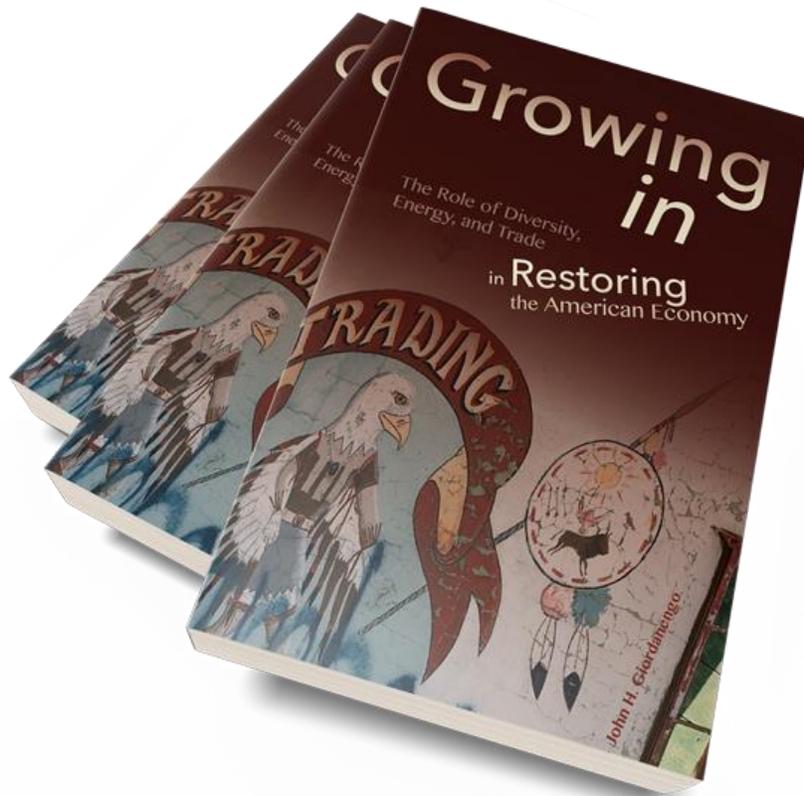


*The greatest US economy was not some golden era of the past.
It is that which lies ahead.*

The following pages are an excerpt from *Growing In: the role of diversity, energy, and trade in restoring the American Economy.*



For an advance copy of *Growing In*, please visit
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What Caused the Death of Oakdale?

A tale of one Nebraska community destroyed by energy and trade,
with the aid of the US government.

DRAFT: May 05, 2021

From the time pioneers settled Nebraska's Antelope valley in 1870s, a vast diversity of agricultural products sprang from its fertile soil: oats, wheat, corn, potatoes, pumpkins, and a great diversity of squash and root crops. "Potatoes were so plentiful as to be of little value," wrote A.J. Leach (Leach 1909). Should vegetables and grains be inadequate in a given season, the entirety of Antelope County was rich in oak and cottonwood timber, cattle, wild game, and more. From such abundance the community of Oakdale thrived. Hundreds of farm families surrounded the town, where a thriving businesses community sprang up to support them all. Barber shops, banks, mercantiles, grocery stores, doctors' offices, manufacturers, and a community band all contributed to Oakdale's pride. And it wasn't long before Oakdale earned its honor of county seat.

The gears of global market capitalism turning, America grabbed the reigns of global power from Great Britain. Oakdale went along for the ride, grabbing every opportunity for expansion. And from a peak in prosperity in the 1920s, Oakdale entered a steady economic slide. Today, any families left behind are tied to the success of one crop: corn. Where dozens of farm families once dotted the rolling hills and valleys, a single agricultural corporation now stands (Ray Ahrens 2020). Economic diversity has hit rock bottom. And the last time ecological diversity was so low great sheets of ice, not corn, blanketed the land.

