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21rst Century Educational Farmstead

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"In schools, we create artificial learning environments for our children that they know to be contrived and undeserving of their full attention and engagement. Without the opportunity to learn through the hands, the world remains abstract and distant, and the passions for learning will not be engaged." - *Shop Class as Soulcraft* by Matthew B. Crawford

Preface: Setting the Educational Stage

My parents have lived on their three acre property south of Lincoln for thirty-some years. My father retired in 2003 from the Lincoln Police Department and has slowly returned the old barn buildings he moved there to their original purpose, while maintaining and expanding the vegetable garden. The "barn" is about 18' by 20' while the "poultry shed" is 16' by 14' and they are now home, depending on the time of year, to a couple dozen chickens, Muscovy ducks, and turkeys. All of these birds live what most would consider a pretty good life. On a good day, a dozen eggs a day can be collected from their coop.

The garden seems to be a living entity itself, slowly growing in different directions, asparagus on the south side, squash planted on the northwest flank, tomatoes in an extension on the east. In an average year, sweet corn, onions, potatoes, carrots, rhubarb, peppers, tomatoes, broccoli, lettuce, cabbage, and green beans are all grown. Since more produce ripens all at once than can be consumed, all sorts of blanching, freezing, and drying occur so it can be enjoyed during the cold winter, albeit at a slightly reduced quality.

As my dad has settled further into his retired lifestyle, he has continued to experiment in the hobby farm lifestyle. In addition to the poultry and vegetables, two honey bee colonies have been added. The apple trees my dad planted some twenty years back doesn't produce much anymore but are now highly trafficked during their bloom with workers collecting nectar and spreading pollen.

Not to say that my dad's day is not full of activity, he certainly isn't sitting around watching television, but his retired lifestyle allows a level of flexibility not many other people experience. This has allowed him, along with my mother although she is not yet retired, to babysit my older sister's boys whenever needed. Her oldest Avery is 7, Brandon is 3, and Myles was just born this past January. Avery never attended preschool but he was able to spend entire days at my parents' house, experiencing nature, gardening, poultry, and various forms of wildlife while my sister and her husband were at work.

Brandon has been receiving similar experiences now and I'm sure Myles will as well as he grows up. All three will reach kindergarten having been exposed to a world of living that many probably won't, even with preschool. Avery has helped plant the garden, watch the plants grow, pulled weeds, discovered the importance of waiting until vegetables are ripe, fed the chickens, collected their eggs, changed their water, and watched chicks hatch and grow into those chickens he feeds. He embodies the term self-accomplishment when he is doing these tasks. He is learning inexplicable amounts about life at the most basic level in a manner that is accomplishing something real. He enjoys telling people the specific steps my dad gave him in doing chores, "Make sure the water dish is rinsed out before it's refilled," "Two scoops of scratch per feeder." Without being able to put it in words, he intuitively knows that what he is doing has an impact on something real. Those chickens are dependent upon somebody feeding them in order to survive, and in those cases, that somebody is him.

Avery also has taken interest in the variety of vegetables grown in the garden. He'll ask, "Do you like broccoli?" "Yes." "Me too, Papa says that's good, that most kids my age don't like broccoli, but I do." Something special is happening when my dad and Avery can go out to the garden during the summer, pick fresh vegetables, then go to the barn and collect a few eggs, and take them inside. Then he can help my mother process the vegetables and cook them, depositing the inedible parts into the compost container. They can all then sit at the kitchen table, overlooking the backyard and talk about whatever might be on anybody's mind at that moment. Afterwards, Avery can carry the compostables out to the compost pile next to the garden where they are broken down by some microorganisms before being returned to the garden. He has no idea what is going on at cellular level now in any specific manner. However, I'm sure at some point when he is 16 and dozing off in high school biology, a teacher will introduce the nitrogen cycle and something might click.

Gently formalizing the experiences my nephews are receiving into a proper school could be an effort that could positively impact generations to come. The school would tread the line between a pure nature experience and institutional learning without becoming lost in the modern rhetoric of educational theory. The current social climate in the United States is moving towards heightened environmental awareness and educational reform, both of which could be addressed in a school built around the experiences my nephews are getting.

A 21st Century Educational Farmstead

When Europeans began settling in the United States, farmsteads were built across the Great Plains. Out of necessity, these had to function in a self-sufficient manner; meaning the people had to produce their own food, use local materials, and be energy efficient for their transportation. Parents had to teach their children how to do all of the practical work it took to maintain their lives. This was the foundation that America was built upon. Having completed the first decade of the 21st century, the time seems right for a mental re-settlement that follows some of those same principles. Teaching our children practical skills like growing their own food and using hand tools to give them a general sense of self-sufficiency is a must. A general awareness of one's natural surroundings no longer exists in an age where a teenager can adeptly use a computer but can't cook a meal from scratch, where a child can identify an Angry Bird but not a purple martin, an age where children play in an organized sport year-round but never build a tree house.

As a remedy, my proposal is an integrated farm/school/bicycle shop located near Lincoln, Nebraska. This '21st Century Educational Farmstead' will incorporate the mainstream educational goals (mathematics, English, science etc. all aimed toward academic preparation) with exposure to the natural environment. The foundation for teaching will be framed within bicycle shop- and farm-based activities. This framework will provide an education grounded in real-life activities that are relevant to the student. It's the difference between an elaborate math word problem involving two trains traveling through a tunnel, and determining the ideal irrigation rate for the vegetable garden in July—one has no real repercussions outside the classroom, while the other determines the success or failure of the students' hard work.

This 21st Century Educational Farmstead will be built around a small-scale (relative to modern farming) organic farm that is designed in a manner that a school can be easily integrated, and will include a bicycle shop. The bicycle portion will provide a format for teaching science, especially physics, as well as health education and hands-on mechanical skills plus arguably the most energy efficient way for a student to travel to school. Both the farm and bicycle shop will function as businesses, in that they will not require outside funding in order to operate.

Integration is a crucial part of this proposal. All of the aspects of this 21st Century Educational Farmstead already exist in some form somewhere in the United States. There is a major movement towards healthy, farm-fresh produce in school lunches, there are small-scale

organic vegetable farms across the country, there are a handful of bicycle shops in Lincoln, and plans for zero-net emission schools exist throughout the country. However they do not exist together. The prospect of integrating the base concepts of these innovations has great potential. With this in mind, I will explore several case studies that will serve as the blueprints of the proposal. Local examples will initially be used to display the community involvement prospect, then more geographically distant models that more closely represent the level of integration.

