2007

Science, Technology and the Garden of Maine: Industrial Farming in Aroostook County, 1850-1900

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by

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Submitted in Partial Fulfillment of the Requirements of the
Senior Scholars Program

COLBY COLLEGE
2007

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Note to the Reader

If one spends long enough researching the history of Maine potato farming, strange things start happening. Words like seed drill, ring rot, drop axle wagon, and late blight start infiltrating your vocabulary. Warning! Unless this is curtailed, you will begin to lose friends, quickly. If you ever use the phrase “long, fleshy white tubers,” consider a different thesis topic.

Fortunately, none of those things happened to me.

Acknowledgements

One of the wonderful things about a small liberal arts college is that everyone I meet is fascinated by my research. As a result, I have had so many deep and thought provoking conversations about my thesis – conversations that profoundly changed my perspective on some bit of research here or there – that I could not possibly thank everybody who has helped me on this road. I will try to get to each person not mentioned individually, but if I do not, know that your presence was invaluable to this project.

This work leaves me indebted to so many people, and so many institutions. The highest credit goes to my advisor, Paul Josephson, and to my readers, Piers Hale and David Firmage. Jim Webb pointed me in the direction of the potato, and Jason Opal raised the notion of rural capitalism. I am forever indebted to the Independent Study Committee and to the Colby College Science, Technology and Society program for giving me the necessary institutional support for this endeavor

With regards to the research of this project, I am eternally indebted to Chuck Lakin at the Colby College Library. Kim Sebold and Richard Judd at the University of Maine were invaluably helpful in providing me with clarity of direction and access to source materials. Lindsay Braun at the Colby College History Department turned me on to the idea of a cadastral map. I am forever grateful to the Dean of Faculty Edward Yeterian for his generous support of this project, and to President William (Bro) Adams for funding travel expenses to present this material. This project would not be what it is without the amazing skill of my editor, John DeBruicker.

The entire Columbia River History of Science Group receives my warm thanks for being so receptive to an undergraduate speaker, but specifically I would like to thank Erik Ellis, Kristin Johnson, and Mark Largent for accepting my talk.

On a more personal note this project would never have been finished if it weren’t for the warm support of my roommates: Allyson Rudolph, Michael Dieffenbach, Ian Campbell, Rebecca Goldstein and Anna Green.

Lastly, but certainly not the least of my thanks goes to my family, to whom this work is dedicated.

Abstract:

In the mid-nineteenth century, northern Maine farmers existed amidst tension between capitalist and non-capitalist forces. This conflict is best described in terms of recent discourse on the question of rural capitalism, a topic debated by such scholars as Allan Kulikoff and Christopher Clark. This is an intricate and nuanced debate that this paper does not intend to treat with. Suffice to say, Maine farmers were caught between traditional social institutions associated with their trade that did not entail market production, and the rise of rural capitalism associated with burgeoning new markets.

However, by the turn of the century, northern Maine farmers, specifically those in Aroostook County, wholeheartedly embraced an industrial mode of agriculture that was consonant with the ideals of market capitalism. Four key historical actors aided in this shift. First, the rhetoric established by early state surveys of the county marginalized natural and local concerns in favor of a resource based perspective of the county. Second, the onset of railroads carried their own rhetoric of technological subjugation of the natural as a resource, and catalyzed an industrial revolution on the farm. Third, the subsequent mechanization carried with it it's own gendered language about nature and non-industrial farming that undermined a sense of community and any nascent environmentalism associated with non-capitalist farming. Finally, the onset of the grange and of several state institutions supplanted existing egalitarian structures of agricultural science and education. This shift from a bottom up flow of information to a top down flow carried with it the notion of state control of nature and scientific reduction of the environment. All of these forces worked to undermine the non-capitalist, or "self-sufficiency" mode of agriculture present at the middle of the century.

Introduction:

Aroostook as a microcosm

There are many ways to start the story of the Maine potato. Each tale has its own protagonists - each its own actors and circumstances. One could start with the potato's migration to New England from Europe in the 18th century, a journey from Old World to New. Just as easily, one could start with the lowly precursor to the modern spud in South America, as it accompanied European explorers back to their home continent, a journey from New World to Old. One could take the grander approach at talk about how the potato's emigration from and return to the New World initiated an agricultural revolution, and at the same time accommodated some of the most dramatic virgin soil epidemics in all of history. All of these narratives tell the story of a single crop at a trans-continental level, and are more about the potato in general than Maine's involvement with this root. The events and processes they describe are by definition global, and thus there is no need for extrapolation. All the universal laws having been laid out, these narratives ground an immense historical perspective. By providing the macroscopic view, the microscopic can be systematically deduced. Every individual moment must be contextualized within these greater forces: epidemic; revolution; famine; immigration; emigration … the list could go on indefinitely.

Yet there is still place for the microcosmic narrative. The macrocosmic narratives imply a history much like a pine board; the grain and texture are pervasive, and the local conditions always predictable. Yet any good carpenter knows that there are knots to every board. In these island locales, the rule of the grain doesn't fit. By studying the smaller, seemingly insignificant narratives we contextualize the greater macroscopic perspective.

It is through these microcosmic points, where larger narratives don't fit, that we must view the Maine potato. Maine's agricultural history was a microcosm exception to the greater trends shown in New England, which in turn was an exception to national trends. In each microcosm, the individual experience is crucial for our historical understanding, as it provides an alternative perspective onto the greater whole. So by studying Aroostook's exceptional agricultural history, we can better contextualize both New England's trends, and those of the US on the whole.

The pinnacle of Maine's potato industry was (and remains) the Aroostook potato. Yet this wasn't always the case. In the mid nineteenth century, Aroostook farmers grew a multitude of crops in a non industrial setting. At the close of the nineteenth century, however, Aroostook had fully embraced the potato as an industrial cash crop. This commitment, I argue, is the result of an economic, technological, and rhetorical framework that was established throughout the second half of the century.

Whenever possible, this narrative tries to incorporate a local perspective and affords agency to the farmers themselves. This is not always the case, and much of my argument relies of the agency of economic and technological forces. These concessions were made begrudgingly, as far too often do we forget that in every circumstance of economic change and technological development, the individual people affected have some agency.

This northernmost county of the Pine Tree State is colloquially referred to as "The Garden of Maine," or sometimes just "The County." I have appropriated these terms in this work.

Chapter 1:

An Introduction to Aroostook.

The Historiography of Aroostook

There have been only a few histories of Aroostook County, and even fewer that solely deal with its agricultural transformation. In many ways, Aroostook County put Maine on the map in the early twentieth century, and thus it is surprising that so few historians have focused on this fascinating region. Historians Edward Wiggin and George C. Collins, in History of Aroostook, v. 1,2, offer a technologically determinist account of Aroostook's rapid industrial development. Wiggin and Collins notably ascribe agency to the Bangor and Aroostook Railroad, and little else.

Historians Clarence A. Day, in Farming in Maine, 1860-1940, and Howard Russel, in A Long Deep Furrow: Three Centuries of New England Farming, primarily offer an environmentally determinist narrative of the rise of the potato. Day and Russel cite the well drained, frequently rained upon, limestone rich alluvium as the real cause for Aroostook's impressive potato crops.

Both of these narratives are quite compelling, and it would be remiss to exclude them completely from any narrative, however neither deserves absolute agency. Both complete technological determinism and complete environmental determinism fail to include several key forces that contributed to the industrialization of Aroostook Co. Neither narrative engages with the rhetorical dimensions of Aroostook's productivity. Considering that Aroostook takes the epithet "The Garden of Maine," it is surprising that very little has been studied in regards to Leo Marx's ideas about the "garden" metaphor, which he articulated in The Machine in the Garden. Nor did either of the narratives

address the implications of cadastral mapping brought up by James C. Scott. Nor did they mention Joan Scott's treatment of gender, especially with regard to the clearly misogynistic rhetoric espoused by some commentators. At no point was the role of the agricultural fair, club, or schoolhouse addressed in light of Anne Secord's work on botany in the pub. Furthermore, recent scholarship in the field of agricultural history by historians such as Deborah Fitzgerald, Steven Stoll, and Pete Daniel give us pause to reflect on the interplays between technology and agriculture. Thus, it is strange that Aroostook has gone unnoticed by the agricultural historical community, as well as by historians of science and technology. Aroostook has been the focus of some wonderful scholarship by Richard Judd of the University of Maine. His books, Common Lands, Common Peoples and Aroostook: A Century of Logging in Northern Maine raise important issues about natural resource management and conservation movements in northern Maine.

However, most importantly, the notion of the rise of rural capitalism, as was raised by Christopher Clark in his book, The Roots of Rural Capitalism is absent from any discussion on Aroostook's agriculture. Specifically, the tension between "rural capitalist" farmers and "self-sufficiency" farmers, as described by Allan Kulikoff in his article "The Transition to Capitalism in Rural America" (1989), does not appear in any of the literature with specific relation to Aroostook.

Rural Capitalism

The issue of rural capitalism is central to this work, so a brief elaboration of the relevant historiography is necessary. Kulikoff's work seeks to provide a broad historiographical analysis of the debate over the rise of agricultural capitalism, in the

hopes of illuminating a synthesis. Kulikoff argues that there are two sides to this debate, one informed by "neoclassical economics and economic history, and the other by social history and anthropology," specifically drawing from "the 'new' social history, the cultural Marxism of E.P. Thompson, structural Marxist theories, and various anthropological frameworks" (Kulikoff, 122). The economic side argue that capitalist sensibilities accompanied early American farmers across the Atlantic, and that "as markets developed and became more integrated, … farmers participated in them more fully" (Kulikoff, 122). The social history and Marxist theory side argue instead that the concept of a neoclassicist market, regardless of theoretical mitigations, is an unfair concept. Building on Thompson's concept of the Moral Economy (The Making of the English Working Class, 1963), the social historians argue that these early markets were dominated by use value economics, and not exchange value economics. "Markets in such economies are *places*, regulated by the state or custom, where people trade goods or labor and where merchants facilitate commerce over local hinterlands" (Kulikoff, 122-3). Clark weighs in on the side of the Marxists, noting that production was not intended to meet market demand, but rather to serve the needs of the community and of the family (Clark, 93). The "social" school of interpretation in this debate does not contend that there existed no market, and that farmers engaged in subsistence agriculture. Such terms evoke images of farmers growing a bare minimum and nothing more. A more useful term to use is "self-sufficiency" farming. In this mode, posited by Kulikoff, farmers grew enough for their families and for their neighbors, if necessary. "Most exchange was for the immediate use of the farm household or its neighbors. Farmers sought land … not to gain

profit (or even maximize utilities) but to maintain complex lineages and to sustain a traditional communal and noncapitalist *mentalité…*" (Kulikoff, 123).

Self-Sufficiency and Rural Environmentalism

It would be impossible to definitively answer the question of rural capitalism in this study, even with respect to Aroostook. However, I would posit that by the 1850s, farmers in the county existed in a state of tension between the noncapitalist and the capitalist forces. Confronted with changing economic circumstances, many farmers had to make hard choices about forgoing their traditional relationships to remain competitive. Richard Judd of the University of Maine, in his book Common Lands, Common People: The Origins of Conservation in Northern New England (1997), writes that most northern New Englander's remained reticent of the influence of capitalism. "Most upland farmers operated in a world of poorly developed market structures, unpredictable climate, and thin soils, and they compensated by growing much of their own good and spreading their income and their risks over a number of activities" (Judd, 60). Diversification became the antipode to capitalism. Indeed, many yeomen farmers held significant concerns over how industrial capitalism on the farm threatened their moral and spiritual connection with their environment. In regards to the answers of an 1873 New Hampshire Board of Agriculture survey, Judd writes: "The responses varied: some considered farming a remunerative; others, unrewarding; some advocated a return to self-sufficient farming … These contradictory replies reflect the cross-pressures that drove farmers to rethink the spiritual connection between the farm and the natural world" (Judd, 59). An incipient

form of environmental concern was brewing in this moral economy of traditional farming practices. This fledgling environmentalism stood at odds with the growing market based agriculture.

By the close of the nineteenth century, Aroostook was a major industrial agricultural region, that no longer felt the strain between rural capitalism and environmental traditionalism. I now turn to Aroostook to illustrate just how dramatic this industrial growth was.

Aroostook

Aroostook Co., Maine is huge. It spans an area about six times the size of Rhode Island. It is bordered to the south by a "great partitioning barrier of forest land, part of it scrub timber, a great deal of it cut-over" (Wilson, 18) and to the north by the St. John River.

The Aroostook River runs west from New Brunswick, winding through Fort Fairfield, Caribou, and Presque Isle, the population centers of Aroostook's agricultural eastern band. The two rivers meet in New Brunswick, across the boarder from Fort Fairfield, and then head east to the Atlantic coast. Much of the present area of Aroostook County was incorporated in 1839. From 1843-4 the county grew, acquiring land from Piscataquis and Somerset Counties.

In 1860, "Aroostook was as yet largely undeveloped and was isolated by forests from the rest of the state" (Day 1963, 3). The lumber industry supported the county's twenty-two thousand inhabitants. This was the result of a favorable arrangement with the Canadian government brokered by the Webster-Ashburton Treaty of 1842.[1] The deal

[1] This treaty was prompted by the bloodless "Aroostook War." This conflict was the result of a border dispute between the state of Maine and the province of New Brunswick. The position of the border had

allowed for the tariff free transport of Maine lumber through Canada on the St. John River to be shipped down to ports on the eastern seaboard (Day 1963, 127). Aroostook's timber resources are vast. The majority of the county's 6,700 acres hold mighty pines and firs. Only the eastern most strip running from Sherman in the south to Van Buren in the north is suitable to agriculture. This "potato belt," however, is some of the most productive land in all of New England.

