

Cooked, A Natural History of Transformation

by Michael Pollan

Reviewed by Gregory R. Ziegler, Penn State Professor of Food Science
May 2013

PENNSSTATE



This most recent book by journalist Michael Pollan follows what is now the Pollan formula – three or four sections with one-word subtitles – in the present case: fire, water, air and earth¹. In *Cooked, A Natural History of Transformation*, Pollan sets out “to pinpoint the precise historical moment that cooking took its fatefully wrong turn: when civilization began processing food in such a way as to make it

less nutritious rather than more.” Spoiler alert! “[T]he sharpest and clearest line would be the advent of pure white flour...”

One thing I appreciated most about Pollan's writing was what always appeared as a thoughtful and sincere attempt to get to the “truth,” an ability to suspend prejudice to reach an understanding of the underlying complexity of the issues at hand. Unfortunately, “Michael Pollan” is now a cultural phenomenon with a following and a brand². He stands for something and, hence, is no longer free to reach any conclusion that reason might suggest. *Cooked* is, therefore, more polemic without the humility of his previous works, and I struggled to maintain my objectivity, since evil³ is embodied in the “food scientist” (of which I am one). But due to Pollan's celebrity *Cooked* will no doubt be a best seller.

There is nothing new here, the arguments contained in *Cooked* are not novel⁴. Pollan is a Romantic, and *Cooked* an anti-modern⁵, anti-science diatribe, except when it isn't. He does employ modern techniques and invokes scientific information when it is convenient to his cooking or his argument. While others deny the consequences of modernity, e.g. climate change, Pollan denies its benefits, e.g. greater life expectancy. Even his central dogma, that the line was crossed with roller milling of wheat is old hat⁶. In *Cooked* I find Pollan to be incredibly naïve.

However, naivety can sometimes be a strength. My favorite definition of *science* comes from Richard Feynman – “science is the belief in the ignorance of experts.” *Cooked* has challenged me to take a fresh look at the assumptions underlying my work and sent me numerous times to the scientific literature, deepening my understanding of what it means to cook.

Fire

“...[T]he world of the pit master seems premodern, almost epic in its directness and lack of shading or irony.” I wish I could say the same for *Cooked*. Pollan writes nostalgically of tobacco culture, “[t]he

¹ *Botany of Desire*: Sweetness, Beauty, Intoxication, Control; *Omnivore's Dilemma*: Corn, Grass, Forest

² I once invited him to speak at Penn State University. His quoted fee in 2006 was \$15,000.00.

³ Pollan explicitly uses the term “evils of agribusiness.”

⁴ <http://www.theatlantic.com/sexes/archive/2013/05/the-women-who-scooped-michael-pollan-by-200-years/275588/>

⁵ “proud efforts to stand their ground against the tide of modernity” (p. 48), “uncontaminated by modern innovations” (p. 34)

⁶ *Six Thousand Years of Bread, Its Holy and Unholy History* by H.E. Jacob, pp. 242-243, 261-263

agriculture that used to *nourish* the town's economy has suffered both the decline of tobacco (only the occasional *emerald acre* of it survives amid the *paler fields* of corn)...⁷ [emphases mine]. Pretty ironic for someone concerned about the "crisis in our health" created by "the industrialization of our eating." A portion of the increase in the weight of Americans over the last generation is attributable to smoking cessation. However, the possible negative health effects of the extra weight are likely far outweighed (no pun intended) by the benefits of quitting smoking.

I love a campfire and the scent of wood smoke in the cold, crisp air of winter always brings a smile to my face, but smoke from cooking fires poses a serious health hazard for the approximately 3.5 billion people forced to use wood, charcoal, dung or other solid fuels⁸ to cook their meals. Indoor smoke kills a million and a half people annually according to the World Health Organization. The burning of Europe's forests in pre-modern times has been described as man's first energy crisis, and the heavy reliance on wood as fuel continues to cause severe deforestation in some regions of the world.