Two farms near Lincoln, Shadow Brook Farm, located at 2201 West Denton Road, and Robinette Farm, located at 17675 SW 14th between Sprague and Martell, will serve as models for the farm portion. Re-Cycled Bicycle shop in Lincoln at 2756 East South Street will be examined, along with the now defunct Walton Trail Company, to show the bicycle shop portion. The University of Nebraska-Lincoln's Cedar Point Biological Station will show the benefits and mechanics of nature-immersed learning. The ZNETH house in Omaha is an example of how engineering and architecture students could contribute to the design of sustainable buildings. Prairie Hill Learning Center, near Roca, is a center for Montessori education using a farm environment and mixed-age learning projects, and with an environmentally conscious focus. Prairie Hill is the closest existing model of education to the 21st Century Educational Farmstead school proposal in the Lincoln area.

Shadow Brook and Robinette Farms: Two Contemporary Models

Both Shadow Brook and Robinette Farms are largely vegetable farms supported by local buyers through the Lincoln farmers markets and a CSA (Community Supported Agriculture) subscription service. At Shadow Brook, they grow a variety of vegetables on 10 of their 34 total acres, raise grass-fed beef cows, and use a herd of dairy goats to make cheese. The system is based around local marketing, so they sell their produce at the farmer's markets in Lincoln and Omaha as well as run a subscription CSA (Community Supported Agriculture.) With a CSA, customers pay money up front to the farmer in exchange for a share of the harvest, oftentimes on a weekly basis. So a customer will pay anywhere from $150 to upwards of $500 to receive a portion of the vegetables and produce that is in season, from about April to early November. An important part of a subscription CSA is the "sharing of risk among farmers and consumers. In lean or disaster years, consumers may receive limited produce while the farmer still manages a livable wage; in good years, the consumers share the bounty" (Sharp 2002). CSA share pick-up

also facilitates a personal relationship between the farmer and the consumer, and a sense of personal investment in the community; this is a sharp contrast to the monoculture commodity-based business of large-scale farms, where the end consumer often has no idea where the product was grown, or even how agriculture works.

A recent *New York Times* article from March 5th entitled "In New Food Culture, a Young Generation of Farmers Emerges" focuses on the movement among 20 to 30 year olds that are choosing farming as their career. One paragraph from the article says the following: "Garry Stephenson, coordinator of the Small Farms Program at Oregon State University, said he had not seen so much interest among young people in decades. 'It's kind of exciting,' Mr. Stephenson said. 'They're young, they're energetic and idealist, and they're willing to make the sacrifices." While the article focuses on the Pacific Northwest and the progression there, Robinette was founded by Chloe Diegel and her husband Alex McKiernan and is in its second year near Lincoln. As a young couple starting a farm, they are evidence of the trend toward small, local food production in this area.

Re-Cycled Bicycles: A Future Business Model

Re-Cycled Bicycles was purchased by my brother Tyler in September of 2009. He has since been the sole employee at the shop, doing the sales and maintenance himself. This has allowed him to keep costs low and establish the business before he hires additional employees. He does sell new bikes, but Re-Cycled is different from other shops because of the focus on re-building old bikes. This allows formerly inoperative bikes from the 1960's to the 2000's to be returned to use, rolling down the streets of Lincoln.

The re-building of bikes requires a pretty good understanding of the varying designs of bikes from different eras and what parts work with what bikes. Many of the customers at Re-Cycled are searching for parts for the Schwinn Continental they rode back in the 1970s when the owner was 20 and attending college, and Re-Cycled is the only shop in town that has a stockpile of those parts thanks to its former owner. College students also make up a significant portion of his business. Most rebuilt bikes are significantly cheaper than new but still run better than a department store bike, making them appealing to a college student looking to cut down on gas money.

The Walton Trail Company: A Lesson from the Past

The Walton Trail Company was a frequent stop for my family during its years of operation. It was the bike shop that my family visited on the fateful day in 1996 that we decided as a family to become cyclists, all six of us. The shop existed in an old converted bank just off the MoPac Trail in the town of Walton. The building itself had a lot of character because of its hybrid nature as a former bank turned bike shop. I'm sure most people can think of similar businesses, run out of old buildings where certain things aren't really functional but definitely endearing. In addition to the building's character, the employees and regulars further strengthened its memorable identity.

In addition to the standard bicycle shop services like bike and accessory sales and maintenance, the Walton Trail Company also served quality sandwiches made from homemade bread. The location near the MoPac trail made it the perfect place for people to visit the shop and have lunch, especially families. For those unfamiliar, the MoPac is a nearly 22 mile long trail of crushed limestone that runs mostly east out of Lincoln starting at 84th Street just south of O Street. The Trail Company's location just 2.5 miles from Lincoln promoted a lot of use by families, and got people from the city into a rural community and an experience many wouldn't have had otherwise. The opportunity to ride a bicycle with my family to Walton and have lunch in a small town community atmosphere was about as good as it got, and we took full advantage.

Unfortunately, the Walton Trail Company is no longer open. The old building required quite a bit of upkeep and the owners were overextended with other jobs. The City of Lincoln purchased the building so it could be burned down for fire-fighter training. The shop may no longer exist, but its legacy is still strong. I recently talked with one of the former co-owners Richard Conradt about the shop. I can remember the advice he gave me back when I was ten and about to be the proud owner of new bicycle. "Now there are bikes you can ride through and over walls and bikes you ride around the wall. This bike is one you ride around the wall," informing me that this was a piece of machinery that I needed to care for, not something to be riding with reckless abandon. Richard now solely teaches at Lincoln High and coaches the swim team, but still bikes and still runs into folks from the Walton days. All have positive memories of the shop and wish it was still in existence. When we talked, he discussed the Bright Lights bike rides he ran out of the Trail Company. These rides consisted of a lesson on changing a flat tire along with other basic bicycle maintenance and a ride from Walton to Elmwood and back (a 30+ mile ride round-trip.) This meant he had kids around 12 years of age riding a significant distance in the

heat of summer. Although it didn't always play out the smoothest, the experience probably left a lasting impression on these kids. I remember the first time I rode 100 miles in a day a couple years ago and how satisfying that was—30 miles at that age is an equally impressive feat.

These two bike shops are the models for the shop that would exist on the 21st Century Educational Farmstead; ours would be a combination of the best parts of each shop—the business model of Re-Cycled with the atmosphere and location of the Walton Trail Company. *Bicycling Science* by Frank Rowland Whitt and David Gordon Wilson is a thorough exploration of the history, physics, and engineering behind the bicycle and could be easily utilized in making the bicycle shop a classroom (Whitt and Gordon 1982). The Netherlands has also explored thematic teaching in their schools during the 1990's with a project entitled *Bridges, Bicycles, and Traffic - Thematic Physical Science Lessons*. bicycles, efficiency and traffic. Dr. L Kersten at the University of Nebraska Lincoln translated some of the experimental instruction materials from the University of Amsterdam into English and these could serve as a template for teaching at the 21st Century Educational Farmstead Bicycle Shop.

