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The Ruination of the Tomato

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It wasn't a conspiracy, it was just good business sense—but why did modern agriculture have to take the taste away?

Sagebrush and lizards rattle and whisper behind me. I stand in the moonlight, the hot desert at my back. It's tomato harvest time, 3 A.M. The moon is almost full and near to setting. Before me stretches the first lush tomato field to be taken this morning. The field is farmed by a company called Tejon Agricultural Partners, and lies three hours northeast of Los Angeles in the middle of the bleak, silvery drylands of California's San Joaquin Valley. Seven hundred sixty-six acres, more than a mile square of tomatoes—a shaggy, vegetable-green rug dappled with murky red dots, 105,708,000 ripe tomatoes lurking in the night. The field is large and absolutely level. It would take an hour and a half to walk around it. Yet, when I raise my eyes past the field to the much vaster valley floor, and to the mountains that loom farther out, the enormous crop is lost in a big flat world.

This harvest happens nearly without people. A hundred million tomatoes grown, irrigated, fed, sprayed, now taken, soon to be cooled, squashed, boiled, barreled, and held at the ready, then canned, shipped, sold, bought, and after being sold and bought a few more times, uncanned and dumped on pizza. And such is the magnitude of the vista, and the dearth of human presence, that it is easy to look elsewhere and put this routine thing out of mind. But

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that quality—of blandness overlaying a wondrous integration of technology, finances, personnel, and business systems—seems to be what the “future” has in store.

Three large tractors steam up the road toward me, headlights glaring, towing three thin-latticed towers that support floodlights. The tractors drag the towers into place around an assembly field, then hydraulic arms raise them to vertical. They illuminate a large, sandy work yard where equipment is gathering—fuel trucks, repair trucks, concession trucks, harvesters, tractor-trailers towing big open hoppers. Now small crews of Mexicans, their sunburns tinted light blue in the glare of the three searchlights, climb aboard the harvesters; shadowy drivers mount tractors and trucks. The night fills with the scent of diesel fumes and with the sound of large engines running evenly.

The six harvesting machines drift across the gray-green tomato-leaf sea. After a time, the distant ones come to look like steamboats afloat across a wide bay. The engine sounds are dispersed. A company foreman dashes past, tally sheets in hand. He stops nearby only long enough to deliver a one-liner. “We’re knocking them out like Johnny-be-good,” he says, punching the air slowly with his right fist. Then he runs off, laughing.

The nearest harvester draws steadily closer, moving in at about the speed of a slow amble, roaring as it comes. Up close, it looks like the aftermath of a collision between a grandstand and a San Francisco tram car. It’s two stories high, rolls on wheels that don’t seem large enough, astraddle a wide row of jumbled and unstaked tomato vines. It is not streamlined. Gangways, catwalks, gates, conveyors, roofs, and ladders are fastened all over the lumbering rig. As it closes in, its front end snuffles up whole tomato plants as surely as a hungry pig loose in a farmer’s garden. Its hind end excretes a steady stream of stems and rejects. Between the ingestion and the elimination, fourteen laborers face each other on long benches. They sit on either side of a conveyor that moves the new harvest rapidly past them. Their hands dart out and back as they sort through the red stream in front of them.

Watching them is like peering into the dining car of a passing train. The folks aboard, though, are not dining but working hard for low wages, culling what is not quite fit for pizza sauce—the “greens,” “molds,” “mechanicals,” and the odd tomato-sized clod of dirt which has gotten past the shakers and screens that tug tomato from vine and dump the harvest onto the conveyor.

The absorbing nature of the work is according to plan. The workers aboard this tiny outpost of a tomato sauce factory are attempting to accomplish a chore at which they cannot possibly succeed, one designed in the near past by some anonymous practitioner of the new craft of *management*. As per cannery contract, each truckload of tomatoes must contain no more than 4 percent green tomatoes, 3 percent tomatoes suffering mechanical damage from the harvester, one percent tomatoes that have begun to mold, and .5 percent clods of dirt.

