Hartman Venable was looking forward to this evening with a near perfect mixture of dread and delight. Since he had arrived in St. Jerome (an important Southwestern city where Mr. Venable had been sent as a minister), he had crossed paths with Ezra Micajah Parsons a few times—in the street, at a mutual acquaintance’s house, at church. Each time, the encounter had left Mr. Venable curious, bewildered, and a little speechless. Curious because Mr. Parsons had been described to him as the originator of “dozens of inventions”—an amphibious (“terraqueous”) machine, a paddle-free steamboat (“a dead failure”), and a preparation of concentrated meat (“Focussed Flesh”). Bewildered because the encounters had all been ended rather abruptly—and rather one-sidedly—by Mr. Parsons. And speechless because it had been nearly impossible to get a word in, as Mr. Parsons had talked incessantly, without pause or pity for his listener. At some point, in between one rapid succession of sentences and the next, Mr. Parsons had gleaned enough presence of mind to finally ask Mr. Venable to dinner.

Mr. Parsons’ house lay quite a walk away in the suburbs of St. Jerome, but Mr. Venable could spy it from a distance, with its observatory and flagstaff towering over the roof. The house was surrounded by a good ten acres of land enclosed with a high fence. As soon as Mr. Venable reached the gate, Mr. Parsons stormed out, greeted his visitor, and ushered him inside. Mr. Venable had barely been introduced to Mrs. Parsons (“my second wife”) and their daughter Alice (“our owny one”) when Mr. Parsons handed him a plate of soup. “It is a fat hen which I condensed with my own hands not three months ago,” Mr. Parsons declared; “more nutritive food never was
eaten.” Mr. Venable dutifully ate what he quickly identified as chicken soup, though his assertions that this was “good soup, excellent soup” were insincerely given. There was nothing inherently wrong with the meal except “a hazy sort of doubt which seemed to rest, like a fog, upon the taste thereof.” Besides, he had never cared much for chicken soup and had always known it as invalids’ food. Mr. Parsons’ wife and daughter seemed to share Mr. Venable’s sentiments: “Our little Owny here and I never touch it,” Mrs. Parsons assured him. “We don’t believe in his inventions, sir,—not one bit.” She did, however, hasten to add that she had faith in his motives.

After dinner, Mr. Parsons invited Mr. Venable to take a stroll around the gardens. Mrs. Parsons waved them off with a stern warning to Mr. Venable not to go on her husband’s machine, “as you value your life.” Mr. Venable thanked her for the meal and followed his host who had already departed for the grounds. The two men walked for a long while, passing a fig orchard, a banana grove, and various groups of lemon, orange, and almond trees. They finally reached a sort of warehouse, and Mr. Parsons begged his guest to step inside. A large baker’s oven stood in the middle of the dark, humid room, surrounded by tables and heaps of boxes. Mr. Parsons then picked up a small cracker from a pan on one of the tables and showed it to his visitor. “What do you suppose this is?” he asked Mr. Venable. Puzzled, Mr. Venable guessed that it was a soda cracker. “No, sir,” Mr. Parsons triumphantly cried, “That is a spring chicken!” In detail, Mr. Parsons proceeded to describe the process by which he had turned a chicken into a cracker. “I boil the chicken in a vacuum, extract every atom of bone and fibre, leaving the essential chicken itself,” he explained. The extracted chicken would then be baked in a pan, expelling all superfluous water. “What is left is intensely and exclusively chicken,” Mr. Parsons exclaimed proudly. Dropping the chicken in a pot of boiling water would transform it into a nourishing soup, just like the one Mr. Parsons had served for tonight’s dinner. “One chicken to a cracker” and “exactly twelve chickens to a pan,” Mr. Parsons explained, was the precise ratio of concentration.

Not only chicken but beef, “a calf, and a fat one,” and “a whole barnyard of pigs” had been boiled down and put into boxes by Mr. Parsons. “And what do you think that is?” Mr. Parsons asked, picking up another fragment from a slightly bigger pot. “Bite it, and see,” he coaxed Mr. Venable. Unable to await Mr. Venable’s guess, Mr. Parsons solved the tasting riddle. “That is a turkey,” he proclaimed; “a whole drove of turkeys in those pans.” Mr. Venable dutifully expressed his astonishment, and in return, was treated to
a full exposition of the inventor’s ambitions. “In a few years the armies and especially the navies of the world will be fed upon my food,” Mr. Parsons prophesied. “It will be by reason of my invention that the North Pole and the South will be discovered.” Everything, simply everything the inventor could get his hands on—“a potato into a pill-box, a pumpkin into a tablespoon, the biggest sort of watermelon into a saucer”—would be condensed by Mr. Parsons. “The day will come,” he promised, “when a distiller will have learned from me to put a whole vineyard into a barrel.”