Cedar Point: Nature-Immersed Learning

Cedar Point is the University of Nebraska's biological research station located at a former Girl Scout camp north of Ogallala, Nebraska, near Lake McConaughy. It exists as a location for fully immersed classes and research pertaining to biology. In addition to research opportunities, each summer they offer "8 experience based field courses that focus on student research projects." Providing an environment where fauna and flora are in abundance and biologists with different backgrounds are present, allows plenty of cross-speciality collaboration to take place.

As I am now in my final undergraduate semester at UNL, I can confidently say that the one three-week class I took at Cedar Point was a highlight of my educational experience. In just three weeks, I was exposed to the material in a constant and immersive manner, and I learned more than I would have in a standard class. I also formed multiple meaningful relationships with fellow students, some that last to this day. This type of learning environment is sorely lacking from many forms of education but could be implemented into a school when kept in mind from the beginning.

ZNETH House: An Energy Efficient Model

The ZNETH (Zero Net Energy Test House) project is a collaborative effort between the University of Nebraska's College of Architecture, College of Engineering, the Peter Kiewit Institute, the U.S. Green Building Flatwater Chapter, and the Green Omaha Coalition. The house is designed to create all of its own energy through solar panels, wind turbines, and geothermal power. It was constructed using Leadership in Energy and Environmental Design (LEED) standards, a green-building certification system designed to improve efficiency in water, energy and other resources. This house allowed students at UNL and UNO in different departments to work together to create a lasting creation that undoubtedly influences all who pass by.

The 21st Century Educational Farmstead would utilize similar technologies in an obvious manner so they could be used as a "third teacher" at the school. Since the school will clearly have a sustainability theme, having the buildings as energy efficient as possible only makes sense. The design of the buildings should allow for children of all ages to see the technology in some manner so it can serve as a constant reminder of its presence. The Prairie Crossing Charter School that I will discuss later incorporated LEED standards but unfortunately the kids are unaware of its presence. The school buildings there utilize geothermal power but there is no sign of its existence for the students as it is hidden below ground.

Prairie Hill: Learning in the Future

As stated above, Prairie Hill is the closest local model of what the 21st Century Educational Farmstead would look like. In fact, when I first visited Prairie Hill during a parent tour it was an almost surreal experience; so many of the ideas I had about what a school could be like were already taking place there. It may have been my lack of exposure to Montessori methods of teaching, but I have never seen a learning environment like that one. On their brochure they state, "At PRAIRIE HILL, learning goes beyond the classroom. PRAIRIE HILL's natural setting allows a two-year-old to collect eggs, an eight-year-old to collect biology specimens, children to hike across a field, visit the pond, groom horses, or feed the sheep. The study of life-cycles, food chains, and nutrition become everyday events as the children are involved in gardening, menu planning and food preparation. It is a unique place where anyone of any age can observe nature's beauty and order throughout the year." Based upon my visit, those words are a reality at Prairie Hill, not simply brochure propaganda. The similarities between

what the children are experiencing at Prairie Hill and what my nephews are experiencing at my parents are striking.

When I first arrived at Prairie Hill around 9 in the morning, the first thing I noticed was a handful of students sweeping the sidewalks, probably second or third graders. This was a few days after the snow had melted and the ground was saturated with snowmelt—the type of conditions that prevent many parents from letting their kids outside for fear of the muddy mess they will have to clean up later. These kids were happily sweeping up the gravel-salt mixture that had been put down across the sidewalk in rubber boots, and getting a little dirty. I was told that many prospective parents visiting the school are concerned with the concept of the kids "doing work," as it may sound like they working at the expense of playtime. However, from my perspective, it appeared these kids were having a meaningful conversation while doing some practical work, quite similar to how Avery converses with my father in the garden. The only difference being that these conversations are being carried on solely by the children.

After a brief run-down on the history and theory of Montessori teaching and Prairie Hill, the guided tour portion took place. The first building we visited was for the 18 month to 3 year olds. The inside was essentially a scaled-down version of a rustic farmhouse; miniature bathroom, kitchen table, plates, glasses, and silverware. In this way the children were able to familiarize themselves with how practical life works in a manner that makes sense to them. If they can learn to set a table correctly sized for them then they will be able to do so as they grow up. In addition to learning the practical skill of setting a table, the students learn math skills. They are guided to count the number of fellow students and set the table accordingly; if there are seven children then seven sets of silverware, plates, and glasses must be laid out.

Something I initially found surprising was that these three year olds were given real glasses, ones that break when dropped on the wood floor. Many, myself included, will immediately think of the safety issues this presents, given that broken glass is dangerous. But the kids are given breakable items so that they learn to be careful and respect their things. If they were given nothing but plastic, they wouldn't have to be attentive; careless blunders would have no negative repercussions. Instead, if one of the children doesn't slowly carry their glass to the table and accidentally drops it, they will have an instant consequence. I was assured that it almost always takes a single mishap for the children to learn. After that, they slowly carry their glass to the table.

It may seem as if I am dwelling on a small point with the glasses, but I think it is worth emphasizing. I hear many older people criticizing my generation of having an undeserved sense of entitlement, that we not only don't appreciate what we have, but feel we shouldn't have to "do without." I think there is plenty of credence in this assessment. Technology has been usurping itself faster than we as a society can adjust and create social norms to govern it. Television commercials are constantly bombarding children with a sense of want that is misconstrued as need. This has resulted in a throw-away society where people are more likely to pay $88 for bicycle at Wal-Mart that will maybe last one summer than to pay three to four times that to buy a quality one from a specialty shop that will last a decade if not longer. We don't respect the work that generations before us had to put in before they got to their current positions. It may seem a stretch to compare caring for a single glass to my generation's false sense of entitlement, but I think these children at Prairie Hill will grow up with a greater appreciation of quality, everyday items. After all, if a child learns to respect a glass, he or she will learn to care for bigger, seemingly more important things later in life like a vehicle or home.

Next we made our way to the "house" that was occupied by the first, second and third graders. Immediately inside the door several girls were polishing copper trinkets. It was in this room that I saw children preparing lunch in action. It may be helpful to mention the flow of the rooms at this point. There aren't many distinct rooms at Prairie Hill, most "rooms" spill into the next without any doors. So these children preparing lunch, a baked-apple dish, are in the same space as the children polishing copper and some others practicing letter pronunciations. I think this encourages the subjects to be integrated in their minds, rather than a typical public school where all the subjects are taught in isolated rooms.

As stated in their brochure, Prairie Hill is a place where nutrition becomes an everyday event "as the children are involved in gardening, menu planning and food preparation." I was impressed by the level of autonomy students have over their own food preparation and consumption. Each week two students choose the components of the menu, and that privilege rotates. They must choose one grain, protein, and a vegetable. Then, before lunch-time, the two students in charge of the menu for the week work with the 'cook' to prepare the meal. Cow's milk, rice milk, and water are available at every meal. In essence, the children are given a framework within which they can build a meal suited to their wants and needs.