Trees—not children—were growing up through the playground equipment when I visited Oakdale in 2011. While junkyards, rather than serving an economic function, were being reclaimed by forests. A decade later, no entry signs were posted on schools and churches (Figure 1). Entire neighborhoods were blighted. This socio-economic tragedy is due not to any lack of fortitude, intelligence, or dedication of great Nebraskans, but something sinister: state and federal economic policy. Oakdale's fate was further cemented by America's cumulative ignorance of the role diversity, energy, and trade play in the sound structure of an economy

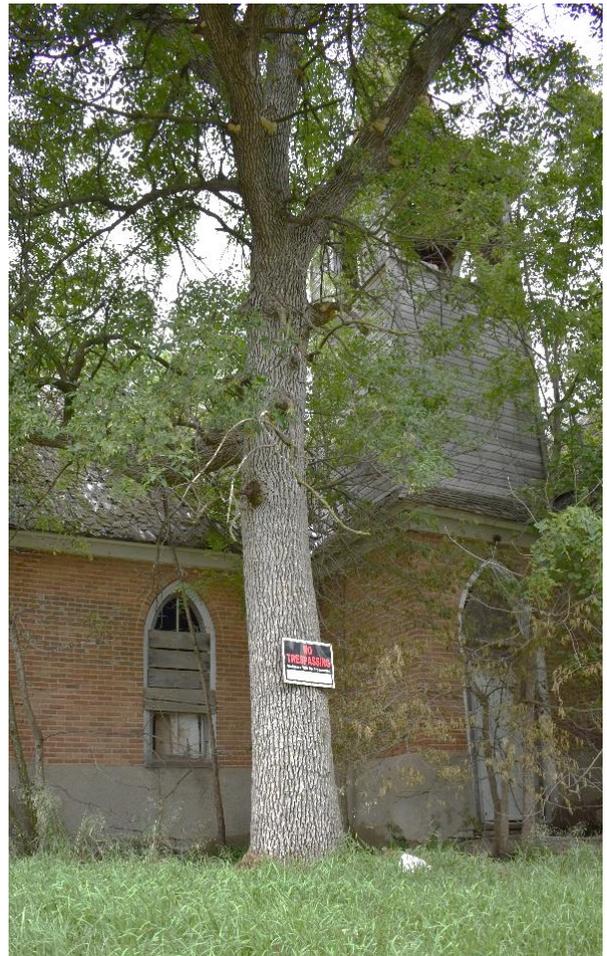


Figure 1. Oakdale Nebraska, June 2020. Top Left: High School. Bottom Left: Main Street. Top Right: local church.

I cannot help but feel deep sorrow for Oakdale, and those left struggling to survive. Nestled among oak covered hills, as if protecting this once-quintessential American town, a few creeks ripple through on their way to the Elkhorn river. Such a setting cannot be manufactured. And I feel sorrow, for Oakdale is one of those soulful and prideful towns that should be thriving, not dying in America. Why did she go?

When you ask around town or in neighboring Neligh—which “stole” the county seat from Oakdale—many will say it was the loss of the railroad that blew Oakdale its final kiss goodbye. Others believe it was the day the highway came through town, which more quickly shuttled youth out of Oakdale than it could deliver them new opportunities. But from personal observation, and from the evidence of self-regulating ecosystems, here is what I have come to believe.

As the scale of agriculture exploded between 1940-1970, with the jaws of the Green Revolution clamping down harder upon Oakdale. The cost of fossil fuel energy in the 1960s was a quarter the cost of fuel five decades later (EIA 2012). And from such cheap energy, cheap fertilizers and pesticides could be lavishly applied. Farm diversity plummeted further. By the time the vision of the Green Revolution was fully realized, seven million farms in America had vanished from the face of the US economy (USDA, 2017).

With the decline in farm diversity, business diversity plummeted. The youth packed their bags, full of hopes and dreams better realized in a more diverse economy. And who's to blame them. When the landscape engulfing you for hundreds of miles in every direction is dominated by corn-related business, your socio-economic prospects are duly limited. If I were but young in Oakdale, I too would have fled. For the community band has long since perished (Figure 2). There is no need for trombone players.



