bag.

“But Ray,” Wallerstein is reputed to have said, “they don’t want to eat two bags—they don’t want to look like a glutton.” Eventually, Kroc let himself be convinced; the rest, as they say, is supersizing.

The elasticity of the human appetite is the subject of Brian Wansink’s “Mindless Eating” (2006). Wansink is the director of Cornell University’s Food and Brand Lab, and he has performed all sorts of experiments to test how much people will eat under varying circumstances. These have convinced him that people are—to put it politely—rather dim. They have no idea how much they want to eat or, once they have eaten, how much they’ve consumed. Instead, they rely on external cues, like portion size, to tell them when to stop. The result is that as French-fry bags get bigger, so, too, do French-fry eaters.

Consider the movie-matinée experiment. Some years ago, Wansink and his graduate students handed out buckets of popcorn to Saturday-afternoon filmgoers in Chicago. The popcorn had been prepared almost a week earlier, and then allowed to become hopelessly, squeakily stale. Some patrons got medium-sized buckets of stale popcorn and some got large ones. (A few, forgetting that the snack had been free, demanded their money

back.) After the film, Wansink weighed the remaining kernels. He found that people who'd been given bigger buckets had eaten, on average, fifty-three per cent more.

In another experiment, Wansink invited participants to cook dinner for themselves with ingredients that he provided. One group got big boxes of pasta and big bottles of sauce, a second smaller boxes and smaller bottles. The first group prepared twenty-three per cent more, and downed it all. In yet another experiment, Wansink rigged up bowls that could be refilled, via a hidden tube. When he served soup out of the trick bowls, people, he writes, "ate and ate and ate." On average, they consumed seventy-three per cent more than those who were served from regular bowls. "Give them a lot and they eat a lot," he writes.

Before McDonald's discovered the power of re-portioning, it offered just a small bag of French fries, which contained two hundred calories. Today, a small order of fries has two hundred and thirty calories, and a large order five hundred. (Add fifteen calories for each package of ketchup.) Similarly, a McDonald's soda used to be eight ounces. Today, a small soda is sixteen ounces (a hundred and fifty calories), and a large soda is thirty-two ounces (three hundred calories). Perhaps owing to the influence of fast-food culture, up-sizing has by now spread to all sorts of other venues. In a 2002 study, Marion Nestle, a nutrition professor at New York University, and Lisa Young, an adjunct there, examined the offerings, past and present, at American supermarkets. They found that during the nineteen-eighties the amount of food that was counted as a single serving increased rapidly. A similar jump showed up in cookbooks; when the researchers compared dessert recipes in old and new editions of volumes like "The Joy of Cooking," they discovered that, even in cases where the recipes themselves had remained unchanged, the predicted number of servings had shrunk. According to the federally supported National Heart, Lung, and Blood Institute, the bagels that Americans eat have in the past twenty years swelled from a hundred and forty to three hundred and fifty calories each. If, as Wansink argues, people are relying on external cues to determine their consumption, then the new, bigger bagel is sneaking in an additional two hundred and ten calories. For someone who is in the habit of eating a bagel a day, these extra calories translate into a weight gain of more than a pound a month.

So what's wrong with putting on an extra pound, or ten pounds, or, for that matter, a hundred and ten? According to the contributors to "The Fat Studies Reader" (forthcoming from New York University; \$27), nothing. The movement known variously as "size acceptance," "fat acceptance," "fat liberation," and "fat power" has been around for more than four decades; in 1967, at a "fat-in" staged in Central Park, participants vilified Twiggy, burned diet books, and handed out candy. More recently, fat studies has emerged as a field of scholarly inquiry; four years ago, the Popular Culture Association/American Cultural Association added a fat-studies component to its national conferences, and in 2006 Smith College hosted a three-day seminar titled "Fat and the Academy."

Among the founding principles of the discipline is that weight is not a dietary issue but a political one. "Fat studies is a radical field, in the sense that it goes to the root of weight-related belief systems," Marilyn Wann, who describes herself as five feet four and two hundred and eighty-five pounds, writes in her foreword to the "Reader." Kathleen LeBesco, a communications professor at Marymount Manhattan College and another contributor, has put it this way:

Fat people are widely represented in popular culture and in interpersonal interactions as revolting—they are agents of abhorrence and disgust. But if we think about "revolting" in a different way . . . in terms of overthrowing authority, rebelling, protesting, and rejecting, then corpulence carries a whole new weight as a subversive cultural practice.