This rule applies to more than lunch at the school—while students can exercise their independence, they must meet certain goals. Each day, the students must complete all of their lessons or tasks, but they have a fair amount of schedule flexibility. They keep individual journals of what they have done, and the journal is checked by a teacher, or guide, to help the student fulfill all their goals for the day. Children here are *macro*-managed, and it fosters a sense of individual responsibility.

Why a Learning Farmstead?

As I stated before all the components of the 21st Century Educational Farmstead already exist in one form or another in the United States. But none exist in a coordinated effort. I think integration is necessary to address societal problems relevant to the community and to the nation. The shortcomings of local food production, energy independence, *and* primary education are often addressed individually—they are interrelated, and a proposal of wider scope, including all three, could prove more effective and lasting. I recently read an article in *The New Yorker* entitled "The Poverty Clinic," that addressed the long-term health repercussions of a stressful childhood. Paul P. Shonkoff, a professor of pediatrics at Harvard Medical School commented in the article that, "It's not like we need a strategy for learning and a strategy for health and a strategy for character. The beauty of science is that it's showing us how all these things have common roots" (Tough 2011). Acknowledging those "common roots" and building a school and community with that in mind is the only way to create a lasting impact. A Learning Farmstead would give students a thorough understanding of where food comes from, provide them with a basic understanding of energy and how it powers our world, and give them an applied place to learn the standard subjects of primary and secondary education.

Farmer Age and the Future of Food Production

The 2007 Agricultural Census puts into statistics what most people familiar with farming first-hand already know. The average age of farmers in the country is increasing rapidly. The number of primary farm operators aged 65 and over increased from 674,968 in 2002 to 823,435 in 2007, an increase of 22%. On the flip-side the number of primary farm operators under 45 decreased from 851,091 in 2002 to 732,32 in 2007, a decrease of 14%. This is coinciding with

an increase in the number of the largest farms. Farms of 2,000+ acres have increased in number from 74,612 in 1997, to 77,970 in 2002, to 80,393 in 2007 (Census of Agriculture 2007). So while the average age of farmers is increasing rapidly, the largest farms are increasing in number as well. The combination of these two spells disaster for rural America. One needs to only travel to small towns across Nebraska to see that they are slowly dying. In the not too distant future, we are going to need more farmers to occupy more farms, these will serve to repopulate small towns and create a viable rural economy that equitably distributes wealth. There is a national trend toward new young farmers starting small farms (small farms of 10 - 49 acres have increased in number from 420,833 in 1997, to 563,772 in 2002, to 620,283 in 2007. These numbers may be a combined result of an increase in small farms like Robinette and Shadow Brook and an increase in wineries). This shift towards small farms could help create a generation of new young farmers, but this movement is not as visible in Nebraska as other places.

This past February I was given an assignment to interview somebody involved in the food production world for one of my classes. I decided to interview Carl Williamson who farms in Boyd County, Nebraska. Carl graduated from Butte High School with my father in 1972. While my dad moved to Lincoln following their graduation, Carl stayed in Butte to farm. He is still there today, although Butte is a much different place. Gone are the mainstays of the town; the only remaining businesses are Bill's Grocery Store, The Corner Bar, the bank and the post office and the Short Stop Convenience Store. There simply aren't people willing to do the hard work necessary to farm, and the economic incentive certainly isn't there.

Carl falls into the biggest age group of farmers, aged 45 to 65, which makes up over half of the total farmers in the Ag Census. But if the trend continues, nobody will be able to step up and grow our food. Carl spoke of this importance. Not only are the manual and mental skills necessary to farm being lost, but the rural culture is being lost. The author of "In New Food Culture, a Young Generation of Farmers Emerges" refers to this lack of farming know-how by stating, "There is a knowledge gap that has been referred to as 'the lost generation' — people their parents' age may farm but do not know how to grow food. The grandparent generation is no longer around to teach them." This an unsettling prospect for a future many surmise to be increasingly unpredictable as the impacts of peak oil and climate change become more prevalent.

A school that can provide the mental framework for young people to farm is going to be essential for our country to remain prosperous into an uncertain future. Given Nebraska's crop

production capabilities, it seems a perfect place for such a school. I see the school as functioning as a bridge between people of different ideological backgrounds. An appreciation of hard manual labor aimed at growing food is something that I think Carl, Chloe, and Alex have in common, despite their very different histories.

If the 21st Century Educational Farmstead is created, it would exist somewhere in the urban fringe of Lincoln and would be built around the type of farming going on at Shadow Brook and Robinette. A learning environment similar to that of Prairie Hill could be focused upon the functional farming tasks of a Shadow Brook. In addition, since the land would probably be surrounded by conventionally farmed land, a potential for multiple perspectives on farming could be provided. If a partnership were to be worked out with the farming neighbor, students could see the different approaches to food production in the United States, Shadow Brook vs. Carl's farming. Exposure to both these practices of farming would undoubtedly influence some of the students. Some may be more drawn to the small-scale vegetable farming and animal husbandry taking place at the 21st Century Educational Farmstead while others may be attracted to specializing in a few crops on a large-scale farm. Those intrigued by the farming lessons could slowly begin learning how to farm, bridging that "lost generation" as they would be attending the school on a year-round basis and could visit with the conventional farmer during that time. If Carl lived closer to Lincoln, I know he would be willing to teach, but since since he is not, hopefully a local farmer would be willing to do so.

Given many children's fascination with tractors, I'm sure a passion for farming could develop. My nephew Brandon, as most boys his age, is enamored with trucks — tow trucks, monster trucks, semi-trucks, red trucks, white trucks, (I've watched him spend half his visit to the Lincoln Children's Museum in the semi-truck display, he has to share it with the passing interest of the other children) — and like many boys, that interest may diminish but if it were fostered from a young age it could grow into something bigger. This is one of the many things the 21st Century Educational Farmstead is about: providing a learning environment where kids can hands-on explore different aspects of life and nature to find what they are passionate about, and creating the type of critical-thinking citizen necessary to settle humanity into the 21st century.

Learning with Passion

The book *Play* by Stuart Brown delves into the importance of play in finding one's passions. In the first chapter of the book he talks about a presentation by Ken Robinson in which Robinson tells the story of a now famous dance choreographer's rough time in a standard primary school because she could not sit still. Her parents ended up taking her to a specialist who discovered she needed to dance and move around in order to learn. She couldn't sit still and listen to a teacher lecture at the front of class all day, so her parents took the specialist's advice and took her to a dance school with other kids just like her. She thrived in this setting and has now done the choreography for broadway shows Cats and Phantom of the Opera. (A video of Robinson's presentation can be found at www.ted.com). Brown focuses in is book on how important it is for people to find something they are passionate about in order for learning to be long-lasting. The act of playing is an important part of finding these passions. Brown goes through several examples in his book to show that play, something that *seems* to be completely pointless, encourages innovation and happiness and is prevalent in all types of animals (one particularly good example pertains to an encounter between husky sled dogs and a polar bear).