In many ways, this history of Aroostook is the history of the industrial realization of natural resources, both silvicultural and agricultural. This study focuses on the agricultural exclusively, which provided more of a cash crop for the County in the early twentieth century, and garnered it a national notoriety. For example, the 1929 crop was approximately 42 million bushels (Day 1963, 135). That is approximately seven Exxon-Valdez's worth of potatoes.[2]

This impressive figure stands was a quantum leap from the pioneer days of Aroostook agriculture. Day gives the years 1840-1870 as "pioneer" farming years. During these years, farmers generally supplied lumbermen with necessary goods, such as "grain, hay and potatoes" (Day 1963, 127). Farmers produced primarily for their own consumption and this local exchange. Some products made their way south, however this was not a significant contribution to the wallets of the farmers. For the most part, Aroostook's rural population remained in a state of "self-sufficiency." Yet by the end of the nineteenth century, Aroostook's population was dependent on a national market and an industrial mode of agricultural production.

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significant implications for each region, as the disputed land held rich timber resources that foresters fought over.

[2] The Exxon-Valdez spilled 11 million gallon 20% of its cargo onto the Alaskan shoreline. My estimate of potato volume is based on the tanker's 55 million gallon capacity. Aroostook's 1929 crop could fill seven of these supertankers.

The Agents of Change

In Aroostook several historical agents catalyzed the transition from a self-sufficient, locally based market for agriculture, to an industrial, monocultural, mechanized, and scientifically supported system that produced for a national market. First, state surveys that relied on abstractions of nature, such as those provided by a cadastral map, lay the foundation for this transition. By providing a rhetorical basis for the commodification of the wilderness, these initial surveys created a consciousness of industrial development amongst state planners. Additionally, these surveys complimented the notion that rail traffic would be Aroostook's boon, which displays a common set of ideas concerning nature between bureaucrats and industrial capitalists.

This leads us to our second agent, the railroad. There had been numerous schemes to reach the county by rail traffic. These early plans held Aroostook as a crucial geographic nexus that would make Maine a trade hub for New England, the Maritime provinces, and the industrial Mid-Atlantic states. Aroostook's central place in these grandiose economic geographies indicates a commitment on the behalf of industrialists to the idea that the County's only purpose was as a quantifiable natural resource. Once the county was connected by railroads, Aroostook's agriculture revolutionized.

The third agent in the decline of rural environmentalism was subsequent farm mechanization. When railroads hit the county, starch factories popped up, farmers invested in more machinery, and gradually the county became a monocultural realm. At this point in the process, the logic of production changed, and the agricultural ideal became the factory. The onset of the railroad catalyzed a transformation to a mechanized and industrialized system of agriculture, one that espoused a quantitative and

authoritarian perspective of the natural – and one that in the modern era coincided with gendered terminologies and frontier imagery to present a land that had been harnessed by the reigns of science and technology.

Finally, the growth of agricultural science and education as institutions served as the final agent in this change Accompanying this transition to an industrial system, agricultural science and education migrated from the fields to the laboratories, and thus the state, empowered by professional scientific institutions, became the shepherd of proper agricultural techniques.

All of these agents served to wrest away control of the study and in some cases the practical means of agriculture away from the farmer. More and more, the rural Aroostooker became like Charlie Chaplin, caught in larger gears of industrial development. Most importantly, the shift towards industrial farming engendered uncompassionate attitudes towards the natural world, that, in turn supplanted the rural environmentalism associated with self-sufficient farming.

Chapter 2:

A Frontier to the North

On the morning of Thursday, May 31, 1838, Dr. Ezekiel Holmes met with his traveling party in Old Town and boarded a stagecoach for Mattawamkeag. His plan was to ascend the Penobscot river up to the Sebois, and follow that until he and his party could portage to La Pompique stream, which joined the Aroostook west of Ashland. Upon arrival in Mattawamkeag, a 50 mile journey north of Old Town, the expedition's boatmen proposed an alternate route, taking "the east branch of the Penobscot into Mattagamon Lake, thence up Hay Brook, and carry across the portage into Millinocketsis, a lake of the Aroostook" (Holmes, 11-12). With the route determined, Holmes and his party boarded their river ferries and headed north.

Holmes was charged by the Maine Board of Internal Improvements, an extension of the State legislature, to survey the Aroostook region and determine the value of her natural resources and the practicability of ensuring a water route to this northernmost tract. The Board asked state land agent Elijah L. Hamlin for a suitable candidate for the job. Hamlin could think of none other than his friend Dr. Holmes.

Ezekiel was born in Kingston, Massachusetts on August 24, 1801. His father, Nathaniel, had inherited the family smelting business, which was apparently lucrative enough to ensure the Holmes family some status within the town. Young Ezekiel was one of eleven children. All eleven children, mother, father, and grandparents lived in the house Ezekiel's great-grandfather built in 1733 (Day 1968, 3-5).

Ezekiel as a boy spent much of his time "fishing in the local ponds and brooks … [and picking up] Indian relics- stone axes, arrow heads, and the like…" (Day 1968, 7-8). He was an inquisitive child who adored his studies and excelled in school. He was keenly interested in the natural world around him, and would often watch as white hot iron flowed from the furnaces of the Holmes smelters, the product of rocks he undoubtedly came across in his boyhood adventures. As a result of this yearning intellectual nature, Holmes preferred the study of natural sciences to other subjects, although he was a fine student in many areas. At the age of sixteen he entered Brown University (Day 1968, 11-15).

Hamlin had been Holmes' classmate at Brown University. While undergraduates, both gentlemen were members of the Philophusian (now spelled Philophysian) society, a weekly discussion group open to students interested in natural science who could pay the sum of one dollar annually (Day 1968, 16). As such, Hamlin went straight to Holmes when contacted by the Board of Internal Improvements.[3]

However Hamlin's faith in Holmes was not the sole result of their personal relationship. At this point, Holmes was the closest thing to an agricultural scientist the state of Maine had. In September of 1820, the Philophusian society chose him from amongst their ranks to give a lecture at the close of the term, an honor usually afforded to outside experts (Day 1968, 17). After his graduation at Brown in 1821, Holmes studied medicine, first with his uncle Dr. Benjamin Chandler, and then at Bowdoin College. During his time with his uncle, Holmes exchanged geological samples with Professor

[3] Elijah was brother to Hannibal Hamlin, vice-president to Abraham Lincoln. Elijah and Ezekiel were close friends, and not above occasional mischief. One evening, the Brown boys along with some compatriots broke into the dining hall and chapel edifice and stole all the furniture, the bars and gates, and even the blinds of some of the windows. Hamlin was suspended for a few weeks as a result.

Benjamin Stillman at Yale and Professor Parker Cleaveland at Bowdoin (Day 20-21). In 1824 Congressman and future governor Enoch Lincoln appointed Holmes as a tutor of natural history and agriculture at the Gardiner Lyceum. In one years time he became a professor of both subjects.

The Gardiner Lyceum was a novel institution. Founded by Robert Hallowell Gardiner in 1822, the Lyceum offered secondary instruction in natural sciences instead of an education in Latin and Greek. Holmes detested the classical education he received at Brown, so this was a welcome change in curriculum. Additionally, the Lyceum offered elective courses, short winter terms, and was the first secondary school in the United States to teach agriculture, for which it received state funding. The Lyceum also contained a museum of "about a thousand specimens of minerals, a large collection of insects, and some plants, birds, animals, and fishes" (Day 31). There was even talk of establishing an experimental farm.

Despite his incredible commitment to his students and to the agricultural program at the Lyceum, Holmes resigned in the fall of 1829 after a bitter dispute with the board of trustees over appropriate levels of program funding. Holmes was hardly satisfied with his exit. Writing to his brother Asaph in February, Holmes lamented "…they were liberal enough to offer me $250 per annum as salary. I leave them poor and penniless, crushed down with a load of debt ... But I leave them with an invaluable treasure – a clear conscience. I have done my duty to them as far as it was possible for me, and had they seconded me as they ought, the institution would have been the pride of New England, and I should not be the football of my creditors" (Personal letter from Ezekiel Holmes to

Asaph Holmes, Feb. 1830, as cited in Day 1968, 39). Two years after his bitter departure, the Lyceum closed its doors as an agricultural college.

Despite this setback, Holmes's career in Maine's nascent agricultural science community continued to flourish. After leaving the Lyceum, Holmes became a key member of the Kennebec Agricultural Society. In 1833, while serving in the society, Holmes founded the Kennebec Farmer, an agricultural paper that catered to nascent agricultural societies. This early journal soon became known as The Maine Farmer, and grew to be the most prominent agricultural journal in all of Maine.

Holmes' scientific credentials made him the clear choice for the Aroostook survey. This is especially true given that the state was interested in a scientific and precise survey. By the time of Holmes' arrival in Aroostook, the entire county had been divided into longitudinal ranges with townships divided evenly by horizontal lines, forming a gridded space. This type of organization was a result of the Land Ordinance of 1785, in which the U.S. Congress divided all lands to be incorporated into grid-like townships, forming a cadastral map.[4]

The Cadastral Map and The Death of Nature

As James C. Scott points out, "The value of a cadastral map to the state lies in its abstraction and universality" (Scott, 44). Scott reminds us that even organization of space is a political artifact. By simplifying land via a grid, the state exerts control over that space, arbitrarily legislating the "significant" concerns from the "insignificant." Scott points out the intrinsically narrow nature of this type of survey by invoking the metaphor of a hedgehog, who knows "but one big thing," and a fox, who knows "many things:"

[4] A cadastral map is a grid-like survey, which in concert with a systematic survey, may be used to rapidly assess the land for various quantifiable values, such as commodity value, or resource potential.

> The scientific forester and the cadastral official are like the hedgehog. The sharply focused interest of the scientific foresters in commercial lumber and that of the cadastral officials in the land revenue constrain them to finding clear-cut answers to one question. The naturalist and the farmer, on the other hand, are like the fox. They know a great many things about forests and cultivable land. Although the forester's and the cadastral official's range of knowledge is far narrower, we should not forget that their knowledge is systematic and synoptic, allowing them to see and grasp things a fox would not grasp. What I want to emphasize here, however, is how this knowledge is gained at the expense of a rather static and myopic view of land tenure. (Scott 46)

There is a clear dichotomy in this metaphor. Scott establishes the tendency for states to adopt the synoptic view that can only perceive variables capable of interfacing with the measurement means. Gridded spaces, in the form of cadastral maps, provide a geometric model of quantifiable variables. Much like the technique of approximating an area under a curve with rectangles, a gridded space seeks to provide as close an approximation as possible to an aggregation of numerical data significant to a state across a given area. Both the cadastral map and survey, however, are limited by the fact that they can only account for a set range of quantifiable variables, and cannot address the unquantifiable, or indeed the "particular." This perspective contrasts with the myopic, but clearly focused perspective of the farmer or naturalist, who has a perspective that is compassionate towards ideas of local land use, intrinsic value, and ecological processes.

Historian Kate Brown of the University of Maryland comments on the power dynamic behind Scott's thesis in her article "Gridded Lives: Why Kazakhstan and Montana Are Nearly the Same Place" (American Historical Review, 2001): "My question, then, is – is it possible to write the history of gridded spaces … James C. Scott understands the grid as a way to simplify the opaque and complex quality of indigenous social practices so as to enhance the centralized power at the cost of local rule. In short,

the grid can serve as an apparatus for conquest, as a way to dominate space" (Brown, 22). Yet by dominating space, we exert control not only over "indigenous social practices," but also over the compartmentalized land itself. Historians Roger J. P. Kain and Elizabeth Baigent argue that the very practice of cadastral mapping commodifies land. "Perhaps of most crucial importance to the financially hard-pressed government authorities of the day, the uniformity of the land survey and alienation system 'provided a quick way to get land on the market in a mode perfect for speculation' … In this respect, the cadastral survey and map were the means for converting land into a market commodity" (Kain and Baigent, 297). The imposition of order upon a natural area serves as an extension of state control of that area. A synoptic state survey, cadastral or otherwise, must carry with it certain engendered ideas about local traditions and knowledge, as well as a system for valuing the natural world, which almost all of the time entails the abstraction of the land to the point of commodification. The cadastral map and the state survey, such as Holmes' survey, worked to these ends.

The State Survey in Aroostook

The agricultural history of Aroostook County for the second half of the nineteenth century is a narrative of the civilizing agency of human progress upon the natural frontier. The gridded nature of township maps laid the foundation for an unsympathetic treatment of nature on the behalf of the state, and Holmes' survey reinforced these concerns. Although his primary objective was to determine the practicality of a canal connecting Bangor to the Aroostook River, the Report described the entire county's natural resources in terms of their potential to be mechanized, or brought under the yolk of progress. Often times Holmes' party was forced to portage their boats from river to

river, a nuisance that Holmes often remarked on. While this point may seem trivial, his comments belie a greater set of ideas about the relationship between the State and nature. Specifically addressing the perils of portage, Holmes wrote,

> Everything must be done with main strength, and that cannot always be laid out to the best advantage. … It is true, that the men usually employed in this work are hardy and inured to the business, but this is no reason why they should be compelled to act continually as beasts of burden, when a little assistance from the State would change the routine of operations, and make what is now a most laborious and oftentimes hazardous task on of comparatively easy performance (Holmes, 17).