I need to thank Michael Pollan for reminding me of what an exceptional upbringing I had – pig roasts were common, we even roasted a pig at my older brother's wedding. My father was a "meat scientist." The home I grew up in is filled with porcine artifacts, including pictures of those older breeds of pigs that make for great barbeque. What Pollan doesn't discuss is why "modern" hogs "had been reengineered ...to be much leaner..." The use of lard, for cornbread or otherwise, fell victim to "The Lipid Hypothesis" that "idea that dietary fat is responsible for chronic disease," and while Pollan contends that food scientists readily jumped on the "nutritionism" bandwagon, in order to sell an unwitting public on margarine⁹, this was certainly not true of the animal industries. Defenders of lard (butter, eggs, etc.), food scientists among them, were labeled shills of the food industry. Lean hogs arose from a consumer desire for leaner meat¹⁰.

At about the same time, the war on salt began. Pollan contends that "[c]orporations cook very differently from how people do..." "They tend to use much more sugar, fat and salt than people cooking for people." Ironically, copious amounts of salt find their way into Pollan's barbeque. "A few generous handfuls of kosher salt – not to flavor it...but to dry out the skin and encourage it to blister..." "which lends some nice salty crunch." (This would be the same salty crunch that Michael Moss accuses the food industry of addicting us to.¹¹) "I added whatever ingredients he called for...handfuls of sugar, salt, and pepper..." "I sprinkled several handfuls of salt on the fatty side..." "[T]he mixture that really made the dish extraordinary: a tidy, brittle, irreducible packet of salt, fat and wood smoke" (Now there's health food for you.) "They all knew about crackling and didn't want to wait for us to serve it." "[W]e were in a position to give them what they craved..." Nearly word-for-word what the food industry says about its products.

Water

The issue of salt, or more precisely sodium, in our diet is a confusing one. Just recently the Institute of Medicine released a report¹² concluding that there was little evidence to support a reduction in sodium intake below 2300 mg per day and that for some people sodium reduction may actually increase their risk of coronary heart disease. Yet the addition of salt is one of the evils done to us by the food industry.

⁷ See also pages 47 and 83-84 (such is his disdain for our native American grass)

⁸ "Hearth Surgery," Burkhard Bilger, *The New Yorker*, Dec. 21 & 28, 2009.

⁹ *In Defense of Food*

¹⁰ To be clear, I am no fan of CAFOs.

¹¹ *Salt, Sugar, Fat*

¹² *Sodium Intake in Populations*, National Academy of Sciences (2013)

“When we let corporations cook for us, they’re bound to skimp on quality ingredients and go heavy on the sugar, fat and salt.”

If we are to believe the scientists, 77% of the 3400 mg of sodium that the average American consumes each day comes from “processed foods”,¹³ a fact that Pollan uses to ease his conscience when advised to “[u]se at least three times as much salt as you think you should,’ ... (A second authority [he] consulted employed the same formulation, but upped the factor to five.)” Pollan is now “a proud, indulgent liberal with the salt.”

If we are to understand the error in his logic, we need to understand a little more about how the research was conducted. Investigators at the Monell Chemical Senses Center collected 7-day dietary records from 62 adult users of discretionary salt that allowed them to assess the source of salt in their diet¹⁴. The participants were permitted to eat their regular diet that apparently included “processed foods.” The results: 77% of sodium was added during processing, 12% was inherent in the foods and 11% was added at the table or during cooking. That is, *participants added 11% sodium above what the food contained* (regardless of source). Maybe in addition to letting corporations cook for us, we have let them salt our food too.

“Cooking in a pot is all about economy. Every last drop of the fat and juices from the meat, which over a fire would be lost, are conserved, *along with all the nutrients from the plants*” [emphasis mine]. Cooking does generally improve nutrient bioavailability¹⁵, but it usually results in a lower total nutrient content regardless of whether the food is cooked at home or by a corporation¹⁶. However, the long, slow cooking at low temperature suggested by Pollan generally results in greater nutrient destruction (if “nutrients” are defined simply as vitamins). Food scientists work to optimize thermal processing to achieve adequate safety while retaining the greatest nutrient content¹⁷. This is why commercially canned food can often have a higher nutrient content than home canned vegetables¹⁸.