Other books that touch subjects relating to how society may be stifling creativity and happiness in children are *Last Child in the Woods* by Richard Louv, which focuses on the importance of getting children outside and away from video screens, *Shop Class as Soulcraft* by Matthew Crawford, which elaborates on the author's dissatisfaction with his well-paying yet unfulfilling office job (he eventually quits to pursue his passion for working on classic motorcycles), and *The Element* by Ken Robinson which specifically focuses on individuals achieving at their highest levels when they are passionate and inspired about their work.

On School Lunch

A few weeks ago while my sister was unpacking Avery's lunch box she found the sandwich she sent with him that morning barely touched. He had only taken a couple bites out of

it. When she confronted him with this he said he didn't have time at lunch to eat anything. As soon as they got started eating that day, they were told they had to start cleaning up. My sister was initially skeptical, Avery probably was up to something at lunch, showing his buddies the temporary tattoo he got at the grocery store the day before, and forgot to actually eat his lunch. She found out a few weeks later that wasn't the case.

As with many ideas, they start with somebody's good intentions but don't transfer to real life quite as well. At Avery's school, they have recess immediately before lunch—the idea being to get the kids moving and exercising so they will eat their lunch. However, the schedule doesn't actually allow for transfer time from the playground to the lunchroom. Rounding up a few dozen 1st graders and getting their coats and gloves put away, gathering their lunches out of the cubby holes and rustling them to the lunchroom takes time. When my sister visited Avery for lunch, she discovered the limits of this system firsthand.

She and Avery had time to get seated in the lunchroom and then unpack their food — and that was about it. The person in charge was already giving them the five minute warning before they had finished half of their meals. Some of Avery's fellow students were just getting seated with their hot lunches. Even in a country like the United States, where lunch is treated more as a hassle to be taken care of as quickly as possible than something to be enjoyed, less than 15 minutes is rushed. Granted, when dealing with 1st graders there will be days when things don't go smoothly and time will be short, but if this is what happens on a regular basis, then it is less than desirable.

Avery generally eats cold lunch. Obviously the school can do nothing beyond educating parents and students about what is healthy. They can't force parents to take Oreos out of student's lunches, and shouldn't. However, the hot lunches prepared at the school are to a certain extent under the control of the school. Lincoln Public School District has around 36,000 students Kindergarten through 12th grade. 25,000 eat hot lunch on a given day. When the non-reduced elementary lunch costs an even $2.00 how much can a person really expect? The actual cost of the meal without labor is closer to $1.10. While some of the entrees sound good by their title — BBQ Sandwich on a whole grain bun, anybody who has eaten school lunch in the last couple decades probably knows the actual product leaves something to be desired. However, when one considers what it must take to create a safe (in terms of food poisoning) meal for around a dollar for 25,000 students on a daily basis, there probably is no better option.

Essentially it comes down to a matter of scale. One cannot realistically expect the food system at a large school district to function any differently. The kitchens are not outfitted to prepare fresh food (that equipment was disposed of a couple decades ago), the budget not only doesn't allow for fresh raw ingredients to be purchases but also doesn't allow the labor costs to prepare fresh food. It takes a significant amount of time to clean the soil off of a head of lettuce, cut it up, and get it ready for consumption. When a school district can buy lettuce from a corporate farm in California that will have it cleaned and processed before it gets here for less than a fresh head of lettuce costs, of course it is going to. First Lady Michelle Obama has brought these issues to the forefront of people's minds by planting an organic garden in the White House lawn and advocating for local, healthy food in children's lunches (Burros 2009.) This push is much deserved as childhood obesity and diabetes are not only detrimental to the child but can persist into worse adult-problems (Patton et al 2011). According to the 2007-2008 National Health and Nutrition Examination Survey, 16.9% of children and adolescents aged 2-19 are obese (further statistics on childhood obesity can be found in Table 1 below). This is resulting in a further over-burdened health-care system in the U.S (Wang and Dietz 2002.) Given that 5.5 billion lunches are served through the U.S. School Lunch Program, healthy school lunches could potentially control this alarming trend (United States Department of Agriculture Food and Nutrition Service.),

When a school is working with fewer students, alternatives begin to present themselves. At Central City High School in Nebraska, the food director Joyce Rice has found such an alternative. She became dissatisfied with the food that was being served at her school and decided to be proactive and change it. She began purchasing fruits and vegetables from Helgoth Melons, Pumpkins and Produce, which is located in the town of St. Libory, 30 miles from Central City, and used that produce to feed the 500 students she is responsible for. This allows

Table 1. Prevalence of obesity among U.S. children and adolescents aged 2-19, for selected years 1963-1965 through 2007-2008

the school to provide fresh and local food for the students while also supporting a local business.

According to an article written by Marie Powell at the Center for Rural Affairs (Powell 2010) about this arrangement, "Providing food to the four schools in the area doesn't bring in a

great deal of additional income, but Shelly Helgoth feels the pride and satisfaction." On the other side, according to Joyce, "It's a lot of hard work for the kitchen people," but she has convinced

Age (in years)[1]	NHANES 1963-1965 1966-1970[2]	NHANES 1971-1974	NHANES 1976-1980	NHANES 1988-1994	NHANES 1999-2000	NHANES 2001-2002	NHANES 2003-2004	NHANES 2005-2006	NHANES 2007-2008
Total	(3)	5.0	5.5	10.0	13.9	15.4	17.1	15.5	16.9
2-5	(3)	5.0	5.0	7.2	10.3	10.6	13.9	11.0	10.4
6-11	4.2	4.0	6.5	11.3	15.1	16.3	18.8	15.1	19.6
12-19	4.6	6.1	5.0	10.5	14.8	16.7	17.4	17.8	18.1

[1] Excludes pregnant women starting with 1971-1974. Pregnancy status not available for 1963-1965 and 1966-1970.

[2] Data for 1963-1965 are for children aged 6-11; data for 1966-1970 are for adolescents aged 12-17, not 12-19 years.

[3] Children aged 2-5 were not included in the surveys undertaken in the 1960s.

NOTE: Obesity defined as body mass index (BMI) greater than or equal to sex- and age-specific 95th percentile from the 2000 CDC Growth Charts.

them the extra labor is worth the benefits. Both sides appear to appreciate the added sense of community and interdependence despite the lack of any lucrative economic reward.

Prairie Hill school near Lincoln is attempting a similar effort, to improve the quality of food students are eating, but doing so from a different angle. A small garden on the school grounds is used to both teach the students how to garden while providing supplements to their lunches. They are also looking to contract with local farms to provide produce. The children participating in the menu choices and food preparation makes them more likely to eat the food that is also healthier for them. During my visit I was told the children will actively search out their peers that were in charge of the menus for that week to tell them that they did a good job, fostering a sense of community similar to that between Helgoth's and Central City. The director of Prairie Hill, Jeanne Hevener informed me that in the month of January she spent approximately a $1.35 per student per day on food, this includes lunch and an afternoon snack.