Figure 2. Community band of Oakdale, Nebraska. Photo by John Giordanengo, from an original provided under the authorization of the Antelope County Museum.

Oakdale's slow decline began even before WWII, the moment its collective drive became focused on an export-based economy. It was a vision sold to them by a growing capitalist elite whose interests lay not in strengthening but exploiting Oakdale. A better railway system. A larger mill. More consolidated and higher yielding farms. These were aspirations embraced by nearly every American farm town, its growth fueled by the ever-lengthening highway and interstate systems, the billowing farm subsidy program, and then the Green Revolution boom. Countless other factors spelled Oakdale's doom, such as cheap fossil fuels that made the Green Revolution and long-distance shipping possible.

Oakdale had grown up in the arms of a global market economy on steroids. Slowly, wealth became concentrated in the next largest businesses, then the next largest towns such as

Neligh. And then Norfolk. Finally, wealth was gathered up in the hands of Berkshire-Hathaway of Omaha, where investment moguls the likes of Warren Buffett are fed predominantly by the foreign and carry trades. Oakdale's prideful memories grew dimmer.

Other changes revealed themselves more insidiously. The moment train engines began running on diesel instead of coal, maintenance needs plummeted. Almost overnight the pre-WWI network of round houses—hubs for the maintenance of train engines—became obsolete. And the roundhouse Oakdale so desperately fought for in the early 1900s succumbed to the blissful evolution of the fossil fuel industry. If such devastating changes were insufficient to break the Oakdale economy, trade would deal a final blow.

Ghostly evidence of the impact global trade (commodity markets) has had is easily witnessed in an age-old human invention: the gristmill. Oakdale operated the first mill in Antelope county, adding value to the 100s of family farmers. That is, until Neligh developed a larger mill in a more advantageous location...the banks of the Elkhorn. And from booming demand, both mills thrived for a brief moment. That is, until destructive competition from the global economy demanded greater economies of scale. Mills needed to grow larger to survive. And those farmers that once relied on local mills began shipping their grain as far away as Minneapolis: home of General Mills.



Figure 3. The wave of grist mill collapses in the wake of an expanding global market economy.

The Oakdale mill was the first in the region to shut its doors. And by 1950, the Neligh mill forever stopped grinding seeds into flour. The value-added revenue for local farmers had completely vaporized, sending the diversity of Oakdale's economy another notch backward. And in 2019, even the largest mills had shut their doors (Figure 3). When the primary mechanism for economic success is raw growth, no scale of production is ever large enough.

Nebraska cattle producer and former state senator Al Davis summarized the farm decline in an interview with Time Magazine (Semuels, 2019): "Farm and ranch families are facing a great extinction." Representing the sentiments of hundreds of American farmers, Davis highlighted a stark reality facing the US, that "If we lose that rural lifestyle, we have really lost a big part of what made this country great." Specifically, the health and diversity of a nation's agricultural communities forms the foundation of its productive capacity. This is not a novel insight. Adam Smith made a similar observation nearly a century before Nebraskans began tilling the earth (Smith 1776), during the British Agricultural Revolution.

The impacts of a low diversity agricultural landscape struck repeatedly at the socio-economic heart of Britain and America. The most famous of these was the potato famine of the mid 1800s, afflicting those Europeans reliant upon a single crop for sustenance (Mann, 2011). In Ireland alone the famine caused the death of nearly one million men, women, and children (Baker 2017, Mokyr 2020). And while America has done well to develop diverse rust-resistant strains of corn throughout the country, corn monocultures still dominate 90 million acres (Economic Research Service 2020); an area the size of California. Failing to observe the deeper lessons from the potato famine, ten percent of America's homogenized corn harvest was destroyed in 1970 by the southern leaf blight.

But even greater blows have been dealt to homogenous agricultural landscapes. A global agricultural industry crash struck in the 1920s, followed by the dustbowl of the 1930s. And in the footsteps of high yield farming wrought by the Green Revolution, decline struck America's agricultural industry in the 1980s.