Pollan apparently doesn’t see any irony in his use of *dashi*, a solution of monosodium glutamate (MSG) prepared by soaking *kombu*, – “one of the richest sources of glutamate in nature...it wears a cloak of white salt that is basically monosodium glutamate” – and the food scientists’ use of hydrolyzed vegetable protein, “an ingredient-label euphemism for monosodium glutamate (MSG) – basically a cheap way to boost the perception of umami.” A “natural” source of hydrolyzed vegetable protein would be your basic soy sauce. What seems important to Pollan is that the *dashi* was “designed...unwittingly”, for if any rational thought had gone into its invention it might have been modern.

Air

For several years I taught a first-year seminar course titled “Bread.” Quoting from my 2003 course syllabus, “[b]read is a product, symbol and a producer of *transformations*, and this will be a sub-theme of the course.” [Emphasis in the original.] So you can understand that I took particular interest in this section of *Cooked*.

¹³ At least in 1991. Food processors have been reducing salt in their formulas for years.

¹⁴ Mattes, RD & Donnelly D. 1991. *J.Am.Coll.Nutr.*, 10, 383-393

¹⁵ See reference to the “cooking hypothesis” by Richard Wrangham (and read *Catching Fire*).

¹⁶ Due to degradation by heat.

¹⁷ Done using high-temperature, short-time cooks.

¹⁸ Especially those in Mason jars where light rapidly destroys vitamins. And probably a smaller carbon footprint.

The co-evolution of man and grasses is a recurrent theme in Pollan's writing. Unfortunately, his thinking on this hasn't progressed since *Botany of Desire*. "In time," Pollan writes, "the plants evolved to gratify our desires, developing ever-bigger seeds and refraining from 'shattering'..."¹⁹ I doubt the plants had any such thing in mind. These traits were likely selected for by our late Paleolithic ancestors (though important to Pollan is that they did this unconsciously, which I also doubt). One other attribute they selected for was light colored seeds.

Most every grain or seed that has been domesticated by man comprises both light and dark varieties. In most instances the dark varieties are most closely related to their wild ancestors. So man's selection of these light varieties, which may predate the invention of any milling technology, and a preference for eating them represents our first attempt to make lighter-colored "bread."

Pollan writes that, "[b]rown bread, being less processed than white, was clearly what nature intended us to eat."²⁰ If this is so, why has man gone to such great lengths over such an extended period of time to lighten his flour through crop selection and milling technology? The "logic of industrial capitalism" may have favored white bread over brown, but why then would pre-modern peoples prefer it? It could be a simple matter of gastric distress – the word pumpernickel may derive from "devil's fart...so named for being hard to digest"²¹ – then again there may be more to it.

Since for Pollan anecdote is evidence, permit me to spin a tale of my own. I had two pet cockatiels, Buddy and Louie. Given millet, their favorite, they deftly manipulated it with the tip of their beak to carefully remove the pericarp, which they discarded. With wheat they assiduously scraped the endosperm from the bran, leaving the later to drop to the floor of the cage. And if I bought them inexpensive food that contained sorghum (milo), they acted like kids with Brussels sprouts²². The pigmented inner integument of "bird resistant" sorghum contains condensed tannins, bitter-tasting, *antinutritional* compounds and, like most seeds, phytates that severely limit mineral bioavailability. So the birds were carefully consuming the most nutritious parts, avoiding the antinutrients.

What you say? Isn't the endosperm "just garbage?" "We are not selling nutrition. Just endosperm." The "White Flour Industrial Complex...scrupulously sheer off the most nutritious parts of the seed – the coat of bran and the embryo, or germ, that it protects"²³ – and sell that off, retaining *the least nourishing part* to feed us" [emphasis mine]. Only someone able to obtain enough calories and protein from other sources would agree that the endosperm is the least nourishing part. The endosperm is the portion of the grain where the plant stores its macronutrients for growth – starch and protein in the case of wheat. I wonder how long a person could stay healthy on a diet consisting solely of wheat bran?²⁴

The "Egyptians were now masters of a ... technology for transforming nature into nourishment. So was born bread baking, the world's first food-processing industry." But we Crossed the Rubicon with "the advent of pure white flour (and the bread made from it) in the second half of the nineteenth century." The problem with this conclusion is that it's just not true. "The essence of milling had consisted, since

¹⁹ See the philosophy of Henri Bergson and *élan vital*.