According to the authors of "The Fat Studies Reader," the real problem isn't the sudden surge in obesity in this country but the surge in stories about obesity. Weight, by their account, is, like race or sex or bone structure, a biological trait over which individuals have no—or, in the case of fat, very limited—control. A "societal fat phobia," Natalie Boero, a sociology professor at San Jose State University, writes, "in part explains why the 'obesity epidemic' is only now beginning to be critically deconstructed."

Undeniably, the fat—the authors of "The Reader" are adamant advocates for the "f" word—are subject to prejudice and even cruelty. A 2008 report by the Rudd Center for Food Policy and Obesity, at Yale, noted that teachers consistently hold lower expectations of overweight children, and that three out of five of the heaviest

kids have been teased at school. The same people who are repelled by racist or misogynistic humor seem to feel that it is perfectly acceptable to make fat jokes.

But, just because size bias exists it doesn't follow that putting on weight is a subversive act. In contrast to the field's claims about itself, fat studies ends up taking some remarkably conservative positions. It effectively allies itself with McDonald's and the rest of the processed-food industry, while opposing the sorts of groups that advocate better school-lunch programs and more public parks. To claim that some people are just meant to be fat is not quite the same as arguing that some people are just meant to be poor, but it comes uncomfortably close.

As its title suggests, "Globesity" (Earthscan; \$34.95) takes an international approach to the problem of weight gain. The book's authors—Francis Delpeuch, Bernard Maire, Emmanuel Monnier, and Michelle Holdsworth—observe that, while Americans were the first to fatten up, they no longer lead the pack. "Like it or not, we have no choice but to face up to the numbers: current data reveal that in Cyprus, the Czech Republic, Finland, Germany, Greece, Malta, and Slovakia, the proportion of overweight adults is actually higher than in the U.S.," they write. In Asia, Africa, and South America, too, obesity is on the rise. Although nearly a billion of the world's most impoverished citizens still suffer from too few calories, Delpeuch and his colleagues note that it's those living just above the poverty level who appear to be gaining weight most rapidly. It may seem to go without saying that being fat is better than starving, but even this truism, the authors argue, is no longer entirely true: in the new world order, it is possible to be overweight and malnourished at the same time. "People on modest incomes suddenly find a cheap, calorie-packed diet within their grasp and make the most of it as soon as they can," they write. "Unfortunately this means sacrificing many elements that are nutritionally more valuable."

The authors of "Globesity" are, for the most part, nutrition researchers, and, in contrast to the contributors to "The Fat Studies Reader," they see obesity as a disaster, both for the individuals who suffer from it and for the health-care systems they are likely to enter. Type 2 diabetes, coronary disease, hypertension, various kinds of cancers—including colorectal and endometrial—gallstones, and osteoarthritis are just some of the conditions that have been linked to excess weight. (Last month, the Times reported that gout, once considered a disease of royalty, is, as the population gets fatter, making a comeback among the middle class.) It has been estimated that the extra pounds carried by Americans add ninety billion dollars a year to the country's medical spending. No credible estimates exist for global costs, but, Delpeuch and his co-authors write, "Obesity is inescapably confirming itself as one of the biggest drains" on national health-care budgets.

Whether anything will be done—or even can be done—to stem the global tide of obesity is, at this point, an open question. The World Health Organization has come up with more than three dozen actions that governments could take to encourage better eating and fitness; these include imposing a "fat tax" on caloric snacks, improving health education, regulating food and beverage advertising, limiting the foods available in public facilities, and insuring access to sidewalks and bike paths.

But, as anyone who has ever gone on a diet knows, weight that was easy to gain is hard to lose. If anything, this is even more true on a societal level. Those politicians who could take the recommended actions tend, the authors of "Globesity" point out, to be in thrall to the very interest groups that are profiting from the status quo. (It's probably no coincidence that, in a period when the rest of the world has come to look more like Americans, U.S. corporations have been making significant investments—some fifty-five billion dollars a year—in food-processing and distribution facilities abroad.) "To conquer obesity will thus require a complete new awareness, the re-education of the great mass of consumers, and this seems a distant prospect," they write.

In the end, it's hard to argue with such fatalism. The problem goes even beyond the corporate interests that have brought us "eatertaining" foods, Value Meals, and oceans of high-fructose corn syrup. Collecting the maximum number of calories with the least amount of effort is, after all, the dream of every creature, including those too primitive to dream. With the BK™ Quad Stacker—four beef patties, four pieces of bacon, and four slices of cheese for \$4.99—man edges close to realizing this ambition. And that's without the fries. ♦