Oakdale could not survive in such a low diversity landscape. And with schools boarded up and warning signs posted outside of crumbling churches, many of those souls left behind have few options but drugs or suicide. This sad fate is not restricted to Oakdale. So extensive is the trend that overdose from illicit drugs in rural communities has surpassed that of urban centers (CDC 2017). To be clear, such a tragedy has not stemmed from an underperforming economy, but rather at the zenith of America's economic performance.

Beyond the losses in soil fertility and agricultural diversity, another threat has arisen. The bread basket of America is expected to suffer significant increases in heat stress, flooding, and drought in coming years (Pryor et. al. 2014). And to believe such uncertainty will not afflict America's low impoverished farmlands is nothing short of irrational exuberance.

Perhaps more importantly, corn, wheat, soy, and other commodity farmers are experiencing ever-rising production costs alongside ever-declining income (Dreibus, 2019). In turn, America's agricultural industry has been sucked into a vicious downward spiral of decreasing capacity, crumbling economic diversity, and a monumental lack of resilience. And when the next global market swing arrives, neighboring towns will follow in Oakdale's footsteps. Ray Ahrens of the Antelope County Historical Society readily foresees neighboring Neligh's future based on the trends of today. "The youth are leaving, and the drive to succeed is just not there like it used to be", Ray shared with me on a quiet summer day in 2020.

When the homogenized agribusiness bubble pops it will affect not simply a few cities. Akin to the auto industry, a multi-state region in the heart of America will suffer. But should the next revolution to strike America's heartland be of a different breed—one of increased domestic trade, farm diversification, and energy neutrality, few if any global market forces will shake the pride of the brightest and hardest working people I have ever met—Nebraskans.

And it will not be government bailouts, exogenous energy, and foreign trade that restore Oakdale, as such efforts have already inflicted more harm than good. Instead, it will be the entrepreneurs of the land and the factory that restore their communities, and in the process restore an economy in which all of America can take pride.

Regenerative Agriculture and its Allies

Gabe Brown, a straight-talking farmer from Bismark, North Dakota is one such entrepreneur. In Gabe's talk, "Regenerative Agriculture: Details of a Profitable Journey," he reveals some growing realities about "Regenerative Agriculture". Through a strategy of increasing plant diversity and eliminating tillage, Gabe has vastly reduced inputs and maximized profits (Brown 2020). Such a strategy, of course, is tied inextricably to the management of endogenous energy. The more diverse Gabe's farm is, the greater the surface area of leaves covering the ground, with which to capture more energy.

Gabe is not the first farmer to master such a strategy. For farming methods that diversify the landscape and build soils are ancient. Modern farmers simply use different terms, such as *sustainable farming* or *regenerative agriculture*. In the comprehensive article, "Agricultural sustainability: concepts, principles and evidence," Jules Pretty (2008) uses the term *sustainable farming* to describe those practices "that aim to make the best use of environmental goods and services while not damaging these assets." Such practices include biodynamic, community based, eco-agriculture, agroecological, farm fresh, free range, low input, permaculture, etc. Such diverse terminology reflects the context in which each system exists. For instance, Agroforestry is more likely to occur in the jungles of Costa Rica than in the prairies of Colorado.

The term regenerative agriculture is even more specific, and is more likely to be encountered in Colorado than Costa Rica. Regenerative agriculture refers to practices that increase plant diversity (i.e., photosynthetic capacity) in farm fields and build soil health. And fundamentally, soil health stems from an increase in soil organic matter. Organic matter, in turn, increases under no-till farming, cover cropping, crop rotations, compost and manure applications, rotational grazing systems, and other practices. Such practices help build biodiversity both above and below the soil surface, while creating soil conditions that can better receive and hold rainwater.