²⁰ A "loaf of bread declares itself as an artifact, an original, *man-made*, freestanding object..." [emphasis mine]. I don't think "nature" ever intended us to eat bread.

²¹ <http://en.wikipedia.org/wiki/Pumpernickel#Etymology>

²² Since the wild birds leave milo in my feeders uneaten, I have to conclude that Buddy and Louie were not emulating their keeper.

²³ As do Buddy and Louie, I guess they are in on the conspiracy.

²⁴ Assuming they could stay on such a diet very long. This is an example of the influence of "nutritionism," where vitamins became "the most nutritious part."

ancient times, in separating the flour from the bran.²⁵ And progressive milling using a series of stone mills and bolts to sieve the flour from the bran was described as early as 1760. But stone mills, even when well operated, contaminated the flour with, well, stone that eroded teeth, a problem avoided with the introduction of steel roller mills.

Every technology, even the most “old timey,”²⁶ generally brings with it unanticipated consequences – stone or fiber, your choice. But are these our only choices? Joe Vanderliet, proprietor of Certified Foods, miller for Community Grains, and Pollan food hero (despite being “extremely secretive about his milling methods”) employs a combination of stone mills, roller mills and hammer mills “to produce a more finely granulated whole-grain flour than a stone mill alone could produce...[t]he extra steps may also increase the shelf life of the flour.” Sounds a lot like the ConAgra Ultrafine process “that attains a degree of fineness never before achieved in a whole grain flour,” but which Pollan criticizes because its glycemic index²⁷ is essentially the same as Classic Wonderbread²⁸. Has anyone ever tested the glycemic index of bread made with Vanderliet’s flour (or for that matter Pollan’s “improved” whole grain bread)?

“You cannot fractionate the seed without ruining the flour. As soon as you separate the bran from the germ, that’s it, it’s all over: The germ will turn rancid. Its nutrition will be lost. What you have to understand – write this down! – is that nature made a perfect package when it made the seed...” says Vanderliet. If nature does in fact have agency, then its “intent” certainly wasn’t to make the perfect food for humans; a perfect food for wheat maybe. Agency or not, nature was ingenious enough to place vital nutrients (e.g. some vitamins) in close proximity with antinutrients (e.g. condensed tannins and phytates), saying to any animal tempted to eat them, you can’t get one without the other.

“Most commercial whole-wheat flour is actually white flour to which the bran and the germ have been added back in²⁹.” In his quest to “bake a better loaf of whole grain bread” (i.e. one more aesthetically like white bread), Pollan “sifted the chunkiest bran out of the flour” and added it back to the exterior of his loaf. Does he think this is “cheating?” No, since “[e]very last bit of whole grain was somewhere in this triumphant voluminous loaf.” Ironic?³⁰ You decide.

Earth

Though *Earth* is perhaps the most original section of the book and the one most reliant on modern scientific information, Pollan’s discussion of fermentation, the hygiene hypothesis and the human microbiome lacks any real depth of understanding. If you have only limited time to read, I recommend going directly to *The Art of Fermentation* by Sandor Katz.³¹

Pollan relates the story of Sister Noëlla and her raw milk cheese. It seems that the “cheese nun” made two batches of cheese, one in her wooden barrel that harbored her cheese culture and one in a stainless steel vat, each inoculated with *E. coli*. Pollan says, “[t]hat what happened next was, at least to a Pasteurian, utterly baffling: The cheese that had been started in the sterile vat had high levels of *E. Coli*,

²⁵ *Six Thousand Years of Bread, Its Holy and Unholy History* by H.E. Jacob, pp. 242

²⁶ A phrase Pollan repeated too many times in *Cooked*.

²⁷ Rate of blood glucose rise after eating.

²⁸ The criticism of Wonderbread is by now cliché. For a more interesting critique of industrial bread, see “Death in the Kitchen” from *Does in Matter* by Alan Watts.

²⁹ If we are to believe the unsigned email from General Mills.

³⁰ To add to the irony, he sometimes uses the bran, i.e. “the most nourishing part” to thwart slugs and snails in his garden.