In this telling remark, Holmes urged the "State" to pacify the rough character of the land. When Holmes visited a river, he commented about its use as a transport thoroughfare. When upon a forested tract, Holmes noted the quality of the timber and the logistics of taking such timber to market. By describing natural features in terms of their economic utility, Holmes estimated their value in terms of their existence solely as a commodity. Furthermore, to Holmes land was only productive, and thus of any worth to man, if it had been developed and used to its utmost capacity. Undeveloped land was viewed as dormant and unproductive. Thus, a resource, such as agricultural lad was of the utmost significance, and Holmes did not understate the potential of the county's soils to produce lucrative profits. In the Report, Holmes wrote:

> It may seem exceedingly visionary to some, and appear like looking forward to a very far distant day, when the inhabitants of this section of our State shall consider these lowlands [the tracts between Houlton and Presque Isle] as amongst their most valuable property; and yet, by turning our eyes to the older countries, we find such to be the fact there, and learn that similar lands are sought after with avidity, drained and cultivated with great success and profit. (Holmes, 45)

According to Holmes the lowland tracts may seem unproductive and vile, however were the civilizing agency of human progress to be applied (i.e. drainage) their true potential,

and thus their true value might be unlocked. In commenting on Aroostook's soil capacity, Holmes discussed the County's ideal crops. It is notable that Holmes at first favored the cultivation of wheat. "The staple crop of the Aroostook farms is, and ever must be, wheat. For this the climate, and most of the soil, is exceedingly favorable" (Holmes 53). However, he went on to observe that "perhaps no part of New England is better suited to the cultivation of most of the culinary roots in use among us, than this. The potatoes raised in this country, when planted in season, are equal in quantity and quality to any whatever. The climate and soil both seem particularly congenial to this root" (Holmes, 62). While this cryptic endorsement of both wheat and potatoes certainly undermines an environmentally determinist telling of Aroostook's success with the potato, more significantly it shows Holmes' understanding of the potential of these northern soils. Prophetically, Holmes predicted the future importance of a direct rail connection to Aroostook in order to tap its potential. He continued, "nothing is wanting but greater facilities for getting them to market, to make their culture one of the most profitable branches of agricultural operations that can be pursued here" (Holmes, 63).

Holmes was not the first to comment on the agricultural potential of Aroostook County. In 1829, Moses Greenleaf, official reporter for the Maine Supreme Court, wrote in A Survey of the State of Maine (1829), "… [the soil] of the northern part of the State, on the Aroostook and St. John, is considered as far superior [to the soils of the northern states]" (Greenleaf 182). Holmes's view of the county, however, was revolutionary since he advocated for an industrial agricultural system governed by scientific principles (namely cadastral mapping and scientific farming) and managed by a state bureaucracy.

The foundation for such a system, arguably, was already laid out the moment Aroostook County became a gridded space.

While initial reports of Aroostook, notably those of Holmes and Greenleaf in particular give the impression of a state managed natural resource, Holmes also invoked the image of a frontier and an unforgiving wilderness when describing the county. In closing his Report, Holmes advised the prospective settler:

> If you are well situated – have a good farm live – live in a pleasant neighbourhood, and are blessed with the common goods and chattels necessary for the well being and happiness of your family, stay where you are – go neither east nor west. Are you a man of feeble health, with little capital, unable to undergo the sever toils of subduing the forest, and unable to hire? … Are you idle – lazy – shiftless and vicious? Go not thither. … Are you in straightened circumstances, but in good health, with a robust and hardy family of children to assist you? Go to the Aroostook. … be prudent and industrious, and in three years you can look around upon your productive acres and your well filled garners with satisfaction. Are you a young man just starting in life, but with no capital, save a strong arm – good courage, and a *narrow axe*? Go to the Aroostook; attend carefully to your business, select a lot suitable for your purpose, and with the common blessings of providence, you will, in a very few years, find yourself an independent freeholder, with a farm of your own subduing and with a capital of your own creating. (Holmes, 78, emphasis in original)

Aroostook was a land of untapped potential, so ripe for man's shaping that given "a strong arm – good courage, and a narrow axe" any man could prosper. Holmes presented the county as a panacea to natural resource shortages and as an enticement for men to move north. Perhaps Aroostook's charm may be an invention of Holmes' rhetorical flair. However many prominent Mainers considered the County to be the solution to all of their problems. The Pine Tree state was loosing her farming population to promises of a magical western frontier, even before the Civil War was to further cull Maine's ranks. Holmes feared a shortage of both natural and human resources, and Aroostook was the solution to both of these problems. In the winter of 1849, Holmes reprinted a

"communication, over the signature of 'A Smyrnaite in Aroostook County' from the Hallowell Cultivator, which tells an interesting story in relation to the farming in that section." In the Maine Farmer. Holmes quoted:

> It has been said by some of our farmers in this county, that it would not pay to plant corn, or sow wheat. In June, 1848, I took a crew of men, went into the woods and cut down 27 acres of trees on a south cant of land …the following ground was sowed and planted as follows: One and one-half were sown to rye, from which I received fifty bushels; three acres were sown to wheat, from which I received one hundred and twenty bushels; two and one-half acres were planted to corn, from which I received one hundred bushels of shelled corn; one acre was planted to potatoes, from which I received three hundred and fifty bushels of first rate potatoes (Maine Farmer, Dec. 13, 1849, 1).

Surely twenty seven acres providing around 620 bushels of product was tantalizing to any farmer contemplating heading west. His call to settle north reflects the perspective that Aroostook is essentially a panacea to all problems agricultural. Here lay a paradise garden to the north where any able bodied young man could make much more than a modest income; where unlimited timber, soil, and hydrological resources resided right in Maine's backyard. Holmes printed this snippet to help reduce the growing tide of emigration from the state.

> "We have often thought that there is a prevailing disposition to underrate [Maine's] own natural advantages, and to look abroad, where, often distance alone 'leads enchantment to the scene,' for the best field in which to seek competence and success. Multitudes have emigrated to the Far West or to California, who would, without doubt, have succeeded much better if they had turned their attention to the fertile wild land of our own State" (Maine Farmer, Dec. 13, 1849, 1).

For prominent agricultural men, such as Holmes, Aroostook seemed like a new Eden. Holmes' survey, as well as the gridded overlay forced upon the space, all confirm the interests of the state to exert control over a wondrous resource. The county was a solution to every problem, be it depopulation, resources or agricultural potential.

This perspective of a frontier paradise - a garden amongst the wilderness – lay the foundation for the industrial transformations to Aroostook agriculture. The notion of a cloistered, compartmentalized, and commodified space lent itself towards mechanical utilization by rail traffic and factory farming. The means by which this land was surveyed betrayed the intentions of the surveyors and their ideas about the land's value. A region gridded and surveyed in terms of abstract resources can only have value as a commodity. This type of valuation lies at the heart of industrial agriculture, and thus before the farm can become a factory, the land must become a resource. Once this crucial step was achieved, the resource had to be tapped – a railroad had to penetrate into the County.

Chapter 3:

The Railroad

As early as the late 1850s, rail proponents advocated for a northern railroad to stretch to the County from downstate. On February 10, 1858, "a large number of gentlemen, from all parts of the State, favorable to the construction of a Railway from Bangor to the valley of the Aroostook, met in Augusta" (Steinhauer, 143). John A. Poor, a critical figure in Maine's railroad history, representatives from Fort Fairfield and Presque Isle, and Joseph B. Hall, editor of the Aroostook Pioneer, were all present. The meeting was organized by General S. F. Hersey, with Hall acting as secretary. The purpose of the meeting was to secure a loan of credit from the state to help in the construction of a direct railway from Bangor to the Aroostook valley. Hall wrote in the Pioneer on May 4th, "We believe the successful completion of a railroad from the Penobscot to the valley of the Aroostook, eventually to connect, at some convenient point, with the road from St. Andrews to Quebec, will more largely increase the wealth and prosperity of Maine, than any other plan of internal improvement ever brought before the people" (Steinhauer, 145). The meeting was initially successful - on April 4, 1859 an act to construct a railroad to Aroostook passed the legislature and faced public referendum (Steinhauer, 148).

However, not all Aroostookers shared this enthusiasm for the plan. Some believed that the railroad bill would deprive the County's inhabitants of their land tenure rights, over tax current and future settlers, and strip funds away from bridge and road construction. Thus, on Saturday afternoon, May 21, 1859, a group of concerned Presque Isle citizens met in protest of the new bill. The meeting lasted well into the night. D.

Dudley, chairman of the anti-railroad meeting wrote that the railroad would "prove of much more damage than benefit to the State, and County of Aroostook – first, because by the 5th section, it repeals the best act on the Statutes, relative to the public lands, practically giving lands to the landless, without a guarantee of any thing like an equivalent – second, because the bill proposes to levy a money tax on each settler, after it shall become a law, which we fear will serve greatly to retard rather than promote the settlement of public lands" (Steinhauer, 155). When finally a resolution was reached, the dissident voices were broadcast across the state, stymieing any moves toward the establishment of a railroad – the bill failed the referendum.

The allies of the railroad bill were shocked to hear such rejections. Commenting on the dissenting voices, Hall wrote in the Pioneer:

> As an objection to our plan, it is argued that the road would not 'pay.' Those objectors must have an exceedingly limited mental vision. What! a railroad, opening to settlement a region of the country larger than the whole State of Massachusetts, and capable of supporting a population twice as great as that State now contains – with unlimited water power, and capabilities for manufacturing, that must be developed to realize their extent – with lumber of every description, in great abundance – and above all, as a foundation for permanent prosperity, with a soil unequaled for strength and fertility in New England – not pay? (Steinhauer 145)

Hall's comments depict Aroostook as a natural wonder ripe for use by man. His vision of a technological utopia amidst a natural frontier is not unique in the history of Aroostook's descriptions. Assistant Editor to the Pioneer Daniel Stickney also decried the apparent short sightedness of the anti-railroad meeting:

> Most of the gentlemen who accomplished this coup-de-etat 'still live,' and are emphatically the narrow-gauge men of our country. Their names have never been seen in any movement having for its object the development and improvement of the riches which God, in his wisdom and goodness, has spread all over the surface of our beautiful county, hidden away in its fertile soil, or which repose in our beds of lime, iron, and slate. The prospect is, that the blight and mildew of their influence will not cease until we have in Aroostook several respectable funerals! (Steinhauer 74).

While in the eyes of some, the antagonists of the bill were merely “narrow gauge,” the members of the Anti-Railroad meeting held grievances significant enough to sway the entire voting populace of Maine. The bill was all but approved until the report of the anti-railroad meeting was printed. The report reads, “…we are fearful that this bill is mostly a scheme of the most selfish speculators to put the public lands out of the way of a class of men who need them most, and who under the present free system of settling lands, are building up homes for themselves and a large taxable property for the State” (Steinhauer 156). In the wake of the Aroostook war, a conflict centered around the topic of land claims along the border, the notion of property rights was a hot issue. It is not surprising, therefore, that several prominent Presque Isle natives were able to sway the entire public opinion of the state with one manifesto.

This pocketed resistance highlights the tensions on the farm between capitalist and non-capitalist forces, as highlighted in chapter 1. “Selfish speculators” were viewed with disdain for their profit motivations and connection with State bureaucracy. Many Aroostook farmers, such as those at the meeting perceived the railroad as a rhetorical symbol of coming changes, notably industrialization, the onset of capitalism, and the increasing influence of State control. The railroad was an object with both tangible and rhetorical dimensions. Through its materialist consequences and its ideological imports, the railroad helped to drive Aroostook’s industrialization.

John A. Poor

In order to contextualize the initial Aroostook plan, we must examine the influence of John A. Poor, whose significance to the development of a Maine rail network cannot be understated. An early railroad proponent, Poor, a Bangor lawyer,

advocated for a railroad connection between the Maritime provinces and a Maine winter port. Historian Edward Chase, in Maine Railroads, identifies a transportation niche that Poor sought to fill, noting that "there was no important railroad built or building in Canada at this time" (Chase, 11). Primarily, the traffic of goods in Canada moved with the St. Lawrence River and her tributaries. While the construction of several significant canals, notably the Welland Canal that circumvented Niagara Falls, aided transportation down the river and her tributaries, winter navigation of this waterway network was virtually impossible. Poor envisioned Maine as an international trade nexus, linking the Maritime provinces with New England and the burgeoning markets in the mid-west. Aroostook lay at the heart of that nexus, bordering both the Maritimes and, by proxy with the rest of Maine, New England and its extensive rail network.

Poor was not the first to grasp the economic logic of this plan. Advocates of the Belfast and Quebec Railroad, which sought to connect Belfast with the Maine boarder, a plan that failed due to insufficient funds, had recognized the boon afforded by diverted Canadian trade. The Poor plan "was enthusiastically supported by the leading citizens of Portland," and garnered equal enthusiasm from Montreal (Chase, 13). Despite Bostonian attempts to divert the line through Massachusetts, Poor succeeded in completing the Atlantic & St. Lawrence Railroad in July, 1863 (Chase, 16).

While the Atlantic & St. Lawrence helped realize part of Poor's dream for Maine as an international railroad nexus, the railway was only the first of his accomplishments towards that goal. In 1850, Poor presented the European & North American Railroad plan to an international delegation in Portland. While all the parties present expressed a willingness to proceed with the project, a dispute between Bangor and the other

proponents arose, eventually sealing the fate of the European & North American. Bangor was still bitter about the timber depredations leading to the Aroostook War and the agreement on the Northeastern Boundary brokered by the Webster-Ashburton Treaty of 1842. Bangor's ideal railroad did not promote "national conciliation and good will" (Chase, 29), but would instead serve as a military road stretching to the St. John river in Aroostook to provide defense and communications to the potentially hostile boarder. In 1851 the major hurdle to the project was the construction of the length from Waterville to Bangor, the Penobscot & Kennebec Railroad. The British government offered all the sufficient capital to complete this stretch, however Bangor declined the opportunity, and the British withdrew their offer subsequent to the outbreak of the Crimean War in 1853.