He then paused briefly, an act so uncharacteristic for Mr. Parsons that it startled Mr. Venable. But it had its desired effect, for Mr. Venable found himself listening closely to Mr. Parsons triumphant conclusion: “What I want to say is this: The world is changing. In the direction of condensing.”

The story above is taken from a semi-fictional account by William Mumford Baker, a Presbyterian minister who, in 1849, spent a year at Galveston, Texas, as assistant pastor to the local church. The protagonist, Mr. Venable, was likely modeled after Baker himself, while the local inventor, Mr. Parsons, was almost certainly based on Texan surveyor, newspaper editor, and inventor Gail Borden (1801–1874), who is perhaps best known today as the creator of condensed milk. Though unique in its explicitly fictional orientation, it was not the first account of Gail Borden and his condensed foods, nor would it be the last. Over time, the reasons for telling Borden’s story shifted. At the height of the US-American consumer revolution in the 1950s, biographers turned to condensed milk as an iconic American brand and to Borden as a personification of the American dream, symbolizing “the log-cabin-to-mansion quality which nineteenth-century Americans believed was their peculiar belonging.” More recent writers saw in Gail Borden’s condensed milk a symbol of the origins of industrialized food and the decline of the American diet. Convenient, processed, and opaque, canned milk stood for a growing lack of transparency, an increasing focus on consumer advertising, and a proliferation of unhealthy eating habits.

Common to most accounts, including Baker’s semi-fictional tale, is a depiction of Borden somewhere between admiration and ridicule: a sincere innovator on the one hand, “consumed with a passion for research, and a desire to improve daily life”; a hopeless tinkerer, on the other, who got lucky once (with condensed milk), while his other ideas were a series of “ludicrous
failures,” the meat biscuit chief among them. A concoction that not only sounded rather distasteful to modern ears but was ultimately a commercial failure, the biscuit fitted awkwardly into tales of American entrepreneurial success and histories of tasty but innutritious convenience foods alike. But the meat biscuit was not just a harmless if eccentric precursor of condensed milk, nor was Borden merely a well-meaning, pipe-dreaming tinkerer with his head in the clouds and his heart in the right place.

The meat biscuit was, above all, a technology of empire, and its inventor a willing participant in the US imperial project. Together with his business partner, Ashbel Smith, a physician, soldier, and politician, Borden designed and promoted the biscuit specifically to serve the needs of Manifest Destiny, to advance American economic development, and to facilitate the displacement and extermination of the North American continent’s Native inhabitants. The need to provide traveling armies and ships with portable and durable rations had long inspired the search for portable foods. But the meat biscuit promised an entirely new approach to nourishment that would enable military mobility and nutritive concentration on a previously unprecedented scale. Through products like the meat biscuit (of which there were many), food experts and entrepreneurs were grasping for a way to locate the nourishing function of food in its subcomponents and create highly nourishing consumables of significantly lesser weight and bulk. This shift toward a constituent-based approach to nourishment, a crucial aspect of our contemporary understanding of nutrients and food groups, did not develop in a vacuum, nor was it advanced with a dispassionate eye toward improving health or advancing scientific nutritional knowledge. Instead, those ideas arose in part to serve imperial and economic ends that were specific to the historical context in which the meat biscuit and similar products were developed.

Crucial to the initial success of the meat biscuit (and responsible for its ultimate failure) was the imperial-military economy that had emerged in conjunction with US expansion across the continent and functioned as an important market for the biscuit. Borden and Smith cultivated ties to important military figures and bartered for a supply contract for their invention. The resulting military correspondence reveals that the biscuit’s imperial profile was not merely a promotional strategy devised by Smith and Borden but an idea that resonated with military and political officials at the highest levels of empire and government. At the same time, the biscuit embodied a vision of civilizational progress and a promise of economic development.
The biscuit’s processed character and its potential to be manufactured on a grand scale accorded it a place in debates about the relationship between resource abundance and national prosperity (as well as renown beyond the United States, which will be discussed in chapter 2).