³¹ You can get your Pollan fix from the *Forward*

and the cheese made in the wooden barrel had *next to none*.” [Emphasis added.] I don't know who these confused Pasteurians are, but any respectable food scientist would not have been baffled at all. Of course milk inoculated with a sufficient “starter culture,” as happened in the wooden barrel but not in the stainless steel³², would inhibit the *E. coli*. However, what is more troubling here is that “next to none” can still be lethal (e.g. <10 for *E. coli* O157:H7³³).

Historically most fermentations were, and many worldwide still are, started by “backslopping.” That is, taking a small portion of a previous batch to inoculate the next batch. Such was the case for the fermented sausage known as Lebanon bologna (ironically the only truly American-style fermented sausage, named after Lebanon county Pennsylvania). The problem with backslopping is that it doesn't always work, and batches go bad too often. I've heard it said, tongue in cheek, that the soil in Lebanon County is so rich because of all the bad bologna buried there. But then who cares since we've got plenty, “[a]nd they were willing, with a shrug and a rueful smile, to throw out a bad batch every now and then.”

To avoid this waste, food scientists use starter cultures (as does Pollan) “that are selected and trained by the baker.” But in the hands of the “White Flour Industrial Complex” the yeast *Sacchromyces cerevisiae*, which Pollan refers to as “the remarkable fungus” and “Man's best friend” when he uses it to make beer, is a “monoculture.” “Though commercial yeast is alive, its behavior is linear, mechanical, and predictable, a simple matter of inputs and outputs – which is no doubt why *S. cerevisiae* can be counted on to perform the same way everywhere and give the same results, making it supremely well suited to industrial production.”

Pollan has extended and elaborated on his co-evolution theme by including the “dance of mutual exploitation that these two cultures [human and sourdough] have performed for six thousand years...and required no conscious awareness on our part...” “But surely the greatest evolutionary trick of all came when *S. cerevisiae* first figured out – unconsciously of course – that the very same molecule it had originally devised³⁴ to poison its enemies was also capable of making it a coevolutionary partner as powerful, ingenious, and well traveled as *Homo sapiens*.” “Humans owe a large debt to *S. cerevisiae*...[a] single, shimmering single-celled blue-brown yeast...”

“The process of ‘artificial selection’ that shaped these yeasts is much like the one that transformed the wild wolf into a variety of different dogs, except that in the case of *S. cerevisiae*, the selection came earlier and was entirely unconscious,” writes Pollan. Was pre-Enlightenment woman really such an idiot? It is important to Pollan's argument that this co-evolution proceeded without a rational basis. So much so that it appears again and again. This attitude itself is a modern perspective. I don't think the human desire for understanding and control started with the Age of Reason.

Pollan claims that the “hygiene hypothesis” is now widely accepted³⁵, which may be so, but it is still far from understood. He reduces a rather complex idea to “children need to be exposed to more bacteria, not fewer.”³⁶ Does the hygiene hypothesis mean we should give up on sanitation? I have traveled enough of the world to become familiar with the consequences of poor sanitation (and thankful

³²Professor Pollan is definitely post-modern (or is it pre-modern) when it comes to the “scientific method.” This experiment reminds me of that by Kerin O'Dea with Australian aborigines described in *In Defense of Food*.

³³*E. coli* O157:H7 evolved about 7,000 years ago and not as a result of recent agricultural practices as previously suggested by Pollan.

³⁴ usually implies some intent

³⁵ But doesn't tell us by whom, scientists perhaps? So was “The Lipid Hypothesis”.

³⁶ For a better read on this topic I recommend *Good Germs, Bad Germs* by J.S. Sachs.

for the benefits of good hygiene). He describes, without irony, that “[m]ead and beer and wine were safer to drink than water, since the alcohol in these drinks (and the fact that *they were boiled*) killed off any pathogens in the water.” What I’ve italicized in the preceding sentence could be used as a reasonable definition of *pasteurization*. Many fermented foods are cooked by heat prior to being eaten, nullifying any benefits of a living culture.³⁷