Legislative action kept the charter for the European & North American railroad alive while an alternative was sought. The alternative came in the form of a rail connection to Aroostook County. The state legislature tried to allocate funds in 1859, but the initiative failed due to popular vote. The legislature succeeded in 1861, however insufficient funds and a refusal from Bangor to loan credit ended the project. Poor, however, had been striving to resurrect the European & North American. Poor garnered federal funds and removed a cumbersome law preventing the construction of a third, broad gauge rail west of Portland. This law had stood in the way of Massachusetts rail traffic, which operated on a different gauge. When the Civil War broke out, U.S. and British relations fell into strain, and the state granted the lands formerly allocated to the Aroostook project to the European & North American for defense of the frontier. The railway was constructed from Bangor through Old Town and Mattawamkeag and finally

through Vanceboro to St. John, falling too far south of Aroostook County to have affected its commerce.

It is important to note that in each of these attempts to link Maine's railroads with those of Canada and the rest of the northeastern United States, Aroostook was considered the keystone. Its rich natural resources and unique geographic position made it an essential locale in any railroad plan. This is significant, as it underscores how state and industrial leaders perceived the county, and by proxy, its inhabitants. Aroostook's primary value was geographic and economic. These values were aligned with industrial and capitalist notions of progress, namely that a railroad based economy that spanned large areas was a good and progressive thing. Thus, it is not surprising that when rail traffic finally reached the county, its first industry arose and its agriculture revolutionized. This process will be considered in the following chapter.

While some farmers were able to slow down the development of a railroad in the State, they were powerless to stop the Canadians. In 1862 the first of several railroads came to Aroostook from across the international border; the New Brunswick and Canada Railroad stretched to Richmond, New Brunswick just over the border from Houlton, in Aroostook. The next stretch of track to invade Aroostook came through Debec Junction and plowed straight into Houlton Village in 1870. By 1878, a branch of the New Brunswick rail system extended across the St. John River from Edmundston in New Brunswick to Madawaska in Aroostook, and a road traveled across the boarder into Fort Fairfield, Maine, through Caribou and into Presque Isle (Day 1963, 129).

Unfortunately, all of these tracks ran through Canada, making freight to U.S. cities exorbitantly expensive. Yet a route was still a route, and the County accepted the

increased access to trade. Within a few years of the arrival of Canadian railroads, several starch factories popped up along the potato belt. As a result, between 1869 and 1889 the annual yield of potatoes grew sevenfold (Day 1963, 131).

Yet to many Aroostook County natives, a direct railroad was the only option in the face of sky high Canadian freight rates. The first attempt since the 1858 debacle occurred in 1887, when the Northern Maine Railroad Company received its charter. It was unfortunately powerless to raise money for a railroad that many wealthy financiers thought would be an expensive ride to nowhere (Day 1963, 135). This occurred despite the influence of Mr. George P. Wescott of Portland, whom Collins described as "a man who stood high in business and financial circles of the Sate, was affiliated with many large and important corporate interests, and [whose] connection with the [1887] movement immediately gave it character and standing" (Collins, 28). Wescott agreed to personally ensure the construction of the railroad if the Aroostook population would supply $100,000 (Collins, 29). The Houlton population, however, became a gigantic stumbling block to this project. Collins lamented over these "near-sighted" individuals within Aroostook's borders blocking the railroad,

> Under the existing railroad status Houlton was the undisputed center of business for a great territory, and the continuous caravans of loaded teams which filled the highways leading into the towns from almost every direction in busy seasons, afforded grounds for the fears on the part of some Houlton citizens that when a direct railroad swept this traffic away, and the sections which contributed it became to an extent independent of Houlton, it would be a blow to the town's prosperity. The broader and more far-seeing people of the town argued differently… (Collins, 30).

Houton's disdain for the project, and the lack of financial backing spelled the end of the Northern Maine Railroad. This, however, was not the end of a move towards a direct line to the County. In 1888, Fred Atwood, of Winterport publicly advocated for an Aroostook Railroad at the New England Agricultural Society. Joining Atwood at this

meeting was Z. A. Gilbert, then Secretary of the Maine Board of Agriculture, but who was formerly the director of the Maine Fertilizer Control station, the state's first agricultural experiment station. Both Atwood and Gilbert delivered extensive addresses in favor of a direct line railroad. Gilbert said that, "Aroostook is a section peculiar to itself, differing geologically from any other section of New England. … In all of the vast expanse of soil so drained [by the St. John River] we find this peculiarity, a soil which lies on vertical bed-rock, which gives natural drainage. We have thus a soil notonly fertile, but one which offers to the husbandman the ready conditions for responding with the very best results to the intelligent application of labor" (Gilbert as cited in Collins, 35). Gilbert's comments indicate a union between industrial agricultural interests, agricultural science, and the railroad plans. Gilbert was not the only one to connect the railroad with the natural resources of Aroostook. In the Kennebec Journal, in November, 1890, Joseph H. Manly, of Augusta, spoke about how a railroad to the County was in the state's interest. "The great need of Maine today is more railroad, especially a line to tap the immense resources of fertile Aroostook" (Manly, as cited in Collins, 38).

In 1890, the chief figure of the direct line movement was Albert A. Burleigh, although it seems as if he was merely a figurehead of this group. Indeed, the real agency behind this plan goes to the efforts of Edward Wiggin, co-author of History of Aroostook with George Collins. Wiggin appealed to the Aroostook Ponoma and State Granges, which at the time held immense political power (chapter 5 elaborates on the political power of the Granges). The state and local Granges pledged their support for the "Burleigh Plan," which entailed the public's support for the railroad, and in 1891, the Bangor and Aroostook Railroad was given a state charter (Collins, 42).

The Bangor and Aroostook Railroad, completed in 1892, was a civilizing agent upon the wilderness. In 1902, journalist Clarence Pullen authored In Fair Aroostook, a pamphlet advertising the towns along the Bangor and Aroostook. In fact, the railroad company funded the pamphlet's publication. Pullen, wrote, "There are two major notes in the impressions borne upon the traveler in the journey northward from Brownville, over the Aroostook division of the Bangor and Aroostook Railroad. One is the sylvan charm of the landscape; the other is the sense of the great industrial productiveness of the region into which he is entering" (Pullen, 7). The road was symbol of modern railroad technology, featuring heavy steel rails, iron bridges, and gentle slopes and curves. The rough terrain traversed by the railroad, however, "perpetuated the pioneer tradition," as if the railroad was forging ahead into uncharted territory. "Statistics of autumn shipments of deer, caribou, and moose furthered the impression that it was a huntsman's road" (Kirkland 491-2), and perpetuated the notion that the railroad, a marvel of modern technology, could bring this wilderness under the yoke of progress.. This artery of transportation was a powerful symbol of technological mastery of the wilderness. The wild and remote county, once brought under the yoke of agricultural progress, could now be tamed and constrained so that urbanite fishermen[5] could marvel at her wonders. A

[5] And fisher-women:

"Ladies there are among them. Dianas of the rod and line, who have discovered the charm of the wildwood, and who choose, in the Maine lakes, to angle in stiller, clearer waters than those in which are cast the flies of fashion. Moreover, 'Woman, lovely woman,/ Quiet divine, so sweetly human,' finds no discomfort in the pervading consciousness that no gloves and veilings [sic.] are so becoming to the fair hands and face as bronze gifts of the sun, and that grace and animation are never more effectively inspired than by the enthralling exercise of matching a six-ounce rod and a hundred feet of braided line against the turns and rushes of a square tailed trout. And all these advantages thrown in with exuberant health and exhilarating sport.

The question of suffrage may wait, but her enfranchisement into the pleasures of the canoe and fly-rod is a right that no woman will ever give up to the monopoly of main again, once she has experienced the fun of going a-fishing" (Pullen, 12-3).

train north would carry sportsmen to conquer the frontier. A train south would carry the fruits of man's technological mastery, carloads of potatoes, and the spoils of the hunt.

For Charles Murrow Wilson, in Aroostook: Our Last Frontier, 1937, the county was a land of unbridled optimism. "Aroostook talk is lusty with rare, breezy optimism, suggestive of the once unbounded West. There is spontaneous comradeship of men at work or at adventure; men who rub elbows, spit, and sweat, rather than men who fondle palms, sniff, and doubt. It is West, an earlier and more free-spirited West gone pell-mell and boundlessly East … And it's a man's country; a truly masculine-minded America, a society built and maintained by virile masculinity" (Wilson, 12-13). Wilson's writing is chock full of the language of masculine triumph over that which "fondles palms." For Wilson, Aroostook is "free of the oriental influences of the Maine coast, the pagodas and fanciful hangovers of China voyages in the days of the great three-masters" (Wilson, 17). These views reflected the general impression of nature as feminine and capricious to be mastered and controlled by science which was masculine and objective. By framing the pioneers of the county as masculine Americans who don't "fondle palms," Wilson frames the nature under their subjugation as feminine, un-American, and "palm fondling." This was the post railroad Aroostook, the result of the industrialization of the garden.

While the parties involved in Aroostook's various attempts at direct rail connection were not always the same, their rhetoric has a common theme. The County was perceived as an instrumental resource, due to its natural fertility, frontier charm, masculine character, geographic position, or economic utility. Often this sentiment explicitly drew the connection between Aroostook as a natural resource, and Aroostook as an industrial agricultural region. While the railroad had clear agency in Aroostook's

transformation, so did the idea of a railroad as a technological domination over nature. The next chapter will explore the industrialization on the farm, and how its rhetoric and technologies furthered this move towards industrial capitalism in a rural setting.

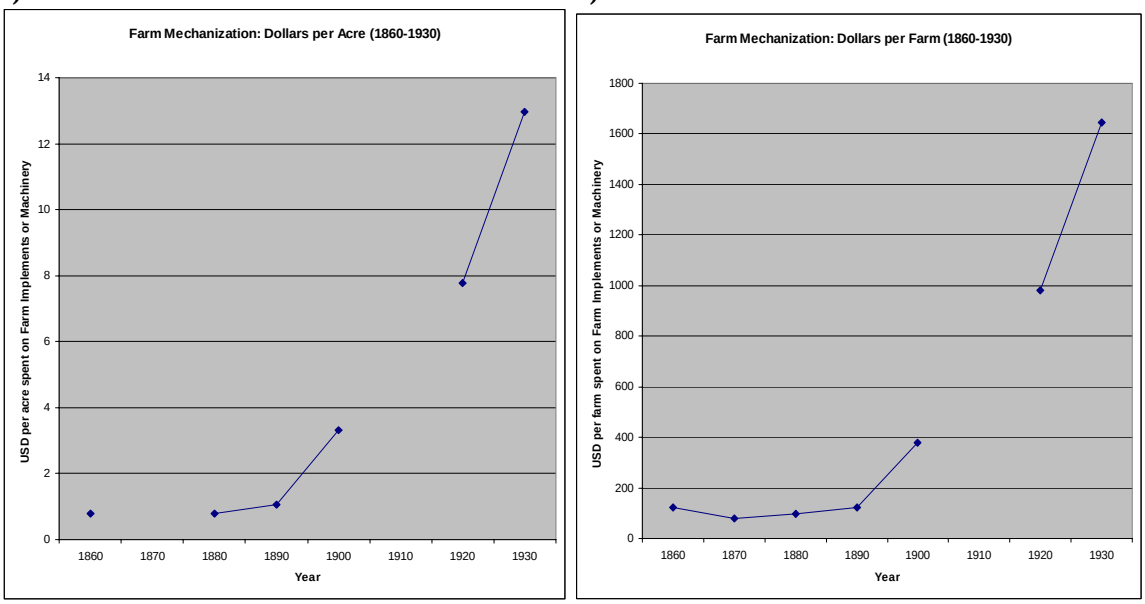
Chapter 4:

The Rhetoric of Mechanization

When railways from Canada arrived in the 1870s and ‘80s, a significant enough market opened up to foster a fledgling starch industry in Aroostook. Census data for specific crops produced is not available before 1880, after the railroads came in from Canada, however we may extrapolate backwards. According to Bulletin 413 of the MAES, “A Study of Land Use in Thirty One Towns in Aroostook County, Maine,” by station economist Andrew E. Watson, Aroostook’s potato acreage rose from 14,000 acres in 1880 to 17,000 in 1890, and then jumped to 42,000 in 1900, triple the amount twenty years prior. The large jump to 42,000 acres is most likely the result of the direct line railroad arriving in Presque Isle in 1892. This new connection spurned on increased production and enticed more and more to expand their operations. There is a 20% increase in the acreage of potatoes between 1880 and 1890, however the last of the Canadian railways, running through Edmundston, and branching down through Fort Fairfield and into Caribou and Presque Isle arrived in 1878 (Watson, 60). Thus we may ascribe this increase to the final Canadian railway. When the Bangor and Aroostook Railroad finally reached the county, potato production, mechanization and acreage of farms rapidly rose. Census statistics reinforce this trend. The amount of dollars spent per acre on farm machinery began to rise exponentially around 1900, eight years after the railroad. This trend continued beyond the 1920 census (US Census reports, Eighth through Fifteenth, data interpreted by author).

Figure 1:

a) **b)**



(Amounts are corrected for inflation to 1940 dollars using the Consumer Price Index. Holes in the graph are due to insufficient Census data)

The value of dollars spent per acre is an appropriate tool for gauging increasing capital investment into farm implements, specifically in telling the increasing complexity of such implements. Unlike additional seed or fertilizer, the amount spent on implements does not increase with acreage, but rather increases on a per acre basis. Census data gives the amount of dollars spent on farm improvement per decade. After adjustments for inflation, this total was divided by the acreage to correct for an increase in average farm size, which could have masked any quantitative determination of mechanization. To bolster the data, the sum dollars spent on farm improvements was also divided by the number of farms. This would provide any correction for a change in the number of farms.