“The whole idea of this thing,” a farm executive had explained earlier

in the day, “is to get as many tons as you can per hour. Now, the people culling on the machines strive to sort everything that’s defective. But to us, that’s as bad as them picking out too little. We’re getting \$40 to \$47 a ton for tomatoes—a bad price this year—and each truckload is 50,000 pounds, 25 tons, 1100 bucks a load. If we’re allowed 7 or 8 percent defective tomatoes in the load and we don’t have 7 or 8 percent defective tomatoes in the load, we’re giving away money. And what’s worse, we’re paying these guys to make the load too good. It’s a double loss. Still, you can’t say to your guys, ‘Hey, leave 4 percent greens and one percent molds when you sort the tomatoes on that belt.’ It’s impossible. On most jobs you strive for perfection—They do. But you want to stop them just the right amount short of perfection—because the cannery will penalize you if your load goes over spec. So what you do is run the belt too fast, and sample the percentages in the output from each machine. If the load is too poor, we add another worker. If it’s too good, we send someone home.”

The workers converse as they ride the machine toward the edge of the desert. Their lips move in an exaggerated manner, but they don’t shout. The few workers still needed at harvest time have learned not to fight the machine. They speak under, rather than over, the din of the harvest. They chat, and their hands stay constantly in fast motion.

Until a few years ago, it took a crowd of perhaps 600 laborers to harvest a crop this size. The six machines want about a hundred workers tonight—a hundred workers for 100 million tomatoes, a million tomatoes per worker in the course of the month it will take to clear the field. The trucks come and go. The harvesters sweep back and forth across the field slowly. Now one stands still in midfield. A big service truck of the sort that tends jet planes drives across the field toward it, dome light flashing. It seems that whatever breaks can be fixed here.

After the first survey, there is nothing new to see. It will be this way for the entire month. Like so many scenes in the new agriculture, the essence of this technological miracle is its productivity, and that is reflected in the very uneventfulness of the event. The miracle is permeated with the air of everyday-ness. Each detail must have persons behind it—the inventions and techniques signal insights into systems, corporate decisions, labor meetings. Yet contracts, phone calls, handshakes, hidden skills, management guidelines. Yet the operation is smooth-skinned. Almost nothing anyone does here requires manual skills or craft beyond the ability to drive and follow orders. And everyone—top to bottom—has his orders.

The workday mood leaves the gentleman standing next to me in good humor. We’ll call him Johnny Riley, and at this harvest time he is still a well placed official at this farm. He is fiftyish and has a neatly trimmed black beard. His eyebrows and eyelashes match the beard, and his whole face, round, ruddy, and boyish, beams behind heavy, black-framed glasses. He’s a glad-

hand, a toucher, with double-knit everything, a winning smile that demands acknowledgement, and praise to give out. It is enjoyable to talk with him.

"There are too many people out here on the job with their meters running. We can't afford trouble with tomato prices so low. If something hasn't been planned right, and it costs us extra money to get it straightened out, it's my ass," he says.

The tomato harvester that has been closing for some time, bearing down on our outpost by the edge of the field, is now dangerously near. Behind the monster stretches a mile-and-a-quarter-long row of uprooted stubble, shredded leaves, piles of dirt, and smashed tomatoes. Still Johnny Riley holds his ground. He has to raise his voice to make himself heard.

"I don't like to blow my own horn," he shouts, "but there are secrets to agriculture you just have to find out for yourselves. Here's one case in point. It may seem small to you at first, but profits come from doing the small things right. And one of the things I've found over the years is that a long row is better. Here's why. When you get to the end of a row, the machine here. . . ." Riley gestures up at the harvester, notices our plight, and obligingly leads me to one side. He continues, ". . . the machine here has to turn around before it can go back the other way. And that's when people get off and smoke. Long rows keep them on the job more minutes per hour. You've got less turns with long rows, and the people don't notice this. Especially at night, with lights on, row length is an important tool for people management. Three-fourths of the growers don't realize that. I shouldn't tell you so—it sounds like I'm patting myself on the back—but they don't."