**GAIL BORDEN, IMPERIAL ENTREPRENEUR**

In April 1850, Gail Borden boarded a steamship from Galveston to New Orleans, and from there traveled up the Mississippi River to St. Louis. As his boat joined the line of ships that curved around the river’s bend waiting to dock, he had time to observe the city’s impressive outline against the gray April sky. The city rose from the river in two soft plateaus of limestone, first abruptly, then gradually, until it reached a modest height of sixty feet above the water. Borden had seen the first houses of the suburbs emerge from the city’s deforested surroundings ahead of their approach. But now he observed—with the keen eye of the surveyor—that most of the brick-and-wood dwellings of the city center were crammed into a thickly settled space of two and a half by one and a quarter miles. Clearly, the city had not been built in full anticipation of its rapid expansion. In a mere forty years, the population had grown from 1,400 in 1810, to 77,850 in 1850. This proliferation of St. Louis reflected its place as the “imperial capital of the ‘white man’s country’ of the West” and the linchpin of its export-driven military-agricultural economy. Below, on the landing, dock workers hauled large quantities of molasses, lead, and fur from wagons onto steamships and barrels of wheat, corn, oats, pork, beef, and cheese from steamships onto wagons. St. Louis was the gateway that connected the raw abundance of the American continent to markets, empire, and prosperity.

Borden had come here precisely to profit from this connection. He wished to put the biscuit into the hands (and mouths) of influential military men who might secure its future as a technology of empire. Borden himself, in one capacity or another, had spent much of his life contributing to the territorial expansion of white settler America. Born in 1801 in Norwich, New York, Borden passed a considerable portion of his youth moving ever westward. In 1829, he was granted over four thousand acres of land from the Mexican government in Texas and moved there with his family. In Texas, Borden farmed, kept livestock, and worked as a surveyor. His surveying skills earned him several important positions, including an appointment by
Stephen F. Austin to conduct an official survey of the Texan colony. Borden also worked in the land grant business. He was put in charge of the General Land Office at San Felipe under Austin and later worked for the Galveston City Company. In the port city of Galveston, for which he provided the first map, Borden ultimately settled down and built his meat biscuit business.9

Mexico’s liberal settlement policy, from which Borden profited, was rooted in a desire to secure what was perceived to be an unstable border region between the republics of the United States and Mexico. It sought to encourage white population growth and thereby dilute the existing Native population to the West. But incoming white US settlers preferred the East for its closeness to important trade routes and to the cotton planting states. They also came in ever greater numbers, so that Mexico finally prohibited Anglo-American settlers from entering Texas in 1830.10 This caused consternation among the settlers. Many white settlers also brought the people they had enslaved with them, and Borden was no exception.11 The abolition of slavery in Mexico in 1829 further enraged white US settlers, and they began to organize rebellious activities against the Mexican government, culminating in a proclamation of Texan independence from Mexico in 1836.12 The conflict over Texas escalated when the United States announced its intention to annex the Texan territory and followed up with a declaration of war on Mexico in 1848.

The result of the Mexican-American War was the so-called Mexican Cession, the second largest acquisition of land by the United States at that time after the Louisiana Purchase. Populated with an ethnically and religiously diverse set of inhabitants, this territory frightened US imperialists as much as it excited them; it offered land but also seemed to threaten the cohesion and stability of the republic. While the decision to go to war over such heterogeneous territories had been contested, the need to settle them now with white Americans seemed indisputable.13

Borden’s own biography was inextricably linked to these developments of US imperialism. Borden was a delegate to the 1833 convention in San Felipe which petitioned the Mexican government for a repeal of the settlement prohibition.14 During the armed conflict resulting in the declaration of Texan Independence, Borden published the region’s only newspaper, a mouthpiece for resistance against the Mexican government.15 Letters from this period attest to Borden’s continuous shortage of money and the financial difficulties under which he ran his printing business. Even so, he eagerly insisted that any refusal on his part to accept more free printing before payment did not
imply that he was “less attached to the cause in which Texas has been engaged,” or that he “would withhold any aid which it would be in my power to render my country.”