As is clearly evident from the data in figure 1, the amount of US dollars spent on farm improvements per acre and per farm increases exponentially somewhere in the early 1890s. It is safe to assume that this dramatic increase is the result of the direct line railroad.

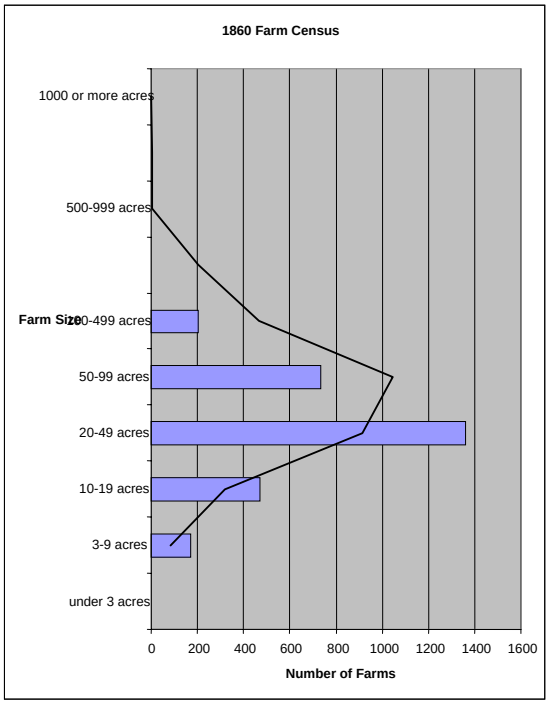
When the direct line finally came to Presque Isle in 1892, Aroostook's potato culture took off. Spuds became a new cash crop, and many fortunes were made and lost on this "white gold." In addition to farm mechanization, farm size increased as well, and, as Collins pointed out, so too did the risk involved in farming:

> In due course of time farming became less a legitimate business than a gamble, which was participated in not only by the farmers, but by the non-farming classes, who speculated in buying and raising potatoes. …each succeeding year more and more potatoes were planted and more trainloads of fertilizer were rolled over the tracks of the [B.A.R] … to supply the needs of the Aroostook farmers. It finally became so that he was a moderate farmer who did not have a fifty acre potato field, and he only was a big figure in the business whose plant did not reach one hundred acres, and sometimes double that acreage. (Collins, 76-7)

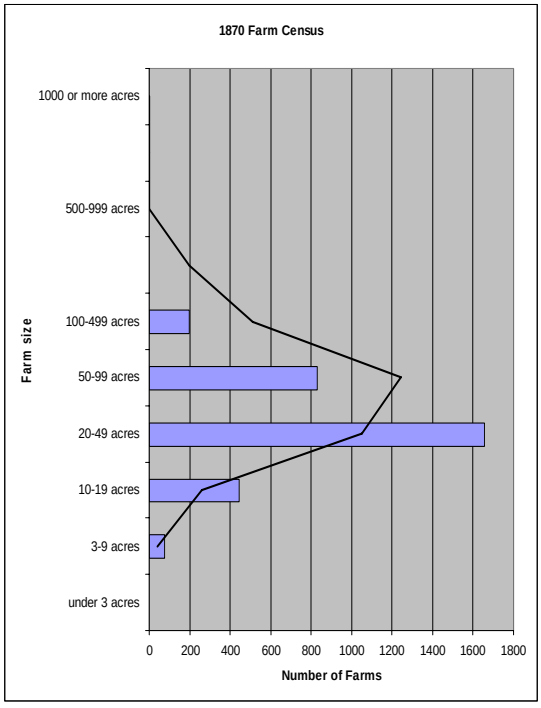
The entire economy of the county became rooted in potatoes. Farm size shot through the roof, as did the number of acres of potato fields. These Census figures detail the dramatic shift in farm size profile Note figures 2a – 2i, which show the structure of Aroostook farm size per decade from 1860 – 1940 (US Census reports, Eighth through Fifteenth, data interpreted by author):

Figure 2:

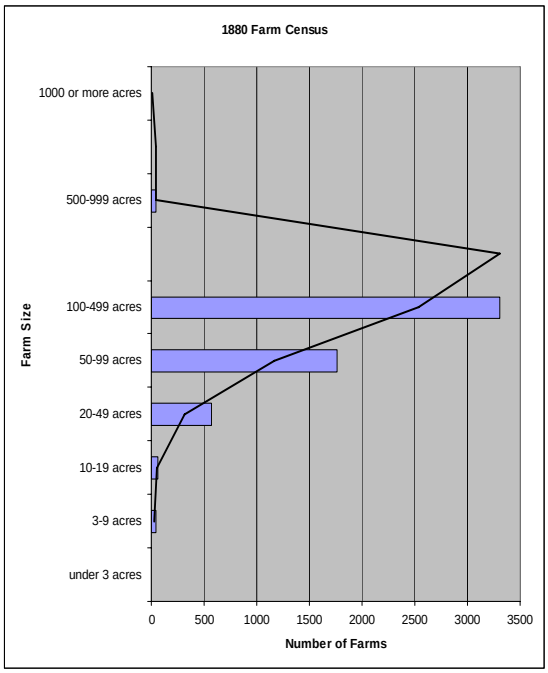
a)



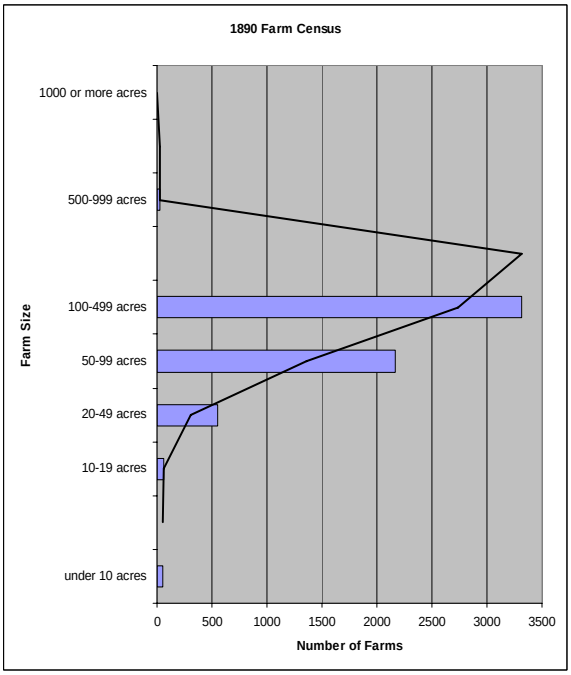
b)



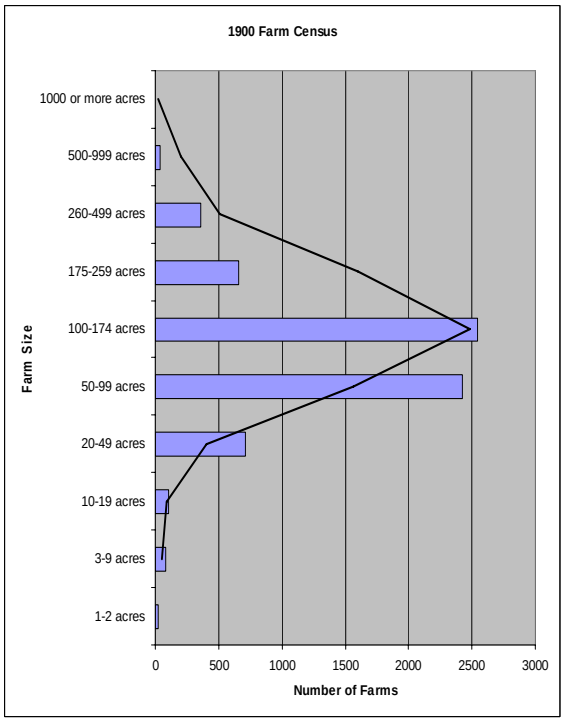
c)


1880 Farm Census
1000 or more acres
500-999 acres
100-499 acres
50-99 acres
20-49 acres
10-19 acres
3-9 acres
under 3 acres
Farm Size
0
500
1000
1500
2000
2500
3000
3500
Number of Farms

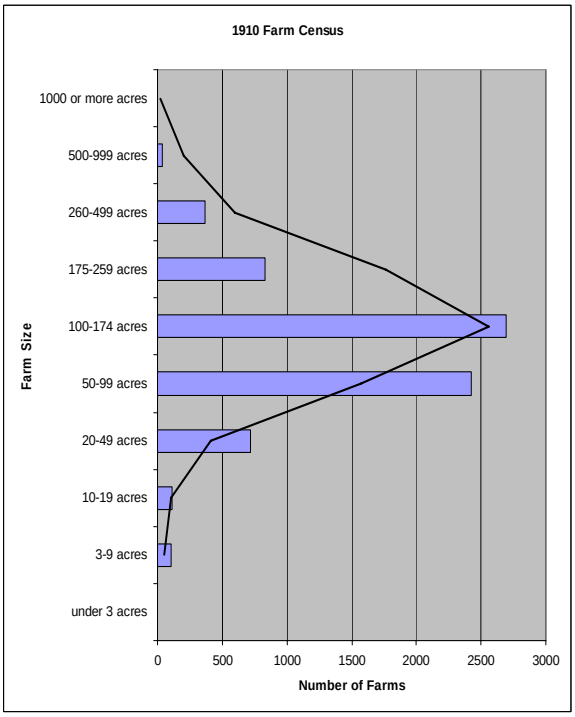
d)


1890 Farm Census
1000 or more acres
500-999 acres
100-499 acres
50-99 acres
20-49 acres
10-19 acres
under 10 acres
Farm Size
0
500
1000
1500
2000
2500
3000
3500
Number of Farms

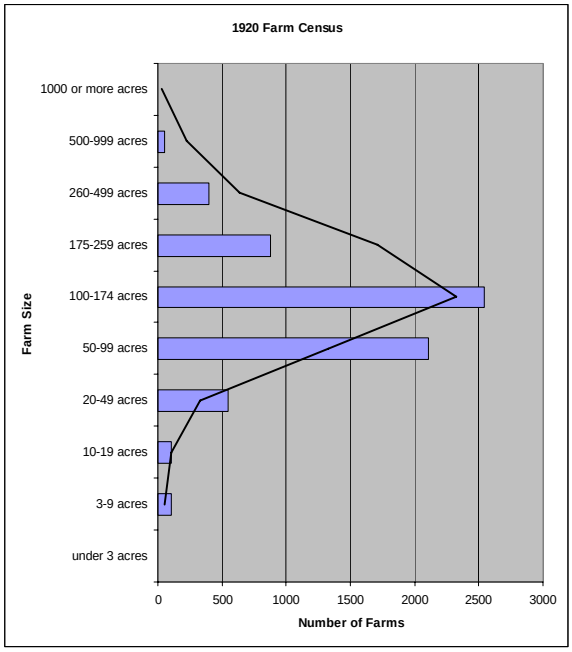
e)


1900 Farm Census
1000 or more acres
500-999 acres
260-499 acres
175-259 acres
100-174 acres
50-99 acres
20-49 acres
10-19 acres
3-9 acres
1-2 acres
Farm Size
0
500
1000
1500
2000
2500
3000
Number of Farms

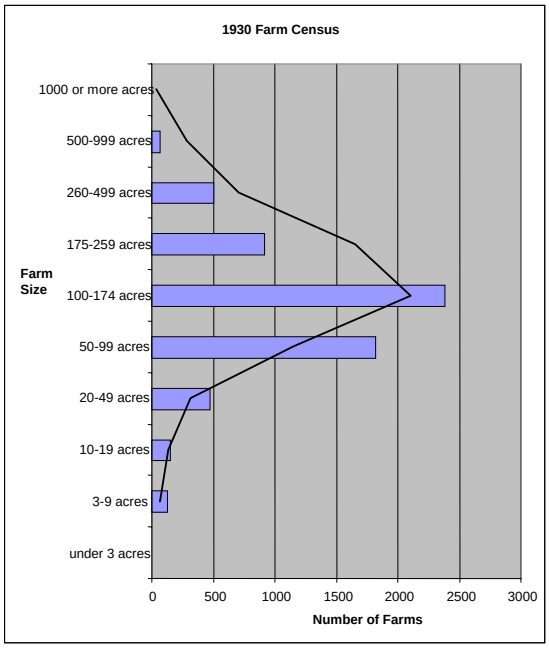
f)


1910 Farm Census
1000 or more acres
500-999 acres
260-499 acres
175-259 acres
100-174 acres
50-99 acres
20-49 acres
10-19 acres
3-9 acres
under 3 acres
Farm Size
0
500
1000
1500
2000
2500
3000
Number of Farms

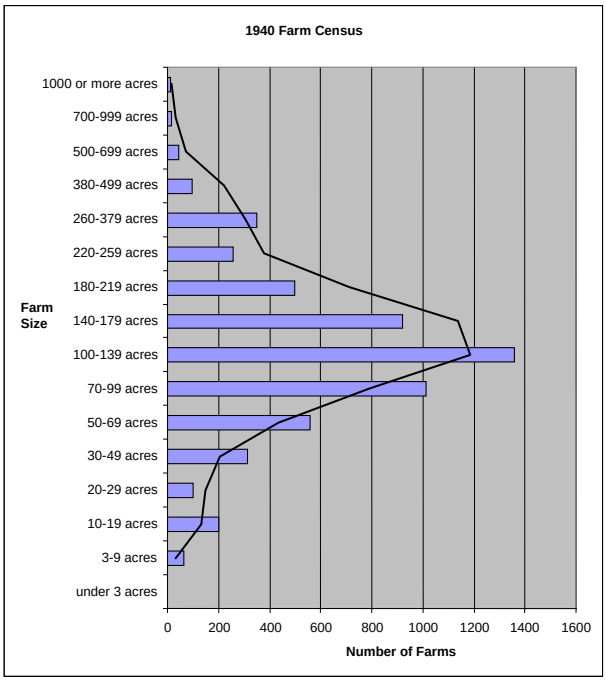
g)



h)



i)



Notice the shift towards larger farm size in the years between 1870 and 1880. As size increased, so did farm specialization, and in turn so did farm mechanization. The railroad dealt the death blow to non-industrial agriculture. After 1892, no longer could the small farmer compete in this industrial, and market based system.