And sure enough, as the harvester climbs off the edge of the tomato field and commences its turn on the sandy work road, the crew members descend from the catwalk, scramble to the ground, and light up cigarettes. Johnny Riley nods knowingly to me, then nods again as a young fellow in a John Deere cap drives out of the darkness in a yellow pickup to join us in the circle of light the harvester has brought with it. It's as if he arrived to meet the harvester—which, it turns out, is what he did do. He is introduced as Buck Klein. Riley seems avuncular and proud as he talks about him.

"He's the field supervisor. Just a few years ago he was delivering material for a fertilizer company. Soon he was their dispatcher, then took orders. He organized the job. He came here to do pesticides, and we've been moving him up." Buck Klein keeps a neutral face for the length of this history, for which I admire him. He is of average height, sturdily built, sports a brush moustache that matches his short, dark blond hair. He wears a western shirt, a belt with a huge buckle that says "Cotton" on it, and cowboy boots. He has come on business.

"We just got a truck back," he says, "all the way from the cannery at Fullerton—three hundred miles of travel and it's back with an unacceptable load. It's got 12 percent mechanical damages, so something's beating on the tomatoes. And this is the machine that's been doing it."

Johnny Riley appears to think for a moment. "We had three loads like that today. Seven percent, 11 percent, and 17 percent mechanicals. You got to take the truck back, get some workers to take out the center of the load and put in some real good tomatoes before you send it back. It ties up workers, and it ties up a truck."

Buck and I join the crew for one lap of harvesting. Then, while the crew members smoke, Buck and a staff mechanic go at the machine with wrenches and screwdrivers. Finally, it is fixed. As we drive off in his truck, Buck talks about the nature of corporate farming. "We have budget sheets for every crop. It's what the management spends their time worrying about, instead of how to make the crops better. It's all high finance. It makes sense, if you think about what they have in it. But I'll tell you something. It's expensive to farm here."

Buck points across the darkness, to the lights of the assembly yard. "Just beyond those lights there's a guy owns a piece—a section of land, and he grows tomatoes there, too. A guy who works with the harvester here, he knows tomatoes pretty well. And he says that guy has a break-even of about 18 tons—18 tons of \$40 tomatoes pay his costs, and he's watching every row, growing better than 30 tons to the acre. Our break-even is 24 tons. Why? Because we're so much bigger. They give me more acres than I feel I can watch that closely. The partnership charges 35 bucks an acre management fee, good prices for this and that in the budget. And there is a stack of management people here, where that guy drives his own tractor while he thinks about what to do next. You can't beat him. This is not simple enough here.

"Here, they're so big, and yet they are always looking for a way to cut a dollar out of your budget. Trying to get more and more efficient. It's the workers who they see as the big expense here. They say, okay, management is us, but maybe we can cut out some of those people on the harvesting machines. We can rent these machines from the custom harvester company for \$6 a ton bare. We got to pay the workers by the hour even when we're holding up the picking. Twenty workers to a machine some nights and \$2.90 a worker is 58 bucks for an hour of down time. You keep moving or send people home.

"Of course this will all be a thing of the past soon. There's a new machine out—Blackwelder makes it—and it's not an experimental model. I mean, it's on the job, at \$104,000 and up a shot, and it still pays. It does the same work, only better, with only two workers on it. It's faster, and there's no labor bill. It's an electronic sort. It has a blue belt and little fingers and electric eyes, and when it spots a tomato that isn't right, the little fingers push it out of the way. You just set the amount of greens you want left alone, and it does that, too. We're going to have two of them running later in the harvest, soon as they finish another job."

"What about the workers who have always followed the tomato harvest?" I ask.

"They're in trouble," says Buck, shaking his head. "They'll still be needed, but only toward the end of the harvest. At the beginning, most of what these cullers take away is greens. The electric eye can do that. But at the end of the harvest, most of what they take away is spoiled reds, stuff that gets overripe before we pick it, and they say the machines don't do that as well. That leaves a lot of workers on welfare, or whatever they can get, hanging around waiting for the little bit we need them. They get upset about being sent away. This one guy trying to get his sister on a machine, he's been coming up to me all evening saying things about the other workers. I just ignore it, though. It's all part of the job, I guess."