Ultimately, such practices restore the plant/soil microbiome to promote the development and cycling of essential soil nutrients, while sequestering carbon at greater depths beneath the soil surface. This leads to greater productivity, and hence more resources being transferred from the soil to higher levels in the food web. On Gabe's 5,000-acre farm, over 20 food products are generated, including six different animal products. In the end, such regenerative practices improve the resilience of a farm, and produce foods with greater nutrient density

And the best part, from a tax payer and economic sense, is that Gabe's farm does not require a single government subsidy. And with respect to other resource transfers, diverse regenerative farming systems demand far fewer inputs of exogenous energy, fertilizers, pesticides, and other inputs (Pretty 2008, Altieri *et al.* 2012, Capra and Luisi 2014). And such diversity pays dividends beyond the ecological landscape. There was a time when Gabe and his wife were over a million dollars in agricultural debt. And as Gabe puts it, "it was diversity that got us out of the hole."

Rebuilding Soils

The degrading impacts of modern agriculture on soil fertility are outlined well by the works of Pimentel (1995), Ontl (2004), Capra and Luisi (2016), and volumes of research conducted by the US Department of Agriculture (nrcs.usda.gov). And while communities around the globe grow more dependent upon the global market economy for food, the fertility of their soil continues to diminish under the pressures of fossil-fuel-intensive agriculture. Only, it is the soils of those developing countries that have suffered the greatest degradation (Pimentel 2006). Much of the fertile lands that might remain in those countries have been converted to monoculture crops for export markets.

Even in America, where farmlands experience some of the lowest rates of erosion in the world, 90% of farms are still losing soil faster than the natural rate of soil formation (USDA 2000, Pimentel 1995). In an attempt to compensate for such losses, a plethora of modern farming software, improved soil fertility and pest mapping, and improved soil moisture/weather predictions, etc. has certainly helped the modern farmer reduce inputs required of large-scale monocultures. Yet fundamentally, such technology cannot address the economic impacts of

reduced crop diversity or decreased soil organic matter. Rather, such technology can only attempt to compensate for such losses.

Soil organic matter does more than increase the capacity of soil to retain water and nutrients. Soil's that are rich in organic matter can better withstand the erosive forces of wind and water (Brady and Weil, 1996). As the public is becoming more aware of, the annual tilling required of high yield monocultures and other practices only exacerbate soil organic matter losses. Fundamentally, organic matter is broken down by microbial and fungal communities, which are stimulated by tillage, irrigation, and nitrogen additions. At the same time, modern agriculture demands substantial yields be attained absent continual inputs of organic matter. And solutions such as hauling in compost or manure from even thirty miles away (i.e., a nearby city) are far more expensive than applying chemical fertilizer, at least under the current economic model. And therein lies the challenge. The existing system cannot survive without destroying soil fertility.

We have created a downward spiraling food production system, with an associated feedback loop not only via social unrest, but via climate change. Briefly, here is how high yield farming systems affect this change. The amount of carbon stored in soils (2.5 trillion tons) vastly exceeds the 560 billion tons of carbon stored in all living plants and animals (Lal 2004, Brady and Weil 1996). That is, 80% of all terrestrial carbon is stored in the soil. Rampant losses of soil organic matter under modern agriculture, coupled with the burning of fossil fuels needed to support high yield farming, are large contributors of atmospheric carbon dioxide (CO₂). While carbon sinks—areas around the globe where carbon dioxide can naturally be stored (i.e., to reduce CO₂ concentrations in the atmosphere)—are degraded with every pass of the plow.

However, the same mechanisms that created this system can also operate in reverse. For instance, the research by LaCanne and Lundgren (2017) showed that the profitability of diverse regenerative agricultural systems is positively correlated with the organic content of soils, not with yield. And those regenerative systems build more carbon than they destroy. By extension, profitability has the potential to drive the building of soil organic matter in farmlands.

In the face of stark climate shifts acting upon Midwest farmlands, uncertain global food markets, decreasing nutritional content of high-yield foods, and continually dwindling fossil fuel reserves, conventional farming systems must become obsolete. This, of course, represents a tremendous opportunity for practices such as regenerative agriculture. And like other social and environmental movements, regenerative agriculture will succeed only to the extent the greater agricultural industry is restored. And to the extent it can nourish the hungry.

To read more about Agricultural Restoration, and its role in restoring the American economy, visit www.growingin.org.

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