Evidence of this marked change over the course of a few decades comes not only from statistics, but can be inferred from commentary on the county and documentary evidence. In his 1902 pamphlet titled In Fair Aroostook, author Clarence Pullen had the opportunity to survey the potato fields of John Watson, a starch manufacturer and merchant from Houlton. Pullen writes:

> "Here his men were planting potatoes – with a machine, of course, for from the time seed potatoes are cut for planting until the crop is dug all the work in the field is done by machinery. The land has been ploughed and then harrowed smooth; the planting machine was about four feet long, with a magazine of commercial fertilizer in front, and one of seed potatoes in the rear … The machine, as the horses drew it steadily along, made the furrow, dropped a portion of fertilizer in it, covered it with earth, dropped a seed potato upon the earth above the fertilizer and covered it, and repeated this process at intervals of a foot to the end of the row" (Pullen, 83).

Pullen continues on, describing mechanical cultivators, and diggers. The only process not mechanized is the hand picking of the spuds once dug by machine from the ground. Most of the implements Pullen describes are horse drawn and operate by traction. By 1920, however, mechanical tractors, as well as horses pulled potato machines. In a 1922 USDA documentary The How and Why of Spuds, highly specialized farm machinery cruises down Aroostook fields. While the documentary details both tractor and horse drawn methods of using potato machines, such as diggers, sprayers, cultivators, and seed drills, mechanization by internal combustion engine was likely the predominant mode by 1920. Historian George C. Collins commented on the prevalence of automobiles in the County. "Probably nowhere else in the United States is there a section of equal population where automobiles so abound as in Aroostook" (Collins, 109). Collins continues his discussion of Aroostook's enthrallment with the internal combustion engine:

> "Assume that Aroostook were wide open alcoholically speaking, on no holiday of the year would so many gallons of grog be poured down the necks of merrymaking crowds

> as are pored into the tanks of motor cars on any pleasant Sabbath day in summer, when Sunday joy riding is at high tide" (Collins, 110).

Although Collin's enthusiasm for gasoline powered machines may have stemmed from prohibition banning other volatile fluids, his account provides a strong gauge for farm mechanization. While his account describes cars exclusively, we can assume Aroostookers had similar zeal for tractors. Where the car went, the tractor followed. Lacking the soft, rubber tires of later agricultural technology, these machines used spiked steel wheels and tank treads, a design feature borrowed from World War I mechanized weaponry. Much as metal beasts rolled down the battlefields of Ypres and Verdun, these new tractors would wage a war of production against nature.

In 1942, Andrew E. Watson, agricultural economist for the Maine Agricultural Experiment Station, commented on the influence of railroad access on the development of the county:

> "As an outgrowth of the early realization that the soil and climatic conditions of the County were ideal for potato production, potato starch factories were established. The advent of the railroad gave the inhabitants of Aroostook a means of getting their products to markets outside the area. The provision of an outlet for produce resulted in rapid agricultural expansion and development in the County. There was a shift from the production of pressed hay and potato starch to a general specialization in the production of table stock and seed potatoes. As a result of this specialization, Aroostook County has developed into one of the world's leading potato producing areas" (Watson, 59).

While it is entirely possible that specialization alone led to Aroostook's potato boom, the yields of potatoes produced, which allowed Aroostook to compete in a national market, were only possible by the exorbitant fertilizer usage. Wilson writes:

> "In manly forwardness Aroostook defies any gospel of scarcity. Its rich earth yields plenty. Plenty is honorable. Ask any citizen who plants and operates a quarter or half section of a square mile in potatoes! Aroostook is one of the few farming realms of America wherein soil already rich grows perpetually richer. Twenty-five years ago [1912] 300 pounds of commercial fertilizer to the acre was a fair average. From that the practiced donation of concentrate climbed to 500 pounds, then to 1000 pounds, 2000 pounds, even 3000. Recently 'double-strength' fertilizers have been introduced, which means that actual additions of soil nutrition has increased as much as twenty-fold during a generation's time" (Wilson, 33).

The narrative of optimistic opportunism, indicated by Wilson's comments about the rich earth, is underwritten by the ritual of increased fertilization. In this case, fertilizer technology ensured the opportunistic enthusiasm of this northern frontier.

The mechanization of Aroostook's farms was inherently linked to the onset of direct rail traffic, as was evidenced by census statistics. Thus, the rhetoric of mechanization and industrialization was also linked to the onset of the railroad. Both provide a provocative image of a modern industrial technology harnessing an untapped wilderness. Collin's enthusiastic commentary on the automobile's place in Aroostook, when considered in the context of the rise of agricultural machinery, identifies the rhetoric of Aroostook's industrialization.

Perhaps the best example of the rhetoric of industrialization comes from Charles Morrow Wilson. As was mentioned in the previous chapter, Wilson's gendered language gives us pause to examine the politics of Aroostook's technological transformation. Wilson wrote, "Aroostook talk is lusty with rare, breezy optimism, suggestive of the once unbounded West. There is spontaneous comradeship of men at work or at adventure; men who rub elbows, spit, and sweat, rather than men who fondle palms, sniff, and doubt. It is West, an earlier and more free-spirited West gone pell-mell and boundlessly East … And it's a man's country; a truly masculine-minded America, a society built and maintained by virile masculinity" (Wilson, 12-13). Writing in the wake of Aroostook's industrial development, Wilson's clear dichotomy between the "frontier man;" who adventures, works, rubs elbows, and spits; and the "palm fondler," aligns well with the other implicit dichotomy in his writing – the natural frontier and the artifice of man. The adventurous, hard working, virile man is symbolic of the technological forces imposed upon the

natural setting. The “palm-fondler” represents a feminized and capricious nature, which modern industrial technology subsequently subjugates. This analysis echoes the concerns of Carolyn Merchant, which she indicates in her book The Death of Nature. Merchant explores the gendered assumptions behind the western technoscientific tradition, especially in regard to its exploitation of women and the environment, by exposing its historical roots as a gendered idea. From this theoretical standpoint, we may criticize the rhetoric of the railroad, and of the mechanization of Aroostook as anti-natural, and as ascribing a gendered relationship to machines and nature.

Chapter 5:

From Agricultural Societies, Clubs, and Fairs to Extension, Experimentation, and the Grange: Institutional Changes in Agricultural Education

On Monday, October 5, 1858, Edward Elwell, editor of the Portland Transcript, began the arduous journey up to Presque Isle from Houlton. This three day trek from Bangor was the capstone to at least a week in transit from Portland. Early Wednesday morning, Elwell left the roadside lodge that he and his stagecoach driver had stopped at along the way and began the final leg of his passage to Presque Isle. Along this last section Elwell commented on the surrounding terrain. "We have not been in the land of fogs, granite boulders and dead pine trees, but up North, where the air is clear and pure, where the land lies high and rolling, covered with a magnificent hard wood growth, and not a granite ledge to be seen within forty miles of it" (Steinhauer, 93). Elwell's enthusiasm for the northern terrain was in part to dissuade the popular notion that Aroostook actually lay "down east," along the craggy coast, and was in part a comment about the natural vivacity of the county.

Upon arriving in Presque Isle, Elwell met with Joseph B. Hall, editor of the Aroostook Pioneer, the Presque Isle newspaper. Hall proceeded to show Elwell around town, which inspired him to comment on the warmth and kindness of the Presque Isle residents. On the following morning, Elwell, Hall, and several other journalists and prominent Presque Isle citizens set out for the Aroostook River to visit the surrounding farmlands. Elwell was already impressed by serenity of this bucolic scene. He wrote on the river:

> This is an oats-raising country and the horses have the benefit of them. The first glimpse of the Aroostook drew exclamations of the delight from all the party. It is a beautiful river, flowing quietly through the deep forest, like a sweet child wandering in the wilderness, and dallying with the flowers by the way. Its valley affords the best settling lands of the county, and when under full cultivation must become the garden of Aroostook (Steinhauer, 93).

Elwell's descriptions of the valley recalled an idyllic garden scene. The image of a garden featured prominently in Elwell's writing. Later in the day, Elwell visited the Allen farm, a gigantic tract outside of Presque Isle. Allen had 600 acres, half of which were cultivated and half which remained a woodlot. Allen grew buckwheat, rye, wheat, and oats in abundance, and Elwell was most impressed by Allen's productive lands.

By the afternoon, Elwell made his way to the annual fair of the North Aroostook Agricultural and Horticultural Society. Elwell was one of twenty-eight editors invited to the fair by Hall. From their accounts we are able to construct a relatively accurate description of the day's events. As the journalists were busy all morning, they missed the livestock shows, yet from the premium lists we know that J.W. Haines won prizes for his cattle. The Bean family raked in awards for crops, as well as their young colts. That farmers often won premiums for livestock as well as crops indicates that they predominantly farmed multiple products (Steinhauer, 57).

The North Aroostook Agricultural and Horticultural society had ran the fair since 1850. J.W. Haines was the first chairman of the society. The group held regular meetings, in which some members gave papers. Occasionally, a guest speaker would address the society, such as Aroostook farmer Edward Wiggin did at the Boothbay Harbor Agricultural society, in 1883. Wiggin discussed strategies for effective management of agricultural societies (Wiggin 1887, 5). In all of these meetings, by discussing their trade, members would conduct nascent agricultural science and education.

In the mid-nineteenth century, agricultural science and education existed in a democratic and egalitarian sense in the form of institutions such as the county fair, the farm club, and the agricultural society. However, as the farm became an industrial setting, and as the grange came to Maine, this proto-institutional science migrated from the fields to the laboratory. Institutions such as the Experiment Station, and the College of Agriculture took the reigns of agricultural science from the farmers.

Aroostook had a unique relationship to this shift in the setting of agricultural science and education. Often cited as an agricultural marvel by such commentators as Holmes and Greenleaf, Aroostook was a special case for the Experiment Station and the College of Agriculture. These institutions upheld grandiose ideal that Aroostook was the Agricultural savior of Maine, and that its industrial development needed scientific and technical support. As a result, Aroostook county had its own experimental farm, and dominated the bibliography of Experiment Station bulletins (Smith 1985, 173-200). It is only in the context of industrial development and grand architectures of industrial development that we can view agricultural science's and education's movement from the fields to the laboratory.

Agricultural Science and Education in the 1850s

Clarence Day describes four chief sources of agricultural education that were available to farmers in the days before the Maine College of Agriculture and the Mechanic Arts was founded in 1867. First, farmers could read articles in such agricultural papers written and printed in Maine as Ezekiel Holmes' Maine Farmer. While this paper was quite prolific within the culture of educated agricultural professionals, often the yeoman farmer had neither the currency nor the literacy to deal with such publications. In

some remote areas, regular mail service was not an absolute guarantee, and thus a paper subscription would seem impractical.

Second, they could attend meetings of local agricultural societies. Maine farmers have had a long and fruitful relationship with agricultural societies. These organizations drew their membership from all walks of society, joining the rural farmer with the prominent tradesman or the agricultural experimenter. Most societies covered an entire county, however a few, such as the North Aroostook Agricultural and Horticultural Society, covered a region of a county. Maine farmers founded New England's first agricultural society, the Kennebec Agricultural Society, in 1787. By 1870 Maine held eight county societies and twenty-six town agricultural clubs (Sherman, 49-50). The societies were subordinate to three major agricultural institutions: the Maine Agricultural Society, the Maine Horse Association, and the Maine Pomological Society. All of these groups collected statistics, performed field experiments and held fairs. At meetings, members would share agricultural techniques and would sometimes read papers from prominent agricultural scientists such as Dr. Holmes. More importantly, the agricultural societies enabled people to get together and talk farming, creating a spirit of mutual interest.

Delegates from each of these societies, including the three statewide associations comprised the Maine Board of Agriculture, which met annually and published its findings annually in the journal, Agriculture of Maine. While this board exerted some control over the local societies, for all practical purposes they remained fairly autonomous.

However, the most important function of the agricultural society, and the third source of agricultural science and education, was the agricultural fair. The Somerset Agricultural Society held the first fair in Maine in 1819. In 1832, the state legislature passed a law providing a $300 matching stipend for agricultural societies. While this fund was not specifically earmarked for fairs (the grant did not stipulate a specific end for the funds), the societies used it towards these agricultural gatherings. After the passage of this law, fairs became the commonplace of agricultural societies. The fair was significant in many respects. It gathered farmers in sparsely populated locations, often with different degrees of literacy to discuss their trade (Day 1963, 180).