The trouble in which California farm labor finds itself is old trouble. And yet, just a few years ago, when harvesting of cannery tomatoes was still done by hand, ten times the labor was required on the same acreage to handle a harvest that yielded only a third of what Tejon Agricultural Partners and other growers expect these days. The transformation of the tomato industry has happened in the course of about twenty years.

Much has been written recently about this phenomenon, and with good reason. The change has been dramatic, and is extreme. Tomatoes we remember from the past tasted rich, delicate, and juicy. Tomatoes hauled home in today's grocery bag taste bland, tough, and dry. The new taste is the taste of modern agriculture.

The ruination of the tomato was a complex procedure. It required cooperation from financial, engineering, marketing, scientific, and agricultural parties that used to go their separate ways more and cross paths with less intention. Now larger institutions control the money that consumers spend on tomatoes. It is no more possible to isolate a "cause" for this shift than it is possible to claim that it's the spark plugs that cause a car to run. However, we can at least peer at the intricate machinery that has taken away our tasty tomatoes and given us pale, scientific fruit.

Let us start then, somewhat arbitrarily, with processors of tomatoes, especially with the four canners—Del Monte, Heinz, Campbell, and Libby, McNeill & Libby—that sell 72 percent of the nation's tomato sauce. What has happened to the quality of tomatoes in general follows from developments in the cannery tomato trade.

The increasingly integrated processors have consolidated, shifted, and "reconceptualized" their plants. In the fast world of marketing processed tomatoes, the last thing executives want is to be caught with too many cans of pizza sauce, fancy grade, when the marketplace is starved for commercial catsup. What processors do nowadays is capture the tomatoes and process them until they are clean and dead, but still near enough to the head of the assembly line so they have not yet gone past the squeezer that issues tomato juice on the sluice gate leading to the spaghetti sauce vat, the paste vat, the aspic tank, or the cauldrons of anything in particular. The mashed stuff of tomato products is stored until demand is clear. Then it's processed the rest

of the way. The new manufacturing concept is known in the trade as aseptic barreling, and it leads to success by means of procrastination.

The growers supplying the raw materials for these tightly controlled processors have contracted in advance of planting season for the sale of their crops. It's the only way to get in. At the same time, perhaps stimulated by this new guaranteed marketplace—or perhaps stimulating it—these surviving growers of tomatoes have greatly expanded the size of their plantings. The interaction of large growers and large processors has thus crowded many smaller growers out of the marketplace, not because they can't grow tomatoes as cheaply as the big growers (they can) but because they can't provide large enough units of production to attract favorable contracts with any of the few canners in their area.

In turn, the increasing size of tomato growing operations has encouraged and been encouraged by a number of developments in technology. Harvesters (which may have been the "cause" precipitating the other changes in the system) have in large part replaced persons in the fields. But the new machines became practical only after the development of other technological components—especially new varieties of tomato bred for machine harvesting, and new chemicals that make machine harvesting economical.

What is remarkable about the tomato from the grower's point of view is its rapid increase in popularity. In 1920, each American ate 18.1 pounds of tomato. These days we eat each 50.5 pounds of tomato. Half a million acres of cropland grow tomatoes, yielding nearly 9 million tons, worth over \$900 million on the market. Today's California tomato acre yields 24 tons, while the same acre in 1960 yielded 17 tons and in 1940, 8 tons.

The increased consumption of tomatoes reflects changing eating habits in general. Most food we eat nowadays is prepared, at least in part, somewhere other than in the home kitchen, and most of the increased demand for tomatoes is for processed products—catsup, sauce, juice, canned tomatoes, and paste for "homemade" sauce. In the 1920s, tomatoes were grown and canned commercially from coast to coast. Small canneries persisted into the 1950s.