Pollan asserts that the “complexity of the gut microbiota...has been, until very recently, invisible to the reductive lens of Western science, which has always been better at understanding individuals (pathogens, variables, elements, whatever) than communities.” Western scientists have been studying the gut microbiota for over a century. Élie Metchnikoff (1845-1916), winner of the 1908 Nobel Prize in Medicine and author of *The Prolongation of Life: Optimistic Studies*, investigated the potential life-lengthening properties of lactic acid bacteria (like those responsible for most food fermentations), inspiring Japanese scientist Minoru Shirota³⁸ to research the causal relationship between bacteria and good intestinal health. This eventually led to the identification of *Lactobacillus casei* (shirota) and the invention of Yakult, first marketed in 1935.³⁹

On Science

Pollan’s attack on “modern,” “Western” or “reductionist” science begins in the introduction. “Science may have replaced the big four [elements: fire, water, air, earth] with a periodic table of 118 elements, and then reduced each of those to ever-tinier particles, but our senses and our dreams have yet to get the news.” Modernism, and particularly science, often becomes the object of derision when times are chaotic, as they are now, and people are seeking a “more innocent time.”⁴⁰ I entirely understand and sympathize with the desire to reduce the complexity of life. I know plenty of scientists that are perfectly capable of dealing with complexity in their specific field of research, but seek simple explanations in others. However, I don’t believe a *reductionist lifestyle* is the solution to the human need for order.⁴¹ (More on order later.)

On Food Science

For Pollan, “food scientists” are nameless, faceless people (?), locked away in corporations, intent on “simulating real food.” Though “food science” and “food scientist” appear numerous times throughout *Cooked*, neither term earns an entry in the Index.

Pollan's heuristic comprises “food science is bad.” Hence if Pollan quotes a “food scientist” to support his views they are no longer referred to as such, e.g. Bruce German Professor of Food Science and Technology at U.C. Davis⁴² is a “food chemist” and Keith Steinkraus, an American food scientist⁴³, becomes “microbiologist and fermentation expert...” He goes on to say, “[t]o read him [Steinkraus] is also to worry about the survival of this biocultural diversity [the microbiota], since the industrialization of the world's food strongly favors both homogenization and sterilization.” I can only assume that Pollan has not read Keith Steinkraus's book *Industrialization of Indigenous Fermented Foods, Revised and Expanded*.

³⁷ Fermented foods may still provide health benefits.

³⁸ Though “Eastern” he used Western scientific methods.

³⁹ http://en.wikipedia.org/wiki/Minoru_Shirota

⁴⁰ In Pollan’s case a “biologically more innocent time.”

⁴¹ Pollan states, “science can’t reduce this complexity to a simple answer,” but apparently he can.

⁴² a Cornell graduate school classmate of mine

⁴³ http://en.wikipedia.org/wiki/Keith_H._Steinkraus, accessed 5/12/13

Pollan asks, “[f]or what has modern food science given us that can compare [to fermentation]?” Anthropologists have recently concluded that European settlers of the Jamestown Colony cannibalized “Jane,” a 14-year-old English girl, in an attempt to survive what is known as “the starving time.” “The extensive chop marks on the bones and their location among other food waste led anthropologists to conclude that Jane’s facial muscles, tongue, and brain were eaten by the starving colonists...”⁴⁴ Why should this be so? The colonists had roasting (fire), braising (water), baking (air), and fermentation (earth). What they didn’t have was canning, freezing, packaging, etc., that is, what they didn’t have was the modern food system.

On at least one point Michael Pollan and I agree, “[i]f we are going to eat animals, it behooves us to waste as few and as little of them as we possibly can...” (I would also include not wasting plant life.) Pollan would likely class “krab,” the imitation crabmeat that shows up on salad bars, among the “foodlike substances” that food scientists concoct. Fake crabmeat is usually made from less desirable species of whitefish, and its industrial production beginning in about 1969 has significantly reduced waste of what in the fisheries business is known as by-catch. For environmentally-conscious consumers, “krab” may be the more sustainable, greener choice.⁴⁵

A further example of food technology’s contribution to waste reduction and environmental stewardship is the use of cheese whey. Prior to about 1970, most cheesemakers simply dumped their whey into streams and rivers. With the introduction of the Clean Water Act of 1972, cheesemakers began recovering the solids from the whey (mostly lactose and whey protein). These solids were originally incorporated into animal feeds, but as technology for separation and purification of the milk sugar and proteins improved, they became food ingredients. So you now find edible whey and high-quality whey proteins in numerous products (much to the chagrin of some). We are once again like Little Miss Muffet, eating our curds *and* whey.