Borden’s business partner, Ashbel Smith (1805–1886), played an even more prominent role in the political and imperial aspirations of the mid-nineteenth-century United States. A physician, statesman, and soldier, Smith had studied medicine at Yale University, and had afterward toured the scientific hubs of Europe for three years (as one did in those days in order to become a successful doctor). Upon his return in 1836, he joined the Texan insurgence as surgeon general of the Texan Army. Like Borden, he held government posts in the early Texan Republic after the fighting; he served as the Republic’s ambassador to Britain from 1841 to 1845 and as secretary of state in 1845. In this capacity, he secured a treaty of amity and commerce between Texas and Britain. During the Mexican-American War, Smith served again as surgeon general of the US Army. A close friend of Sam Houston, he was selected to represent Texas during the 1851 Great Exhibition in London, where the meat biscuit would be exhibited (chapter 2).

Smith was also an outspoken white supremacist. He repeatedly declared that the “Anglo-Saxon race” was “the most vigorous offshoot of the whole human family,” and “genius, moral and intellectual power” were its prerogative alone. The Mexican-American War, in Smith’s opinion, was only the inevitable fate of that race to “overrun and possess in perpetuity the vast region extending from our southern boundary to the Isthmus of Panama” in order to “civilize” and “Americanize” “degenerate Mexico.” These beliefs were not merely private opinions but firmly held convictions that informed his political and commercial activities. In 1844, for instance, he vocally defended the institution of slavery against British abolitionist voices to the British foreign secretary, expressing in no uncertain terms “the explicit disapproval by the Texan government of all proceedings having for their object the abolition of slavery in Texas.”

Borden probably approached Smith strategically for Smith’s intellectual and personal connections to medicine and to the US military. Smith maintained a medical practice in Galveston and wrote a widely cited account of the 1839 yellow fever epidemic. He was a member of the American Society for the Advancement of Science and of the New York Academy of Medicine. His plantation home boasted a private medical library, which Borden allegedly visited regularly according to one biographer. As surgeon general during the Mexican-American War, Smith would have come into contact with
influential figures in the US Army. All of this made him a formidable ally for Borden’s meat biscuit venture. As did his capital: Smith likely invested the considerable sum of five hundred dollars in the meat biscuit business.\textsuperscript{25}

Borden and Smith shared an interest in food and agricultural experimentation. On his plantation, Smith raised chickens and grew corn and sugar (a crop he believed would be more profitable to Texas than cotton).\textsuperscript{26} Food was of vital importance to the American economic and white supremacist project, and Southern planters like Smith were acutely concerned with the food supply. During the 1840s and 1850s, they imported large quantities of food from the Midwestern United States to avoid sacrificing valuable acreage of potential cotton fields to the production of meat and other food. But lack of food, in the minds of planters, also carried the risk of revolt by enslaved people—easily the most dreaded specter for many nineteenth-century American enslavers.\textsuperscript{27} As a result, the search for more efficient means of food production and procurement became a primary concern for planters.\textsuperscript{28}

Long before the production of the meat biscuit, Borden and Smith were engaged in experimental agricultural activity with the explicit aim of maximizing the availability of nourishment in a limited space. One of their joint ventures involved the Rohan potato, a crop famed for its high yield and “productiveness” among European and US farmers.\textsuperscript{29} According to the \textit{Gardiner’s Magazine}, the Rohan promised “much from the bulk produced in feeding cattle.” It was unclear, however, whether “more nutritive matter per acre” might not be produced from less “bulky” varieties, and so the Rohan joined a long list of crops and animals tested for their nutritive potential against their spatial requirements in the mid-nineteenth century.\textsuperscript{30}

Food was also crucial to realizing American imperialist ambitions and achieving the Jeffersonian Dream. Creating a nation of incorrupt, self-sufficient men required spatially expanding white settlement areas and freezing economic development at the stage of yeomanry.\textsuperscript{31} This involved transforming vast stretches of cultivated, inhabited territory into “virgin soil” and “the West” by emptying it of its peoples and fortifying it with costly and bulky military operations. Such operations, in turn, depended on a light, portable, heat-resistant, and above all, highly nourishing food supply. It was this goal that had brought Borden to St. Louis in April 1850. With the meat biscuit, Smith and Borden responded to the military and imperial demand for concentrated nourishment. In so doing, they raised questions about how precisely the nourishing function of a food related to its size and weight.
Today, we understand the nourishing power of foods mostly through what they contain. We think of proteins and fats and carbohydrates and vitamins and minerals. We think of food as made up of subcomponents, nourishing constituents, which, through their quantity, determine the nutritiousness and healthfulness of a food. Nutrition labels help us select foods that contain more of a particularly desirable nutrient, such as high-fiber cereal, omega-3-fortified margarine, or orange juice rich in vitamin C. All of these products suggest that determining a food’s nutritiousness is best done by analyzing its content of “nutrients” and measuring their quantity. Gyorgy Scrinis has coined the term *nutritionism* to describe this nutrient-centric understanding of foods’ nourishing effect, which also allows for easy commercialization. Nutritionism, according to journalist and food writer Michael Pollan, has become a quintessential characteristic of modern nutritional thinking, an indication of the degree to which scientific vocabulary and commercial interests have permeated, and perhaps corrupted, our relationship to food.