Tomatoes were then a labor-intensive crop, requiring planting, transplanting, staking, pruning. And, important in the tale of changing tomato technology, because tomatoes used to ripen a few at a time, each field required three or four forays by harvesting crews to recover successively ripening fruits. The forces that have changed the very nature of tomato-related genetics, farming practices, labor requirements, business configurations, and buying patterns started with the necessity, built so deeply into the structure of our economic system, for the constant perfection of capital utilization.

Some critics sometimes seem to imply that the new mechanization is a conspiracy fostered by fat cats up top to make their own lives softer. But though there are, surely, greedy conspirators mixed in with the regular folks running tomato farms and tomato factories and tomato research facilities, the

impulse for change at each stage of the tomato transformation—from the points of view of those effecting the change—is “the system.” The system always pressures participants to *meet the competition*.

Even in the 1920s, more tomatoes were grown commercially for processing than for fresh consumption, by a ratio of about two to one. Today the ratio has increased to about seven to one. Fifty years ago, California accounted for about an eighth of all tomatoes grown in America. Today, California grows about 85 percent of tomatoes. Yet as recently as fifteen years ago, California grew only about half the tomato crop. And fifteen years ago, the mechanical harvester first began to show up in the fields of the larger farms.

Before the harvester came, the average California planting was about 45 acres. Today, plantings exceed 350 acres. Tomato production in California used to be centered in family farms around Merced. It has now shifted to the corporate farms of Kern County, where Tejon Agricultural Partners operates. Of the state's 4,000 or so growers harvesting canning tomatoes in the late sixties, 85 percent have left the business since the mechanical harvester came around. Estimates of the number of part-time picking jobs lost go as high as 35,000.

The introduction of the harvester brought about other changes too. Processors thought that tomatoes ought to have more solid material, ought to be less acid, ought to be smaller. Engineers called for tomatoes that had tougher skins and were oblong so they wouldn't roll back down tilted conveyor belts. Larger growers, more able to substitute capital for labor, wanted more tonnage per acre, resistance to cracking from sudden growth spurts that follow irrigation, leaf shade for the fruit to prevent scalding by the hot sun, determinate plant varieties that grow only so high to keep those vines in rows, out of the flood irrigation ditches.

As geneticists selectively bred for these characteristics, they lost control of others. They bred for thick-walledness, less acidity, more uniform ripening, oblongness, leafiness, and high yield—and they could not also select for flavor. And while the geneticists worked on tomato characterists, chemists were perfecting an aid of their own. Called ethylene, it is in fact also manufactured by tomato plants themselves. All in good time, it promotes reddening. Sprayed on a field of tomatoes that has reached a certain stage of maturity (about 15 percent of the field's tomatoes must have started to “jell”), the substance causes the plants to start the enzyme activity that induces redness. About half of the time a tomato spends between blossom and ripeness is spent at full size, merely growing red. (Tomatoes in the various stages of this ripening are called, in the trade, immature greens, mature greens, breakers, turnings, pinks, light reds, and reds.) Ethylene cuts this reddening time by a week or more and clears the field for its next use. It recovers investment sooner. Still more important, it complements the genetic work, producing plants with a determined and common ripening time so machines can harvest in a single pass. It guarantees precision for the growers. The large-scale manufacturing system that buys the

partnership's tomatoes requires predictable results. On schedule, eight or ten or fourteen days after planes spray, the crop will be red and ready. The gas complements the work of the engineers, too, loosening the heretofore stubborn attachment of fruit and stem. It makes it easier for the new machines to shake the tomatoes free of the vines.

The result of this integrated system of tomato seed and tomato chemicals and tomato hardware and tomato know-how has been, of course, the reformation of tomato business.

According to a publication of the California Agrarian Action Project, a reform-oriented research group located at Davis (some of whose findings are reflected in this [chapter]), the effects of an emerging “low-grade oligopoly” in tomato processing are discoverable. Because of labor savings and increased efficiency of machine harvesting, the retail price of canned tomatoes should have dropped in the five years after the machines came into the field. Instead, it climbed 111 percent, and it did so in a period that saw the overall price of processed fruits and vegetables climb only 76 percent.