The 21st Century Educational Farmstead takes the work with lunches at Central City and Prairie Hill one step further. Instead of a local farm growing the fruit and vegetables, the farm on site will produce the food. The actual process of growing/raising the food will be done by the students and on a scale that a large portion of their food can be grown on site. Ideally all the food the students eat would be grown on site, but realistically it will provide a large portion of their diet. In the book "Gaviotas" by Alan Weisman, two workers on the site disagree about

construction materials. One informs the other that it "It's very romantic to build out of local natural materials, but it's dumb to be purists all the time. And impractical. The future will need nature and technology. We can't make solar panels out of whole-wheat bread" (Weisman 1998.) At the 21st Century Educational Farmstead this will be a governing concept. We will be progressive yet practical. Hopefully those things that cannot be produced on site can be acquired from local business, further developing a sense of community. The Center for Rural Affairs recently held a workshop in Hartington, Nebraska about the Farm to School Programs in Nebraska and South Dakota. The meeting was attended by school food service workers, local farmers, distributor representatives, and people active in community development, with the intent of developing networks for getting healthy, locally produced food into area schools. The 21st Century Educational Farmstead could easily integrate into this system and potentially become a hub for farm to school efforts in Nebraska, particularly Lincoln and Omaha.

The learning activities at the school will take place in the fields, lessons on biology, math, poetry, art, entrepreneurship all can be coupled with growing the food. Then the food can be prepared by the students, which not only makes the students more likely to eat the vegetables (I can attest to this with Avery and Brandon, and the folks at Prairie Hill agree), but they will also learn the skills necessary to prepare food from scratch (a skill unfortunately lacking in many people my age, including myself—we are more accustomed to the nuances of microwave button layouts than to preparing a squash to be cooked). All of these activities can be combined to create a healthy lunch for a reasonable cost.

The website "Cooking with Kids" was founded by Lynn Walters and is staffed by culinary professionals that develop kid friendly recipes and classroom activities utilizing fresh ingredients. One of the free lesson samples from the website is built around a root tasting lesson. They have versions aimed at different age groups. A free example of the lesson can be found in the appendix.The ability to build upon the complexity of the activity in terms of mental ability is perfect for a school setting —very similar to how my nephews are learning about composting in my parents' backyard and could eventually learn what is happening at a microbiological level. In the kitchen, students can learn basic terms for taste testing and build upon those.

Once they learn what tastes correspond to terms like tart or tangy, they can learn how to alter recipes to suit their personal tastes. The use of fractions could also be easily integrated into lessons about cooking. Sure it is easy to cook for one person, but scale that up to a family of six,

and the ingredients required increase six-fold. Experimentation is something that is lacking from our educational system as well, and the kitchen is a perfect place for it.

Dr. John Janovy is a biology professor here at UNL and was part of the original group that got Cedar Point started. He wrote a book several years back entitled "Teaching in Eden" where he writes about his experiences teaching at Cedar Point. He mentions the oatmeal bars that the original cook baked at the lodge during the 1970's. The recipe has been altered by successive cooks but the essence remains. He equates the cooking of the oatmeal bars to conducting lab experiments. When he started teaching an honors seminar about research methods he asks "how could one get some of the maturity that comes from actually doing research without having to spend the money, find the laboratory, buy and account for every drop of hazardous and radioactive chemical, and ensure the mice are treated well?" (Janovy 2003) He found the answer in the kitchen and has ever since had students cook lasagna from scratch for their first assignment, the point being that no matter how many times one repeats the ritual, the results will never be the same. Although it may not seem apparent at the time, getting children into the kitchen and following recipes might be the best way to teach them about scientific experiments while establishing practical life skills.

(A thorough guide to school lunch can be found at **http://www.ecoliteracy.org/sites/default/files/uploads/rethinking_school_lunch_guide.pdf**)

Seasonal Appreciation of Nature and Local Food

In "The Omnivore's Dilemma" Michael Pollan explores the food culture of the United States. One of the repeated themes in the book was for him to experience each step in food's journey from the field to the kitchen table, as well as many other immediate social and environmental impacts. By the end of the book he provides what he would consider to be the closest thing to the 'perfect meal.' He participated in almost every aspect of growing/procuring the food, from hunting morel mushrooms to hunting a pig. There were a few things he was not able to procure himself, but he kept those to a minimum. The basic concept is that he had an idea where the food came from, appreciated the work it required to get that food, and then did the preparation himself. This is very similar to what I would like to see take place at the farmstead,

but I would like to introduce one further step, an appreciation of how that food fuels our physical activity. The person in charge of scheduling recess before lunch at Avery's school understands this (although it is not implemented in the best fashion) and acts upon it, but I'm not sure the students completely understand.

This past October I was living in a house south of Lincoln, near Princeton. For a myriad of reasons (expense of gas, exercise, pure enjoyment) I decided to attempt to ride 1,000 miles in that month by commuting to class each day. The house was a quarter mile from the Homestead Trail, which is a reclaimed railroad converted into a limestone recreation trail. From the house to UNL's City Campus was an 18 mile ride, and it was another couple miles from City Campus to East campus. So on the days that I rode, I averaged around 40 miles. In addition to keeping track of the mileage and time for my riding, I logged everything I ate during that time. This way I could keep track of the additional calories I would be intaking while I was attempting to ride such a ridiculous number of miles.

After the first ten days I realized my arbitrary decision to make it 1,000 miles was foolish and that I couldn't do it. This does not mean I totally failed. I rode 329 miles in the first ten days, which actually put me on pace to make 1,000, but my day to day endurance had run out at that point. I could not continue to be on my bike for nearly three hours a day and function as a student. I did ride two to three days a week for the remainder of the month, but I did not have a specific goal any longer. As one would obviously expect, my appetite went through the roof. I was easily clearing 4,000 calories on the days that I rode 40+ miles. On the fifth day I consumed 4,450 calories, a day on which I rode 49 miles. In order to be sure I wasn't becoming a glutton, I weighed myself at the beginning and end of the month, and didn't gain any weight. On a non over-exerted day, I'm closer to 2,500. The extra 2,000 calories was going towards fueling my personal transport.

Basically, the extra aspect I would like to add to Michael Pollan's perfect meal is a direct purpose for the intake of the food; i.e., appreciating the food for what it does for us. If a person can eat a meal knowing that it is fueling their transportation, it is significantly more satisfying. Thinking about food in terms of fuel and cycles, as opposed to a stressful relationship with food that is laden with guilt, is so much more satisfying, and enjoyable. Although I wasn't necessarily eating the healthiest of foods, I was able to eat large quantities of food relatively guilt-free, which is something that I think many people are missing in their day to day lives.