There is no doubt that food contains distinct biochemical components and that these biochemical components play an important role in nourishing human bodies. Scientists have developed more and more reliable methods for measuring vitamins, minerals, and proteins, and have linked a lack of these components to nutritional deficiency diseases such as scurvy, beriberi, or rickets. But while humans require a minimum of essential nutrients, there is no evidence that exceeding the required amount of most food components leads to better health. On the contrary, excessive quantities of many nutrients such as vitamin D or protein are likely to do more harm than good. The notion that nourishment can be thought of on a scale, a quantifiable measure that corresponds directly to degree of nutritiousness, is a relatively new idea, not fully articulated until the nineteenth century, and it is rooted in culture as it is in science. Borden and Smith’s meat biscuit and other concentrated foods were a part of this development.

Until the eighteenth century, the nutritiousness of food was understood primarily as a function of its *kind* rather than its *content*. Whether a food was animal or vegetable, fresh or ripe, sweet or sour, watery or dry, determined its nature, its quality, its *essence*, and therefore its effect on the bodies of eaters. Rather than an assemblage of distinct nutrients, nourishment was thought to consist of a single nourishing matter. All foods contained it,
whether they were vegetables or fruits or meat or bread or cheese. This nourishing matter circulated through the natural world in a grand cosmological cycle: plants would take their nourishment from the earth, animals fed on plants, and humans fed on animals. As nourishing matter thus circulated through the hierarchy of beings, it would undergo a continuous process of change, rendering it more and more nourishing.

At the heart of this notion of gradual, qualitative change of a single nourishing substance lay long-standing ideas about the transformation of matter as a process of “refinement,” or “elaboration.” Everyday transformative processes that could be observed in practices like distillation, fermentation, or cooking provided models for imagining the alteration of edible matter in the body. Similarly, chemical examination techniques, most importantly distillation analysis, offered ways of grasping (both materially and metaphorically) the nature of substance transformation. For centuries the primary method for investigating the properties of matter, distillation analysis involved the application of heat, a known transformative agent, to produce a progressive change in the substance analyzed. Over successive stages of distillation, a single material would be transformed into an ever more refined substance. In the process, the transformed substance would yield distinct products of distillation—water, spirits, oils, salts, and earth—that would be captured and analyzed. These products, however, were not considered the component parts of a particular substance so much as the “elementary principles of all matter.” Since there were four known elements or essences that could be stripped away from any examined substance during distillation, the final distilled substance was also referred to as the fifth element or fifth essence. Our contemporary word “quintessence” still echoes this original meaning. Accordingly, the process of transformation was not one of disassemblage, an isolation of preexisting ingredients from a composite mix. Rather, it was a gradual metamorphosis of a substance into the purest, most “essential,” most characteristic version of itself.

Culinary techniques mirrored this understanding of substance transformation. The application of heat in cooking gradually delivered food from its coarse and earthy nature, releasing its essence, its nutritive core. Eighteenth-century cooks produced versions of elaborated and concentrated nourishment, such as broths, soups, gravies, reductions, so-called “restaurants,” and even “quintessences.” Historian Emma Spary has coined the term hyper-nourishment to refer to such foods consisting of rich versions of themselves. “Unearthing” the nutritive essence of food in this manner did not necessarily
lead to a quantitative reduction of its weight or bulk; instead, it was embed-
ded in a logic of qualitative transformation, with the aim of developing, in-
tensifying, refining, and transubstantiating food’s substance and flavor.42