Pollan quotes Sandor Katz to say, “[t]he historical bubble of refrigeration may not last...” I am worried that the historical bubble of plenty we are now experiencing will not last. Famine, even in developed countries, is a not-so-distant reality. Unfortunately, in the U.S. our taste for things like “organ meats” has been steadily declining and our waste of quality food increasing. In his excellent book *Waste, Uncovering the Global Food Scandal* Tristram Stuart suggests we “[f]und research and development in food technology to extract maximum value from food by-products and co-products.” It seems that in developed countries the majority of food waste occurs in the home, while in least developed nations food waste occurs between farm and market (due to lack of modern food processing technologies).

At the very end of the book, in fact in the last two paragraphs, we find out that food scientists go about their work devoid of...spoiler alert...love. “Tongue taste is the kind of easy, accessible flavor that *any food scientist* or manufacturer can reliably produce in order to make food appealing...,” Pollan quotes Hyeon Hee as saying [emphasis mine]. “Hand taste, however, involves something greater than mere flavor... Hand taste cannot be faked.” And “[w]hat hand taste is, [Pollan] understood all at once, is the taste of love.” And every *New York Times* journalist is as ethical as Jayson Blair⁴⁶.

On Control

⁴⁴ *Science*, 10 May 2013, p. 665

⁴⁵ <http://www.portlandmonthlymag.com/news-and-profiles/business/articles/whats-better-real-crab-or-real-krab-may-2013>

⁴⁶ <http://www.ajr.org/article.asp?id=3019>

Perhaps no other single concept is so prevalent in Pollan's writing⁴⁷ as that of control, a topic worthy of an essay of its own. Suffice it to say that sometimes control is good, "[t]he first thing anyone who cooks with live fire will tell you is that it all comes down to one word – 'control.'" Though mostly it's bad, "[t]he dream of control is seductive, but it leads straight to monoculture in the field and fortified white bread in the supermarket."

"Control you can just forget about. . . ." "In my [Pollan's] experience, gardening successfully depends on two different but related faculties, both highly relevant to baking. The first is the green thumb's ability to notice and absorb everything going on in his garden, from the precise tint of the leaves to the aroma of the soil. The data of your senses have more to tell you about the work than anything you can read in a book." (And Brawndo's got what plants crave, it's got electrolytes.⁴⁸) If the best way to garden, and cook, is by intuition, then why does Pollan "deploy a half dozen probes wired to oven thermometers in order to monitor the temperature in the pit and the pig. . ." and determine that the pig is done when "the internal temperature of the meat is approaching 190°F"? Probably to control his cooking for a consistently good product to please his guests.

Elitism

Plenty has been written on the elitist nature of Pollan's ideology,⁴⁹ and *Cooked* only reaffirms this. Pollan writes that "most of the rules of barbeque. . . are as arbitrary as the kashrut, rules for the sake of rules, with no rational purpose except to define one's community by underscoring its differences from another." You could probably replace "the kashrut" with "*Food Rules: An Eater's Manual*" and maintain the truth of this statement.

Pollan's Western, and narrowly American, perspective is revealed in statements like, "live-culture foods, which used to make up a large part of the human diet, have been relegated to the handful of artisanal producers and do-it-yourselfers signing up for Sandor Katz's 'cultural revival,'" and even more explicitly in the following paragraph.

It is true that this cooking was purely elective [referring to his own]. But nowadays, what cooking isn't? With fast- and convenience food so cheap and ubiquitous, cooking is hardly ever obligatory anymore, even among the poor. We all get to decide whether to cook, and increasingly, we decide not to.

But we can't all afford Chez Panisse, let alone a trip to Basque Spain to dine at Etxebarri. For Pollan cooking (and gardening) is a leisure time activity. Unlike most of the world's poor, Pollan isn't earning his living as a subsistence farmer or spending half his day on a search for water and wood to cook with.