One of the meals I ate during this time was spaghetti with sauce that I made in August from tomatoes I grew myself. The energy cycle I could see forming made it all the more fulfilling. I realize it may sound dramatic, but eating some of those meals became an almost spiritual exercise. I couldn't help but feel a sense of connectedness to a cycle much bigger than myself. Moments like this keep people humble, another life experience many people are lacking today.

Without delving too deep into any specific ideologies, a goal of the school would be to promote a general awareness of energy cycling within our own bodies, appreciating where the food comes from, how it is prepared, and how it powers our everyday activity. This awareness is paramount to being a well rounded person.

While I am hot on the heels of discussing bicycle riding, I am going to branch into another aspect of my commuting on the Homestead Trail. I would ride on the trail each morning around the same time (7:30am) into Lincoln for classes on both UNL's City and East campuses. The repetition allowed me to become aware of the daily patterns of life on the trail. Like clockwork for several weeks I would see the same flock of turkeys mulling about the trail in the same place. The same one every day would be the last to fly off into the trees, I know this because he had an injured wing and thus loped along before taking off. Nearly as often as the turkeys I would see rabbits chewing on the limestone and deer loping through the fields. When I rode home after dark I would often come across raccoons, opossums, and what I think was a badger (I didn't feel like turning around to find out for sure.) Hawks would sometimes glide along above me. One morning, before I was completely awake, a red fox ran across the trail about 10 yards in front of me, something I can't recall ever seeing before.

The types and number of animals I saw on my trips changed throughout the season, with less and less anything occurring once winter set in, including myself once snow fell. Obviously the plant life changed quite a bit during that time as well; from the leaves changing from green to yellow, orange, and red, and the corn and soybeans growing progressively taller and more dense until the combines showed up to haul them away to the elevators. Riding a bike allows these changes to be felt a little more personally than when they are viewed from a car or bus. That layer of metal and glass puts one in a vacuum that removes everything outside from being a real experience, it makes it closer to watching a nature program on television. I was fascinated by watching the deer bound across the fields rather than worried that they might total my car. I also

became interested in the behaviors of the animals. What were the rabbits after in that limestone? What interest did turkeys have in being on the trail every morning? I ended up doing a fair amount of self-initiated learning because of these encounters.

One last matter on riding a bike during the seasons is the necessity of paying attention to the weather. I had to be prepared for varied weather conditions, cold mornings and hot afternoons and maybe some rain. This meant I needed clothes to deal with all those conditions. It only takes one hour-long ride without warm enough gloves to make me remember to bring them next time. Commuting on a bike is much less forgiving than driving a car. I've seen plenty of people walking across in campus when its 25 degrees Fahrenheit in a t-shirt because they parked their car 50 yards from their class in a garage or live in the dorms and didn't need to be prepared for the weather. Riding a bike doesn't allow for that. Preparedness for the weather is something my nephews as well as the children at Prairie Hill are learning from being outside on a regular basis. I overheard the saying at Prairie Hill that there is "no such thing as bad weather, only unsuitable clothing." This is never truer than when riding a bike.

Applying Ideas for Future Learning

Taking the philosophies I have described, I will now move on to how to turn these ideas into a reality. In order to turn those experiences my nephews are receiving through my parents into a reality, a location for the 21st Century Educational Farmstead must be found. Several locations have been explored taking into consideration: number of acres, proximity to Lincoln, proximity to a bicycle trail, proximity to other nature areas, ability to be farmed, along with a willing owner. The location that seems most fitting is land owned by the University of Nebraska Foundation at 112th and Adams Road known as Prairie Pines. The 145 acres of Prairie Pines were donated to the UNL foundation by Walter Bagley who founded the property in 1959. It was donated with the intention of the land being used for natural resources education. A map of the property and some potential future plans is attached.

145 acres is plenty for the purposes of the 21st Century Educational Farmstead. This amount of land would allow for a farm operation similar to Shadow Brook, a bicycle shop like the Walton Trail Company, a smaller school like Prairie Hill, as well as other buildings necessary to make this "campus" functional.

As stated previously, Prairie Pines is located at 112th and Adams St. This is a location that has properties similar to the Walton Trail Company—a rural feel within a few miles of Lincoln. In addition, the David Murdoch trail ends a half mile north of Prairie Pines, just short of Havelock Avenue at 112th Street. At 48th and Fremont St, the Murdock Trail connects to the Dietrich Trail which runs from there to UNL's City Campus. With a short addition at the Murdoch trail's east end, Prairie Pines would have a direct connection to both of UNL's campuses by bicycle. Given the number of students that ride bikes at UNL, a bicycle shop shouldn't have too much of a problem developing a customer base, particularly if the shop were tied to the University and had the atmosphere of a Walton Trail Company. This location and school setting would also provide an excellent opportunity for teaching applied math and physics. Students would be able to observe the wide array of bikes that come into the shop and discuss the geometry of the bikes. I also imagine some sort of discount tune-up rate could be used if customers were willing to have their bikes used as practice work for students in a type of high school "shop class." It would function similar to the manner a person can get a discount haircut at *The College of Hair Design. Park Tool* a manufacturer of bicycle-specific tools publishes a teaching manual for bike mechanics entitled *The Park Tool Big Blue Book of Bicycle Repair. Park Tool* also allows for bicycle shops to participate in the *Park Tool School* using the *Big Blue Book* as well as a teacher's guide. More information on the program can be found at http://www.parktool.com/trade-resources/the-park-tool-school.

On the UNL website for Prairie Pines a listing of the property's attributes is given: "Included in this property are 20 acres of woodland containing more than 200 species of woody plants, 10 acres of virgin prairie, and 30 acres of seeded prairie grasses and wildflowers." This setting would easily lend itself to a variety of teaching opportunities. Currently, efforts to document all the species of plants and animals present are underway which, when completed, would further boost the learning potential. The property could perfectly blend a variety of land uses—virgin prairie, woodland, and cropland. A significant portion of the land has been used for crop production already, so building high tunnels, greenhouses and planting vegetable crops would not be a stretch.

Who Will Attend this School?

Ideally the school would be K-12, but having researched and visited schools with similar missions, I have found that the best strategy for implementation is to start with young kids—kindergarten through first grade. The school would grow by one grade a year. This allows both for the teachers and students to adjust to the thematic teaching style and the integration of an overriding philosophy. Basically, it would allow the school to slowly work out the kinks gradually instead of attempting to do so at an overwhelming scale.

The benefits of extending the school through high-school are numerous. First of all, after talking with Nigel Wittingham, director of the Prairie Crossing Charter School in Grayslake, Illinois, I've found that building alumni support is only possible with a high school. As director of a school that only goes K-8, Nigel expressed the difficulty in getting support from alumni. When students complete their primary education, the sense of community they remember is of grades 9-12, not elementary.