There are “social costs” to the reorganization of the tomato processing industry as well. The concentration of plants concentrates work opportunities formerly not only more plentiful but more dispersed in rural areas. It concentrates problems of herbicide, pesticide, and salinity pollution.

As the new age of cannery tomato production has overpowered earlier systems of production, a kind of flexibility in tomato growing, which once worked strongly to the consumer's advantage, has been lost. The new high-technology tomato system involves substantial investment “up front” for seed, herbicides and pesticides, machinery, water, labor, and for the “management” of growing, marketing, and financing the crop.

In order to reduce the enormous risks that might, in the old system, have fallen to single parties, today's tomato business calls for “jointing” of the tomatoes. Growers nowadays share the burden of planting, raising, harvesting, and marketing—“farming” together with a “joint contractor.” The tomatoes grown by Johnny Riley and Buck Klein on land held by Tejon Agricultural Partners were grown under a joint contract with Basic Vegetable Products, Inc., of Vacaville, California. TAP's president at the time, Jack Morgan, was previously executive vice president of Basic Vegetable.

“Jointing” deals are expensive both to set up and to administer. The tomato-growing business situation is becoming so Byzantine that the “per unit cost of production,” the cost to a grower of producing a pound of tomatoes, is no longer the sole determinant of who gets to grow America's tomatoes. Once, whoever could sell the most cheaply won the competitive race to market. Today, the cost of doing all business supersedes, for large-scale operations, simple notions such as growing tomatoes inexpensively. Market muscle, tax advantages, clout with financiers, control of supply, all affect the competitive position of TAP as much as does the expense of growing tomatoes.

The consequence of joint contracting for the consumer is a higher-priced

tomato. Risks that until recently were undertaken by growers and processors and distributors separately, because they were adversaries, are passed on to consumers now by participants that have allied. Growers are more certain they will recover the cost of production.

Howard Leach, who was president of TAP's parent company, Tejon Ranch, at the time of the tomato harvest, understood very well the economic implications for consumers of joint contracting.

"Productivity lessens." Leach explained to me. "Risk to the producer lessens, which is why we do it. The consumer gets more cost because the processor who puts money in will try to lower supply until it matches the anticipated demand. If you're Hunt-Wesson, you gear up to supply what you forecast that sales will be. You want an assured crop, so you contract for an agreed price. You're locked in, and so is the farming organization. But they are locked into a price they are assured of, and they are big enough to affect the supply."

Under this sort of business condition, the marketplace is fully occupied by giants. It is no place for the little guy with a truckload or two of tomatoes—even if his price is right. Farmers who once planted twenty or thirty acres of cannery tomatoes as a speculative complement to other farming endeavors are for the most part out of the picture, with no place to market their crops and no place to finance their operating expenses. As John Wood, a family farmer turned corporate manager, who currently runs TAP, puts it, "The key thing today is the ability to muscle into the marketplace. These days, it's a vicious fight to do so." And Ray Peterson, the economist and former vice president of Tejon Ranch, sums up the importance of the business side of farming now that the new technology has increased the risk and scale of each venture. "Today," he says, "vegetable farming is more marketing than farming."

The "jointing" of vegetable crops integrates the farming operation with the marketing, processing, and vending operations so closely that it takes teams of lawyers to describe just where one leaves off and another begins. And joint contracting is only one of several sorts of financial and managerial integration with suppliers and marketers that occur in the new tomato scene. Today chemical companies consult as technical experts with farming organizations. Equipment companies consult with farming organizations about what machines will do the jobs that need doing. Operations lease equipment from leasing companies run by banks that also lend them funds to operate. Financial organizations that lend growers vast sums of capital for both development and operations receive in return not merely interest but negotiated rights to oversee some decision-making processes. Agricultural academics sit on agribusiness corporate boards.

Today the cannery tomato farmer has all but ceased to exist as a discrete and identifiable being. The organizations and structures that do what farmers

once did operate as part and parcel of an economy functioning at a nearly incomprehensible level of integration. So much for the tasty tomato.