Fair organizers awarded premiums for prizewinning livestock and crops. A fertile ground for the exchange of ideas, fairs allowed farmers to feature new crop varieties and machines. The fair was certainly recreational, yet it had a significant educational value as well. In the annual report of the Board of Agriculture for 1870, future Grange Master Daniel H. Thing described the value of agricultural organizations and fairs:

> When a large number of individuals combine together for the purpose of accomplishing a certain object, there are just as many minds at work and just as many intellects laboring for the same object as there are individuals in the association, and among persevering, progressive men, there is always a noble contention or rather emulation to excel, which is continually spurring them on to greater exertions. Again, it is essential in order to make the greatest improvement, that these associations come together and compare notes and products, that they may know who excels in any calling or department, or in regard to any particular animal or article, and how they do if; whether by chance or by intelligent experiment (Maine Board of Agriculture 1870, 7).

Nowhere else could farmers from sparsely populated areas gather to exchange information. Additionally, the fair provided a means of education for illiterate farmers who did not subscribe to farm journals. Furthermore, the fair and the agricultural society provided an egalitarian setting to compare ideas and spurred healthy competition for

better methods. In this collective setting, nascent agricultural science occurred at the interface between these various farmers.

The fourth means of education came in the form of local agricultural clubs. According to Day, the first farmer's club in Maine arose in Bethel in 1853 (Day 1963, 10). Like the fair, the local club was a great aid to illiterate or otherwise hindered local farmers. "Some [clubs] established small libraries and encouraged the reading of books. Some … owned their own fairgrounds" (Day 1963, 182-3). While associated with the larger county societies, "each was administered on a local basis and not as the subordinate unit in some larger county or state club" (Sherman, 51) Many of these local groups were the only means of agricultural support; scientific, educational, social or otherwise, available to farmers in the early to mid 19th century, especially in areas as remote as Aroostook. In Agriculture of Maine, 1870, Hon. Simon Brown, of Concord, MA, delivered an address on the value of farmer's clubs as educational institutions. Brown wrote,

> The farmer, too, has become inquisitive and inspired. He is not satisfied now with turning up the furrows of the field because it makes hoeing easier, but asks, 'What action is going on in these clods? What are the rain and frost doing there? What office does this sand and these pebbles perform? How came from the bone found in the garden a complete net-work of roots? Why was the wheat crop where lime was spread three times as much as was ever obtained before? Why have young pines covered the ground where oaks were cut off four years ago?' (Maine Board of Agriculture 1870, 39)

Brown's commentary highlighted the eagerness of farmers to learn and exchange ideas about farming techniques and a scientific explanation of local ecology. The farmers' club, agricultural society, and fair proved to be the best forums for this exchange. The mere practice of farming no longer satisfied the yeoman. His curiosity demanded further explanation for the natural processes so acquainted with his profession.

As early as 1846, the County benefited from the local farming clubs and agricultural fairs. In that year Houlton farmers established the Aroostook County Agricultural Society. This society originally held the fair that would become the Northern Maine Fair, which successfully congregated otherwise isolated farmers to share varying methods, and provided fertile ground for both crops and new agricultural ideas. The Aroostook County Agricultural Society predated the North Aroostook Agricultural and Horticultural society, of Presque Isle, by four years. In 1850, after the establishment of the Presque Isle society, the Northern Maine Fair's predecessor migrated north to Presque Isle from Houlton. As I have already related, the fair of the North Aroostook Agricultural and Horticultural Society for the year of 1858 was covered by numerous journalists from across the state.[6] Their reviews of the fair were stunning. Dr. W. B. Lapham, of the Oxford Democrat, wrote, "The Cattle Show and Fair of the North Aroostook Agricultural Society came off on the 6th and 7th inst. [sic.]. The weather was fine and the number in attendance large. I came to the conclusion that Aroostook was a good place to raise men if nothing else" (Steinhauer, 98). Lapham's account, and the fact that so many editors made the arduous trek up to Aroostook for the fair, is testament to how important this event must have been for the local farmers.

The early success of the Aroostook fair was mirrored throughout the state. In addition to the fair, the local farm club was also a very successful agricultural education institution. By 1860 there were twenty active clubs in all of Maine. Meetings were confined to members' houses, local meeting houses or schools. Membership tended to cross socioeconomic stratifications. Some clubs "often included the doctor, lawyer, minister, and other people from the nearby village as well as farm people" (Day, 181-2).

[6] See p. 43 above

Membership fees varied from club to club, as did resources such as libraries, exhibits and fairgrounds. Members could be expected to prepare talks, while all were expected to engage in discussions. Clubs sometimes even engaged in neighborhood restorations.

The farm club, county fair, and agricultural society formed a network of agricultural science and education that predated organized and institutionalized attempts at educational extension and scientific experimentation. These four groups constituted a nascent network of education and science that was anti-institutional, egalitarian, and whose members were directly involved with the actual practice of farming. The significance of this proto-institutional system cannot be understated. Farmers in sparsely populated areas with limited literacy could gather at a fair, club, or society, and exchange techniques or information. This information flowed from the ground up, or perhaps from the ground out, as the direction "up" implies a hierarchy that for the most part was not present, whereas "out" denotes a web of individuals and institutions all at a common level of control.

At this point, there was a subtle distinction between agricultural science and agricultural education, a distinction that evolved as both fields became more professionalized and institutionalized throughout the nineteenth century. For the most part in the 1850s, however, the institutions that engaged with one, almost always engaged with the other. Those agricultural societies, fairs, and clubs that disseminated the accepted body of agricultural science, also engaged at that science's frontier. From a paradigmatic perspective, there was no consensus of normal science, and thus no distinction between the canonical body of knowledge and the groundbreaking body of

knowledge. Each participant in the fair, the club, or the society was both an agricultural student, as well as an agricultural scientist.

Yet by the close of the Civil War this network was in decline. This was in part because many members of agricultural clubs died in the Civil War. This was also in part due to the continuing trend of western emigration from New England farming populations. Historians Clarence Day, Rexford Sherman, and Samuel C. Guptill, however, cite the onset of the Grange as reason for the decline of the farm club.

The Grange

The Grange, or more accurately the political movements associated with the Patrons of Husbandry, according to Solon Justus Buck's The Granger Movement: A Study of Agricultural Organization and its Political, Economic and Social Manifestations, 1870-1880 (1963), was in part a consequence of anti-Republican sentiments of some disenfranchised southern and western farmers, many of whom Democrats, Populists, Greenbacks, or members of other left wing political parties, and was in part the result of a movement to enact an organized system of agricultural education and aid. Founder Oliver Hudson Kelly traveled throughout the south after the Civil War, under the employ of the Department of Agriculture, to assess the state of its rural population. This region had been so devastated by the Civil War, and by subsequent reconstruction policies that, moved by sympathy for the farmer's plight, Kelly endeavored to establish a fraternal order to aid practitioners of agriculture. In 1867 he founded the "Patrons of Husbandry." This organization, loosely based on Masonic tradition, was a national organization of lodges, the primary goal of which was the betterment and aid of rural farmers.

Afterwards, Kelly traveled through the northern states establishing lodges as he went. The Grange was originally designed to spread agricultural knowledge and farm management techniques to rural farmers, however, from its point of inception the Grange was a farm lobby. Many western and southern farmers felt disenfranchised by oppressive railroad monopolies and large business interests – which were often aligned with Republicanism in the late nineteenth century. The chief task of Grangers became fighting the monopoly power of the railroads.

In the mid nineteenth century, railroad prospectors and industrial advocates promised fair transportation rates, diminished cost of freight, and access to burgeoning and distant markets to farmers in exchange for political support. Industrial proponents claimed that farmers should not fear the high tariffs associated with manufacturing costs. The profit garnered by such tariffs would be spent towards internal improvements, decreasing the transportation overhead and thus reducing freight rates. Additionally, railroad supporters argued that the improved transportation would increase access to domestic markets and reduce the cost of imported materials from eastern manufacturers. Swaying the farmers was (and remains) an important political strategy. “Over half the voting population was made up of rural land owners, so that their power at the ballot box was decisive in the country’s politics” (McCabe, 6). Harnessing the political power of the rural population became an imperative political move, and thus Republican pundits, whose interests generally lay with industrial and financial ends, began emphasizing a mutually beneficial relationship between the farmer and the capitalist. A vote for a Republican (essentially a vote for railroads, financial institutions, and industry) was good for the farmer.

Unfortunately, after their ascent to power in the 1860 election, Republican politicians and their industrial growth policies did not produce the benefits promised to farmers. Trusts suppressed competition, fixing prices at unfair levels. Transportation costs also exceeded the initial claims, as railroad monopolies fixed prices at the highest level endurable by the market. This effectively swallowed up the returns farmers had so eagerly expected. A combination of overproduced crops and exorbitant freight and goods prices effectively reduced the farmer to the level of an underpaid laborer. Furthermore, the Civil War left the former Confederate states in shambles. Poor, rural farmers took much of the brunt of this devastation. This exacerbated already polarized political lines cast by the Civil War between a Republican North and a Democratic South. It is in this economic context that we must view the rise of the Grange and its subsequent political actions.

National Grange associations dreamt of a mass crop withholding, a tactic analogous to a labor strike. The Grange was successful in forcing the passage og some legislation in crucial western states to control freight rates and grain-elevator storage rates. The constitutionality of these “Granger Laws” was upheld in a series of 1877 Supreme Court decisions. Additional laws were passed after the success of the first Granger laws, and in 1887 the Interstate Commerce Commission was formed to regulate transportation rates. This was a bittersweet victory for the Grangers. All ICC decisions were vulnerable to contest by railroad interests. This effectively entangled restrictions in lengthy appeals that eventually favored the railroad industry. The Patrons of Husbandry, however, were successful in establishing the Secretary of Agriculture as a cabinet position, which guaranteed that the farmers’ would have a voice in the President’s ear.

The Grange in Maine, like many New England lodges, however, was less of a forum for economic and political warfare than in its western counterparts. Historian Dennis Nordin in his article, "A Revisionist Interpretation of the Patrons of Husbandry, 1867-1900," argues that there were two distinct grange movements. The first being the western Granges who engaged whole heartedly in left wing anti-industrial politics. It is from this movement that our received history of the Grange politics and the legacy of the granger laws come. Yet this phenomenon did not extend to the eastern seaboard, where Nordin's second Grange movement occurred. Nordin states that contrary to the popular history of the politics of the Grange, eastern lodges did not engage in anti-railroad or business actions. Their main charge was adult agricultural education (Nordin, 631).

In 1877, the Maine Grange organized the Patrons' Cooperative Corporation in Portland. The corporation sold wholesale groceries, grain, provisions and farm supplies. Cooperative enterprises in Maine may have been unsuccessful, as this is reported by Florence J. Foster in the *Annals of the American Academy of Political and Social Science*, Vol. 4. (Mar., 1894), pp. 108. "Maine furnishes no definite reports, and we may conclude that cooperative enterprises have little vitality there." Nelson Ham, the Maine Grange's first State Master supported cooperative stores to provide fairly priced goods for farmers, helped initiate fire and life insurance programs. Under the leadership of Daniel H. Thing, Ham's successor, the Grange advocated standardized texts and schooling practices. Thing also pursued a more liberal appropriation for the Maine State College.

While the Maine Grange was not as much of a political institution as western Granges, it did champion local agriculture and farmers' support through its interests in

textbook standardization, appropriations for the Maine College, local cooperative stores, and insurance programs. George C. Collins described the Aroostook Grange as:

> "…a strong institution, conducted in harmony with the best interests of the farming class, and an indispensable agency in raising the standard of intelligence, culture and refinement among the farmers and their families in our County" (Collins, 93-4).

The Aroostook Pomona Grange[7] had one of the most successful cooperative stores. "The Houlton Grange store, of which [Albert G.] Merritt was then [1918] manager, was (and still is [1963]) the most successful cooperative business measure by a subordinate Grange." The Aroostook Grange's success was atypical, as most local attempts at cooperation failed. Cooperatives lacked sufficient capital to buy collectively and many members shied away from investing even the smallest of sums of money. Grand notions of a centralized network of cooperative stores that could not only aid farmers but help to control agricultural markets failed due to slim support. The Aroostook Pomona Grange sponsored the first cooperative organizations in the county. Elisha E. Parkhurst acquired the business, a fact which is only referenced in an 1888 issue of the Portland Transcript as the Northern Aroostook Potato Growers Association. Potatoes sold through the cooperative were marked with a seal from the Aroostook Pomona Grange to ensure quality. Day notes that the cooperative unfortunately failed due to disagreements amongst its members and unfit cooperative methods (Day, 149). Indeed, by the end of the 1880s and the beginning of the '90s, the Grange in Maine had lost much of it's initial momentum.

Then how did this brief movement overturn the entire system of agricultural education? This shift is due to three chief causes. First, the decline of the farm club and the rise of the Grange, with its strong concerns about agricultural education, coincided

[7] County or other local granges were often referred to as "Pomona Granges."

with a growing trend of professionalizing within agricultural science. In 1883, the Maine Legislature established an agricultural experiment station. Second, the growth of the Grange occurred alongside of the increasing influence and capabilities of the Maine College of Agriculture and the Mechanic Arts, which later became the University of Maine. This land grant college, established under the Morrill Act of 1867, sought to provide standardized and institutionalized education to the Maine farmer. Yet neither of these two establishments alone hold complete agency over this dramatic shift. This brings us to our third cause, the leadership of Grange master and State Governor Frederick R. Robie, whose immense political support of the Grange and the College cannot be understated. Furthermore, Robie was instrumental in the establishment of the Experiment Station.