Summary

One problem with the Western Diet Theory of All Ills, or as Pollan calls it "Grand Theory of Diet and Chronic Disease," is that it doesn't account for the increase of these maladies in non-Western countries. Along with the U.S., India, China, Indonesia and Japan round out the top five countries for number of people with diabetes and the highest rates occur in Arabia and North Africa.⁵⁰ Accepting the simple

⁴⁷ In this and also previous works.

⁴⁸ For those not familiar with *Idiocracy* see <http://www.youtube.com/watch?v=e1fKzw05Q5A>.

⁴⁹ Just Google "Pollan elitist"

⁵⁰ <http://e-medicaltextbook.blogspot.com/2008/08/diabetes-mellitus.html>

“processed foods = chronic disease” proposition prematurely closes avenues of inquiry such as the possibility that many of these maladies, including obesity⁵¹, are caused by infectious agents.⁵² We’ve gone down this path before with “The Lipid Hypothesis” that Pollan so roundly criticized in *In Defense of Food*.

What about cancer? “Everyday, moderate cooking techniques thus became as suspect as industrial-scale curing and overcooking,” says Harold McGee in *The Curious Cook*. However, McGee goes on, “all these reports have one important thing in common: they offer no direct evidence about the actual threat that a given food poses to human health.” He concludes that “add-a-vegetable optimism is built on shaky foundations...” and that “cooking is in some ways still a primitive craft, and that we might benefit from a greater awareness of and control over its chemical consequences.”⁵³

Some of the earliest identified and most aggressive carcinogens come from Nature. While re-reading Chapter 13 of *The Curious Cook*,⁵⁴ I was reminded of my early entry into the “food industry.” As a 9-year-old, I started a business making homemade root beer from Hires Root Beer Extract.⁵⁵ But saffrol, “the principal flavoring component of sassafras and a valued ingredient in root beer, was found to be carcinogenic in animals and was banned from food manufacturing.” Lucky for those of us who like root beer, a means of separating the saffrol from the flavor was developed.⁵⁶

Pollan’s writing is replete with Man-Nature dualism, “the wonderful refining alchemies of the kitchen demonstrate how far we have come as a species, affirming that we have indeed lifted ourselves out of nature... Cooking sets us apart, helps us to mark and patrol the borders between ourselves and nature’s other creatures...” But we went too far. Unlike the noble savage, for whom “cooking is not a turn away from nature,” modern man began “processing” food. Among the worst evils of food scientists Pollan writes, “[t]hey have always assumed they understood biology well enough to improve on the ‘unsophisticated foods of Nature,’ by taking them apart and then putting them back together again.” Separation and recombination. It sounds a lot like Samuel Taylor Coleridge’s “secondary imagination,” the faculty that “dissolves, diffuses, dissipates, in order to re-create,” that Pollan links with fermentation “as the necessary prelude to creating something new.”

Pollan wants us to become producers (*i.e.* cooks) instead of consumers,⁵⁷ to “row our way back to the firm shore that is nature.”⁵⁸ But the “natural” thing for any species to do is to consume and reproduce at its maximum rate until some external circumstance puts the breaks on.⁵⁹ I too resent being treated as a *mere* consumer, and this is not a blanket justification for all the food industry does, but “Nature” doesn’t give a hoot about the fate of man, and what we need now is *rational* discourse not *Pollan-mic* like that found in *Cooked*.

⁵¹ “Virus-induced Obesity in Humans” *Microbe*, Nov. 6, 2012, p. 263-267

⁵² See *Plague Time, The New Germ Theory of Disease* by Paul Ewald.

⁵³ More and more viral culprits are explaining a host of cancers.

⁵⁴ “Food and Cancer”

⁵⁵ My labels were printed on a mimeograph machine. Since a fermentation of sugar by yeast was used to produce the carbonation, this homemade root beer had some alcohol in it, which may have been responsible for its popularity.

⁵⁶ http://en.wikipedia.org/wiki/Hires_Root_Beer

⁵⁷ But someone must consume what we produce else it is wasted

⁵⁸ Ignorance?

⁵⁹ e.g. a lack of sugar in Pollan’s starter culture.