Cookery, in turn, anticipated and imitated what happened to food in-
side bodies. It functioned as an extension of the digestive process, and the
digestive process was governed by the same logic of distillation analysis as
cooking itself. In digestion, distant natures—of mineral, plant, and animal
origin—were converted into the essence of the eater in a process of gradual
elaboration. It was an operation toward achieving refinement, purity, com-
plexity, and above all, similarity of matter—a process of assimilation.43 In this
cosmology, what counted as nourishing was determined by a food’s degree of
similarity in kind to the eater. Similar substances required less “elaboration”
to be made into human bodily tissue; animal food was believed to be more
easily digestible, and therefore more nourishing, than plant food. Eighteenth-
century dietetic manuals and chemical texts on foodstuffs tended to be ar-
ranged by categories of kind: a typical table of contents would distinguish
animal from vegetable food, liquid from solid food, and different kinds of
meats and vegetables from one another.44 Taste, because it signaled the simi-
larity of edible substances with the constitution of the eater, was regarded as
a sign of the nourishing potential of certain foods for the individual ingester.
Rather than an antithesis to nutritional value, taste was an indicator of it. The
development and intensification of flavor in cooking practices was therefore
an integral part of rendering food more nutritious.45

But from the late eighteenth century, a profound change in how nourish-
ment was understood and examined was underway, one that located nour-
ishment in distinct food components. Historians of food and science have
described several developments that contributed to this shift in understand-
ing. A broader process of scientific secularization, the growing dominance of
chemistry in the sciences and in public life, and new chemical techniques of
analysis certainly “opened up organic substances, like food, to the gaze of the
chemist,” and a scientific “discourse on nutrition” subsumed and secularized
moral and religious notions of food.46 At the same time, food had long been
probed within modern chemistry’s predecessor, chymistry (or alchemy),
which was by no means an occult or fringe practice, but a mainstream sci-
entific enterprise. In order to understand the shift toward content-centric
theories of nutrition, we therefore must also look to changes within the
discipline of chemistry itself, as well as to the broader historical context in
which these changes occurred.47
For one, animal and plant chemistry were increasingly practiced within the professional contexts of pharmacy and medicine, and animal and vegetable substances were probed more and more for their medicinal and pharmaceutical purposes. Added to that was the challenge posed by plant materials bioprospected from Europe’s expanding empires. A growing number of such substances, previously unknown to European scientists, had to be incorporated into European pharmaceutical and botanical systems, a task for which European colonists often relied on indigenous knowledge of a substance’s uses. These professional and material changes were paralleled by a growing concern with existing methods of analysis. Whereas previously, chemists had overwhelmingly relied on their senses to determine a substance’s essence, they now began to privilege the role of function or virtue in revealing a substance’s nature. As sensory analysis thus gave way to an emphasis on use, distillation analysis came under attack for destroying, rather than revealing, the essence of matter. Instead, chemists relied more and more on solvent extraction, a method of analysis they regarded as a less radical transformation of a plant’s virtues. Solvent extraction consisted in the use of water or alcohol to separate the so-called proximate principles of plant matter, those components that plants would yield upon being subjected to solvent analysis. Whether the extracted substances were the ultimate components of plant matter or were themselves composed of even smaller particles was a matter of debate. But either way, solvent extraction relied on, and reinforced, the notion that a plant contained distinct components, and that chemical extraction was merely a process of separation.

“Extracts” of matter therefore came to displace “essences” in the epistemic logic of matter analysis, and the products of extraction were systematically examined for their respective subcomponents and possible functions. The domain of food and nutrition was no exception. From the early nineteenth century, chemists probed foods for their components, and components for their physiological role in nutrition. In 1827, chemist William Prout categorized the proximate principles found in animals and plants into three major “alimentary principles”—the saccharine, the oily, and the albuminous—and declared that all were equally necessary to human nutrition. Others homed in on single constituents as the primary seat of nourishment. French physiologist François Magendie examined the role of the chemical element nitrogen in 1816 by feeding dogs solely on sugar, a substance considered nutritious at the time, but that contained no nitrogen. The dogs soon developed symptoms of disease, and some even died. Magendie concluded that sugar alone...
was incapable of nourishing dogs, and that nitrogen played a central role in nourishment.\textsuperscript{54} German chemist Justus von Liebig also emphasized the role of nitrogen in the human diet and asserted that nitrogen was the chemical substance responsible for the true nourishing function, the building up of the body’s tissues (which we no longer believe is true). Liebig also described an extraction method for meat—essentially a solvent analysis—that supposedly yielded the nourishing constituents of meat more reliably than previous methods of cooking.\textsuperscript{55} But it would soon come under attack precisely because it did not contain enough of the very substance Liebig had identified as the seat of nourishment, nitrogen.\textsuperscript{56}