Frederick Robie, State Master Thing's successor, was far from an ideal left wing agriculturalist.[8] Robie was a physician by trade and had a heavy hand in business interests. "Robie stands out as a paradoxical agricultural leader for his primary personal interests were political and business" (Guptill, 43). Robie was head of the First National Bank of Portland, which at the time was the largest bank in Maine, the Portland and Rochester Railroad Company, the Eastern Telegraph Company, the Union Mutual Life Insurance Company, and for a time served as the business manager for the Portland Press Publishing Company. Given Robie's strong history with large business interests, it seems odd that he would become an immensely influential Grange Master, whose leadership, according to Simon Guptill, "helped the order grow until Maine became the banner grange state" (Guptill, 41). Yet we must not forget Nordin's points about the

[8] Daniel Thing was an 1882 candidate for Congress under the Greenback Party. Both the Populists and the Greenbacks were associated with Grange movements of the late 19th century, and were generally aligned with left wing policies to aid farmers.

dichotomous nature of eastern and western granges, and that the eastern movement was not nearly as critical of traditional Republican institutions as was its western counterpart.

State Master Robie served from 1881 to 1889. During his tenure as a Grange leader, Robie was also the Governor of Maine from 1883-1887, which put him in a unique political position to advance the Grange agenda. Robie was instrumental in appropriating funds for the experiment station's establishment. Under his leadership the State Grange nearly doubled in membership. Aside from her educational advancements, the Grange also successfully insured many farmers with life and fire policies. Robie sent "missionaries" to organize subordinate Granges in order to curtail a rising trend of ineffectively managed lodges. Robie chaired the various national grange committees, and through his influence at the national level helped garner support for the Hatch Act of 1887 that provided federal support for experiment stations. Robie's support of scientific agriculture and standardized education was also strong at home, as many of his endeavors as Governor and grange master directly benefited the experiment station and the college of agriculture. Effectively, under the tenure of Robie, the Grange, accompanied by the experiment station and the college of agriculture, supplanted the farm club and fair network.

Accompanying this change was the rise of industrialization on the farm, as we have previously seen. While the traditional historical narrative of the Grange stresses radical political ideas and the culmination of farmers' discontent in the mid 19th century, the Maine Grange stands apart from this trend. It seems as if the only commonality between these two disparate groups, the Maine Grangers and the western Grangers, was the shared enthusiasm for agricultural education and cooperatives. Agricultural

education, however, is not valueless, and we should be reticent to write off the history of agricultural education as that of logical progress. The decline of the local agricultural club, while in many ways attributed to the Civil War and the rise of the Grange, may represent the greater loss of other means of education.

In concordance with the rise of professionalism in science in the late 19th century, agricultural education became a professional affair. This entailed a top down structure to scientific dissemination. Agricultural science would be performed in the laboratory by professional scientists. These were often not farmers themselves, or at best gentlemen farmers. This new educational structure supplanted the traditional model supported by the agricultural fair or club. The local society served as a meeting place for farmers, who could then exchange information about what worked, and what failed. While this does not conform to a contemporary model of a scientific institution, the trial and error process was similar to that performed by agricultural scientists. Thus, the only real changes in the system were that those of higher social status now performed the experiments with greater budget and facilities available.

Agricultural education for the Grange was institutionalized and standardized, implying bureaucratic control of the process. As is seen with the experiment station, which was linked to the Grange through Robie, this type of education and outreach is very much grounded in the ides of western scientific thought, that scientific societies given bountiful funding will produce practical, unbiased and universally true results to inform the masses.

Farm clubs exemplified contrarian educational tradition of sustaining local knowledge. For instance, local clubs and agricultural fairs provided educational means to

members of varying literacy, which was especially significant in remote regions such as Aroostook. Both the Grange and local clubs may have employed similar methodologies. Also, there may have been strong intellectual interplay between the two groups. That the Grange movement supplanted local clubs represents a transition towards the supremacy of bureaucratic and institutional science over local. This transition should not be interpreted outside of the realm of socioeconomic classes. Robie, a key advocate for the Grange and the Experiment Station, had deep interests in both banking and railroading. His interests in the Maine Experiment Station cannot be divorced from his political leanings.

The Maine Agricultural Experiment Station is best viewed in the context of increasing professionalism and institutionalism of science within the 19th century. Indeed, prominent figures in the history of Maine's agriculture, such as Dr. Ezekiel Holmes, its first professor of Agriculture, had advocated for an institutional marriage of science and farming since his early days at the Maine Farmer. In 1822, Robert Hallowell Gardiner incorporated the Gardiner Lyceum, the nation's first agricultural school, in Maine.

The idea of an experimental farm is a Baconian dream[9]. Experiment station scientists, under state patronage, may test out new crop varieties, employ different means of planting, cultivation and fertilizing, and disseminate their results to the willing masses. There is an explicit hierarchy of knowledge at work here. As Station director (for an

[9] In his book, The New Atlantis, philosopher Francis Bacon describes an ideal society in which scientists are given absolute power. Enabled by unwavering financial and political support, these technocrats would devote their lives to the perfection of society through the means of rational science. By cloistering themselves from the distractions of society, learned men could be free to decipher the mysteries of nature. Once *her* mysteries were unraveled, scientists would know the one best way to run society. Bacon's treatise is very similar to modern state supported ventures such as experimentally run farming.

impressive span from 1896-1921) Charles Dayton Woods wrote in the 1916 History of the Maine State College and the University of Maine:

> It is difficult to realize at this day that only forty years ago the body of agricultural *truth* that is now so well established was so far from a *fact* [emphasis is mine] that a professor of agriculture in his annual report could truthfully say that there were no text-books on the subjects which he was expected to teach and that "information could only be gathered here and there, from books and papers, from my own experience and that of others, as opportunity offered." (Fernald 269)

Woods's use of the terms "truth" and "fact" contain engendered values about the nature of science, and the role of the scientist. His conception scientific knowledge is that which is only verified institutionally and officially published. While scientific truths should be verified and published, as to promote peer review and pluralist discourse, we should not hold them paramount over local truths. The Experiment Station's mandate was (and is) to provide scientific guidance for farmers, which ensure the dissemination of information flows from the institutional lab to the masses. Establishing an institution like this, which while published its records free of charge to anyone who requested them, places scientific establishments upon a pedestal of authority, and conversely downgrades any other form of agricultural education. Whether or not Station managers explicitly devalued the information of prior agricultural clubs, their implicit biases about the scientific authority of the institution versus the club or fair imply a bias about who is qualified to perform science.

The key difference between the experiment station model of agricultural education, and that at the essence of the club and fair model is that the latter operates through bureaucratic institutions staffed by professional scientists. The experiment station held model farms throughout the state. This archetypal tract was not only a demonstration tool; it also served to abstract an entire region. Under bureaucratic management, the

ideals of farming became numeric. As the scientific side of agricultural education became more professionalized, universalized, and quantitative, so then did the ideals of farming change. The new goals were volume of production as best achieved through modern scientific means.

The club and fair model, while in some ways similar, differs the most in it's institutional structure. Whereas in the experiment station model, scientific knowledge disseminates in a top-down fashion, the club and the fair provide an exchange of information on an equal footing. The goals of production are not bureaucratically set, and instead are the choices of the individual farmer. While competition is one means by which fairs assign arbitrary goals, the competition itself is a strong forum for educational exchange, and provides a very public display of what works, and what doesn't.

The Maine Grange, through the auspices of state agriculture services and the Maine Agricultural Experiment Station propagated a system of agricultural education informed by western scientific method and industrial ideals. The farm was no longer the direct means of sustenance for a family or community, and no longer represented a home amongst nature. Several key themes arose from state augmented agriculture that defined the new farm. First is the theme of the industrial farm. Efficiency became the new dogma of agriculture. The farm became more mechanized and specialized, shifting from hay, oats, and rye to potatoes. To best inform this new efficient and modern farm, the state provided scientific and bureaucratic support. This leads us to the second theme, the experimental farm. While for the new industrious farmer, land became a resource to be most efficiently utilized, for the scientist the farm was a laboratory. On an experimental

plot, the agricultural scientist could test out new planting patterns, new fertilizer mixes and new machinery.

The shift towards a professional, scientific, and bureaucratic institution to disseminate knowledge accompanies, and in many reinforces the transition to industrial farming. Since many industrial agricultural technologies, such as chemical fertilizers, are the direct result of agricultural science organizations, there is an obvious link between the technological changes in the field, and the changes in the classroom, and an even more important link between the changes in agricultural science and the rise of rural industrial capitalism.

Conclusion:

The Rise of Rural Capitalism, Industrial Farming, and the Modern Agricultural Crisis:

Agriculture is perhaps the mode of interaction with nature, despite the fact that it operates within the realm of human artifice, that is most familiar to us. Consequently, the mode in which we reap our plenty carries with it value judgments about the natural world. As I have tried to show in chapter 1, farmers in the mid nineteenth century were caught in a dilemma between two modes of agriculture – the "self-sufficiency model and the market capitalist model. Each of these modes carried engendered values about the natural world. "Self sufficiency" farming endorsed social and familial relationships over profit as a motive for production, and thus fostered a nascent environmentalism amongst farmers. Market (or industrial) capitalist farming did exactly the opposite, commodifying nature to a resource and abstracting farmers' perspectives on the natural world. While this may not have been apparent to every farmer in the mid-nineteenth century, from a historical perspective it is clear that the rise of industrialism and capitalism on the farm accompanied a decline of environmental and social concerns. Historian Deborah Fitzgerald, in her book Every Farm a Factory: The Industrial Ideal in American Agriculture, points to this shift, labeling it a change in the "logic of production," such that the factory became the ideal for American agriculture, as the root for our contemporary agricultural crisis.

This is not a controversial point, as it seems as if the American farmer has become like Charlie Chaplin in Modern Times, caught in the wheels of some technological behemoth. Perhaps a contemporary example will best explain the situation.

In 1998, the Wisconsin State Legislature (WSL) voted to ban dairy product labels that advertised the absence of rBGH (recombinant Bovine Growth Hormone, also known as Bovine Somatotropin. rBGH is a supplement hormone injected in dairy cows to increase their milk production). Legislators claimed that such advertisement played on the irrational fears of consumers over the hormone's safety. Recombinant BGH was first developed by scientists at Genentech and Monsanto corporations in 1979. The hormone, which potentially augments milk production by up to 20%, was met with public alarm. Consumers held deep concerns over the threat to human and animal health, as well as the welfare of small scale Wisconsin dairy farmers, whose income and very way of life were threatened by this new technology. The 1998 act marks a decade long reversal of the position of the legislature. At the onset of the hormone in 1990, the WSL placed a temporary moratorium on rBGH usage pending a one year trial period. Indeed, within an eight year period, the safety of a potentially hazardous and morally reprehensible technology was taken for granted, and the very mention of its deleterious effects became an illegal advertisement.

This snapshot example highlights the increasingly committed marriage between western technoscientific tradition and agricultural practice, which does not always proceed as a boon to the farmer. Indeed, in terms of many technological revolutions, it seems as if the farmer has gotten the short end of every stick. This union has led to a number of cases of agricultural depression, which have been crudely written off by technological and economic apologists as the necessary consequences of progress. Increased agricultural production from technological and organizational changes

precipitated a wave of farm foreclosures and depressions within rural communities in the 1980s.

There are many other examples of how scientific and technological changes that aim to increase output on the farm, and subsequently hurt the farmers' standings, bovine growth hormone is just a recent iteration in a legacy of industrial oppression of rural populations.

In the last chapter of his book, The Botany of Desire, author Michael Pollan discusses how a genetically engineered potato, the NewLeaf brand from the Monsanto Chemical Corporation, can come to symbolize control over nature. The NewLeaf is designed to secrete it's own pesticides, and thus poses an environmental problem should this technology get out of hand. But more importantly, it represents a continuation and culmination of the tendency of industrial agriculture to not only suppress environmental sentiments, but to also to suppress a system of local agriculture that fosters community relationships and ecological consciousness.

Perhaps then we may view the Maine potato, and the story if its ascent to prominence as a metaphor for an increased control on nature, and an increased move away from social structures. The rhetorical framework was laid out for by state surveys that myopically abstracted the natural world, railroads and mechanizations that characterized nature as a resource only, and by the growth of a scientific system that endorsed industrialism as its focus. Moreover, specific institutions, practices and technologies worked towards these ends outside of their rhetoric, actually asserting agency. This phenomenon recalls the work of Langdon Winner. In his book, The Whale

and the Reactor: A Search for Limits in an Age of High Technology, Winner wrote on the political significance of artifacts,

> There are, however, good reasons to believe that technology is politically significant in its own right, good reasons why the standard models of social science only go so far in accounting for what is most interesting and troublesome about the subject. Much of modern social and political thought contains recurring statements of what can be called a theory of technological politics, and odd mongrel of notions often crossbred with orthodox liberal, conservative, and socialist philosophies. The theory of technological politics draws attention to the momentum of large-scale sociotechnical systems, to the response of modern societies to certain technological imperatives, and to the ways human ends are powerfully transformed as they are adapted to technical means. … Rather than insist that we immediately reduce everything to the interplay of social forces, the theory of technological politics suggests that we pay attention to the characteristics of technical objects and to the meaning of those characteristics. A necessary complement to, rather than a replacement for, theories of social determination of technology, this approach identifies certain technologies as political phenomena in their own right. It points us back, to borrow Edmund Husserl's philosophical injunction, *to the things themselves* (Winner, 21-2, emphasis in the original).

Winner urged us to recognize that our relationship with technology is a two-way street. We are not hopelessly determined by our technologies, however artifacts do retain a certain degree of political influence, and we must recognize this in choosing whether to adopt a technosocial system or not. Perhaps then, the solution to the ecological and social problems that constitute our agricultural crisis is merely about choosing not to participate in its industrial and capitalistic ends, but to find a reconciliation between our production needs, and our moral concerns.

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