The Wealth and Well-Being of Nations • Joel Mokyr

The Annual Proceedings of

The Wealth and Well-Being of Nations

2023-2024

Volume XV: Culture, Institutions and the Wealth and Well-Being of Nations

Joel Mokyr

Laura Grube, Editor

2023-2024 • Volume XV

The Miller Upton Program at Beloit College

The Wealth and Well-Being of Nations was established to honor Miller Upton, Beloit College's sixth president. This annual forum provides our students and the wider community the opportunity to engage with some of the leading intellectual figures of our time. The forum is complemented by a suite of programs that enhance student and faculty engagement in the ideas and institutions that lay at the foundation of free and prosperous societies.

Senior Seminar on The Wealth and Well-Being of Nations:

Each year, seniors in the Department of Economics & Business participate in a semester-long course that is built around the ideas and influence of that year's Upton Scholar. By the time the Upton Scholar arrives in October, students will have read several of his or her books and research by other scholars that has been influenced by these writings. This advanced preparation provides students the rare opportunity to engage with a leading intellectual figure on a substantive and scholarly level.

Endowed Student Internship Awards:

A portion of the Miller Upton Memorial Endowments supports exceptional students pursuing high-impact internship experiences. Students are encouraged to pursue internships with for-profit firms and non-profit research organizations dedicated to advancing the wealth and well-being of nations.

Student Research Colloquium and Speaker Series:

The department has initiated a research colloquium that gives students the opportunity to read and discuss seminal articles aimed at deepening their understanding of the market process. Students also develop original analysis that applies economic ideas to novel contexts. Colloquium participants receive close mentoring as they craft an article with the eventual goal of publication in a newspaper, magazine, or academic journal. The themes of the research colloquium and annual forum are supported with a speaker series featuring the next generation of scholars working on questions central to our understanding of the nature and causes of wealth and well-being.

Annual Proceedings of The Wealth and Well-Being of Nations:

The keynote address presented by the Upton Scholar is an important contribution to the public discourse on the nature and causes of wealth and well-being. Further, the annual forum includes presentations by noted scholars who expand upon or challenge the work of the Upton Scholar. These presentations are assembled in the *Annual Proceedings of the Wealth and Well-Being of Nations*, which serves as an important intellectual resource for students, alumni, and leaders within higher education.

The Annual Proceedings of the Wealth and Well-Being of Nations

2023-2024

Volume XV

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Editor

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Introduction

Laura Grube[1]

As the Elbert Neese Professor of Economics, it is my honor and privilege to introduce the fifteenth *Annual Proceedings of the Wealth and Well-Being of Nations.*

Under the banner of the Miller Upton Programs, the Department of Economics and Business at Beloit College has developed an ambitious initiative to advance understanding of the ideas and institutions necessary for widespread prosperity and human development. The centerpiece of these programs is the annual Wealth and Well-Being of Nations: a Forum in Honor of Miller Upton, an economist by training and the sixth President of Beloit College (1954-1975). Every year, the Upton Forum brings to Beloit College a distinguished, internationally recognized scholar who works within the classical liberal tradition. The Upton Scholar engages with students, faculty, alumni, and civic leaders in an informed dialogue around the nature and causes of wealth and well-being.