By the time Gail Borden began working on his meat biscuit, then, the possibility of identifying nourishing constituents was a widespread hope. But how exactly the nourishment-carrying subcomponents of food could reliably be extracted, or how those subcomponents carried out their nourishing function, was far from resolved. No sooner were nutritious subcomponents raised as a possibility, however, than the idea of concentrating them into a single food and thereby producing a highly nourishing yet light form of nourishment took shape. It materialized and drove nutritional knowledge production even before the precise seat of nourishment had been agreed on. Understanding the transition toward a constituent-based conception of nourishment therefore also requires asking why the idea of compact nourishment gained such traction during this period. The view toward chemistry might reveal what happened en route to a constituent-based approach to food. But it is the imperial and economic contexts of products like the meat biscuit that indicate why content-centric questions about nourishment were asked so insistently in the first place.

\textit{“The Original Inventor of Focussed Flesh”}

Although all Borden’s surviving claims about the meat biscuit suggest that he alone was the “original inventor of Focussed Flesh,” crucial knowledge and inspiration for the product likely came from a different source.\textsuperscript{57} According to historian Joe B. Frantz, one “not altogether reliable version” of the origin of the biscuit involved a Comanche food called \textit{pinole}.\textsuperscript{58} A Dutch merchant friend of Borden had apparently gifted Borden some of the food, supplied by the merchant’s frontier trader from San Saba, Texas. Pinole consisted of “powdered, pulverized, dried buffalo meat, dried crushed hominy
and mesquite beans.” It could be “eaten dry or moistened and pre-pared as a cake.” It could also serve as a travel food, “compound into a buffalo gut” and “worn as a belt.” Unfortunately, Frantz does not cite any evidence for his claim, nor does the archival record hold any sources confirming a Native genealogy of the meat biscuit. But the use of a food by the name of “pinole” (from the Aztec word pinolli) made from ground grain or maize and used for travel was well-documented among Native peoples in the nineteenth-century Southwest, particularly those with a nomadic way of life.59 The Comanche peoples were also famous for their knowledge of curing meat, a skill practiced in particular by the women of the tribe.60 Portable buffalo meat preparations like Pemmican were widely traded and well-known by the 1840s, though the high fat content of Pemmican rendered that Northern preparation of lesser use in the warm climates of the South, where it spoiled easily.61 Given all this, it is not unlikely that a portable Native food combining meat and ground corn or grain flour found its way into Borden’s hands and mouth. It is also not difficult to imagine that, if this was the case, Borden would have thought it unnecessary to credit the Native knowledge he had drawn on for his “invention.”

Instead, Borden credited a combination of serendipity and ingenuity (that clichéd mechanism of innovation) for the creation of the meat biscuit. He declared that in July 1849 he had been “attempting to prepare some portable food for a few friends going to California,” and in the process, had “made an important discovery, to wit.”62 Having “set up a large kettle and evaporating pan,” he had reduced “one hundred and twenty pounds of veal” to “ten pounds of the extract” in the space of two days. But the consistence of the condensed product was that of “melted glue and molasses,” and the weather being “warm and rainy” in the middle of July, he had trouble drying it. It then “occurred” to him to “mix the article with good flour and bake it.” To his “great satisfaction,” the resulting product contained “all the primary principles of the meat.”

Borden never indicated precisely what he meant by “the primary principles of the meat,” nor did he mention how (or if) he went about measuring them. To an extent, his conception of nourishment seems to have been rooted in the qualitative tradition of eighteenth-century hyper-nourishing essences. Borden’s method of applying heat and boiling animal flesh over a long period of time echoed the production of pre-nineteenth-century broths, reductions, and quintessences. Even his ambitions to improve his method through “the employment of suitable apparatus” by which “the
The nutritious properties of the meat” would be “separated from the corporeal parts by steam” merely copied older culinary techniques and theories of transformation in the form of the eighteenth-century “digester,” a sort of pressure cooker used to prepare flavorful, nutritious essences of meat and bone. Borden also acknowledged Samuel Frederick Gray’s 1828 *The