A higher level of education within the school could facilitate more interaction between University faculty, staff, and students and the students enrolled in the school. The high school students would feel more invested in the University system, and they will undoubtedly be more prepared for and aware of continuing educational opportunities. Dual-enrollment courses or preparatory classes could also be easily implemented. Essentially this would create a streamlined system of preparing students for enrollment in the University of Nebraska.

University Wide Commitment and Involvement

One can't help but imagine the wide-ranging possibilities for participation in developing and managing this property by the various departments at UNL. Some of the most obvious examples that come to mind are the following:

College of Architecture

-Students in the Architecture and Landscape Architecture Departments could be directly involved in the design of both the landscape and the potential new buildings at Prairie Pines.

College of Engineering

-Students interested in Engineering could work in tandem with the College of Architecture much in the manner that they did for the ZNETH homes.

College of Education and Human Sciences

-Students interested in Teacher Education would have an opportunity to design curriculums in the specialized setting and complete internships.

-Students interested in Nutrition and Health Science could have access to the food program for observation, analysis, and experimentation.

College of Agriculture and Natural Resources

-Some research projects are already taking place at Prairie Pines like the documentation of plant and animal species as well as weather monitoring. Studies of windbreaks could also take place. Others could easily be implemented.

I don't know what professors within the College of Arts and Sciences would like to use the facility for, but there is evidence that professors within the college are interested in teaching in an alternative setting. Anthropology Professor Mark Awakuni-Swetland and English Professor Tom Gannon are collaborating to offer a class at Cedar Point built around Indigenous subsistence strategies. The farm school would be in operation during the school year for use by the various departments. The close proximity to Lincoln would make it possible to visit during a normal semester schedule, something that is significantly less convenient with Cedar Point. Simply providing a more rural setting for classes could inspire creative teaching strategies.

In general, I imagine Prairie Pines serving as a demonstration facility—making the hard work and research being done across the University more visible and integrated. The public would have access to Prairie Pines and having multiple viewpoints represented in the facilities would attract a wide audience and promote a sense of community that seems to be lacking somewhat between the University and the general public.

Chicago Area Schools: Working Models for New Education

Over Spring Break I had the opportunity to visit schools in the Chicago area that are functioning in a manner similar to how the school at Prairie Pines might. Each one seemed to have a key ingredient the other two were missing. The three schools are *The Academy for Global*

Citizenship (AGC), The Chicago High School for Agricultural Sciences (CHSAS), and *The Prairie Crossing Charter School (PCCS).*

The Academy for Global Citizenship is a charter school near the Midway Airport in Chicago aiming to have students in grades K-8—currently they have K-4. This school seemed to have the staff and mindset necessary to create an environmentally conscious and sustainable community without access to fancy facilities or farmland. They have incorporated many of the concepts of a Montessori school although they are not explicitly one. The school was started in 2008 with only Kindergarten and 1st Grade. They have since kept those original students while adding a new Kindergarten class each year—allowing them to create the overall thematic experience referenced above.

The Chicago High School for Agricultural Sciences (CHSAS) encompasses the only working farm within the city limits of Chicago. The school is essentially a high school version of UNL's East Campus; students at the school are asked to select one of five "pathways" at the school after their sophomore year. Freshman and sophomore years are spent being exposed to all five pathways— Animal Science, Horticulture, Agricultural Finance, Food Science, and Agricultural Mechanics. The school is complete with a Farm Stand to sell products created in these pathways to the general public like zucchini bread (Food Science), flower arrangements (Horticulture) in custom display boxes (Ag Mechanics), and wool products and honey (Animal Science). The business side of the Farm Stand is handled by the Agricultural Finance Students. Missing from the school is a focus on sustainability, although that does not in any way mean they are not integrating sustainable principles in their learning, simply that a school like the *AGC* is more overt about those attempts. For example, *AGC* is making a concerted effort to support local farmers through their lunch program, while *CHSAS* does not incorporate any of the food produced on their site into their lunches.

The Prairie Crossing Charter School is a part of a 677 acre subdivision in Grayslake, Illinois (a suburb of Chicago) known as *Prairie Crossing*. The entire development was created with environmental stewardship in mind— all the homes are LEED certified, a functioning organic farm is incorporated into the development, as well as many acres of open prairie. The school buildings themselves are all LEED certified with geothermal heating, solar panels, and recyclable materials abound. Unfortunately the buildings were not designed with the students in mind, none of the technology put into them is visible and the students are not aware it. *AGC*

made an extra effort to make the solar panels they were able to purchase visible to the students so they could serve as a teaching device.

The school at Prairie Pines could use these three schools as models to create a campus with the best parts of each incorporated. Further information on each school can be found on their websites: http://www.agcchicago.org/, http://www.chicagoagr.org/, http://prairiecrossingcharterschool.org/. On AGC's website they include a link for a Resource Guide on Building your Ideal Sustainable Learning Environment found here, http://www.agcchicago.org/pdf/AGC_book_072310.pdf. Many of the aspects included in this guide fit perfectly into the philosophy behind the 21st Century Educational Farmstead—especially the "Walking School Bus," an effort to get parents and children to walk or bike to school instead of driving.

What Next? Steps for Responsible Action

I hope to have thoroughly expressed what I see as a huge opportunity for interested people in Nebraska at the local, state, and University level. Developing a "21st Century Learning Farmstead" that serves as a model for how education, food, health, and community connect could help solve many of today's most pressing issues. Obviously this proposal is only the foundation for much work into the future. A design committee will have to be formed in order to successfully implement these ideas. If Prairie Pines were to be used for the school, several of the most crucial aspects would already be completed—it has a recognized Nebraska Arboretum (something that cannot be created easily), old farm buildings, a chicken coop, an old farmhouse, and the current residence of Mr. Walt Bagley. Windbreaks have already been planted in the northeast corner that would be an ideal location for vegetable growing. Some additions that would be required are a location for a teaching bicycle shop/restaurant/farm-stand, a couple additional buildings for the school although the current buildings could partially suffice. Given the lifetime of effort Walt and his wife Virginia put into their land, it would be a disservice to build in a manner that did not integrate into the aesthetic of Prairie Pines. With this in mind, the committee would have to be composed of people from several backgrounds; education, small-scale farming, farm to school programming, landscape design, the bicycle and restaurant

business, and arboretum management. Many of the people I have already mentioned could serve in this design committee but more will be needed.

Some logical next steps in making this project a reality would be to fill out the core group of the design committee and then begin grant writing. Funding is obviously going to be an important part of this project and grants will undoubtedly be a necessity. Given the project's interdisciplinary nature, a wide-variety of grants should be available. Money from a planning grant is going to be the most important step. As stated, many of the most important parts of the 21st Century Learning Farmstead are already in place at Prairie Pines, more than I could ever have hoped for, but more work is needed. A phenomenal opportunity exists with Prairie Pines, one that could profoundly impact generations to come in a positive manner.

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