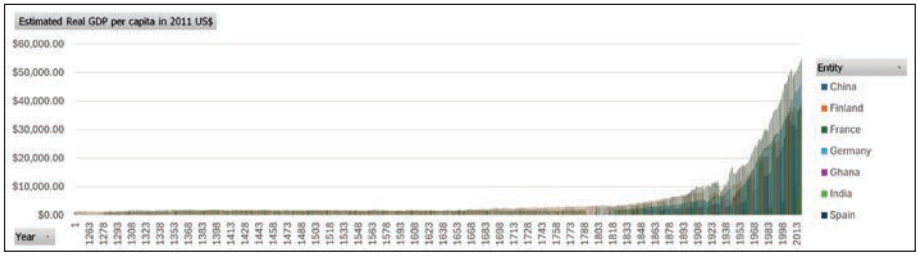
I am delighted to lead the Upton Forum and related programs on this milestone of its fifteenth year. During those fifteen years, we have welcomed three Nobel Memorial Prize winners in economics, including the first woman to win the Nobel Memorial Prize in economics, Elinor Ostrom (2011/12). Our Upton Scholars have explored the institutions that support a market economy (Douglass North 2008/9, Hernando de Soto 2009/10, and James Gwartney 2013/14), as well as the factors that prevent economic growth (Timur Kuran 2012/13). More recently, we have focused on topics that present ongoing debates, such as how do we address climate change and future energy needs? (Robert Stavins 2014/15, Michael Greenstone 2017/18) How can we understand the effects of globalization (Dani Rodrik 2018/19) and international migration (Giovanni Peri 2021/22) in the 21st century?

1 Laura Grube is the Elbert H. Neese, Jr. Professsor of Economics at Beloit College.

In addition to the Upton Scholar, the Forum features leading scholars whose work complements the work of that year's Upton Scholar. This cadre of scholars is assembled to further reinforce that the intellectual enterprise of understanding the nature and causes of wealth and well-being is an ongoing project. The essays collected in this volume capture in written form many of the ideas exchanged, challenges posed, and questions considered during the Upton Forum and over the course of the academic year.

Upton Scholar Joel Mokyr and the Big Questions

Our Upton Scholar this year is Joel Mokyr, the Robert H. Strotz Professor of Arts and Sciences and Professor of Economics and History at Northwestern University. Mokyr has dedicated his career to the big questions related to wealth and well-being. His research program could be described as answering the question, what is the cause of modern economic growth? For most of human history, people – in every corner of the world – were poor. Time series data of real gross domestic product (GDP) per capita, beginning in the year of Christ's birth and up to the present day, is described as a "hockey stick." From the year 1 CE up until approximately 1820 there was little, or no increase in real GDP per capita. Then just after the turn of the 19th century, there is an increase and an exponential increase.[2]



To put this in perspective, before the 19th century, the wealthiest parts of the world lived on $4 a day and for most of world history, $2-3 day was the average (in 2011 USD, Koyama and Rubin 2022: 6). Life expectancy at birth is another indicator of wealth and well-being. A time series graph of life expectancy at birth shows a similar pattern, although the increase comes later, closer to 1860 or 1870.[3]

2 This data is available from: https://ourworldindata.org/grapher/historys-hockey-stick-worldwide-historical-real-gross-domestic-product-per-capita-finn

3 This data is available from: https://ourworldindata.org/grapher/life-expectancy

Mokyr has explored this big question of how modern economic growth came about by focusing on technological change and the British Industrial Revolution (1760-1840). However, this begs the question, what led to the British Industrial Revolution? Mokyr's research has explored why the British Industrial Revolution took place *where* it did and *when* it did.

Within the field of economic history, Abramitzky (2015) has characterized various research approaches, including what he refers to as " 'big think' economic history." Mokyr's "big think economic history" or engagement with the big questions, is well-suited for the Upton Forum and Beloit College for a few reasons. First, the big question of "what are the causes of modern economic growth?" encourages critical thinking in students. Students are asked to consider their own knowledge on what causes economic growth and to present, compare, and interrogate various hypotheses in the literature. Students investigate what are the underlying assumptions of each argument? What is the theory and logic of the argument, and how does it relate to other arguments? What evidence is presented, and how is that evidence analyzed? The literature on the causes of modern economic growth is expansive, with competing hypotheses related to geography, institutions, culture, and demographics.[4] Exposure to diverse perspectives and counter-arguments on the big questions allow the student to question what is otherwise not questioned. This ability to interrogate one's own knowledge and navigate competing views is among the most emancipating elements of a liberal education (Chamlee-Wright et al. 2017: 38).[5]

Second, the study of economic history and the big questions in economic history especially, are not monocausal and cannot be fully understood by one disciplinary perspective. Instead, a breadth of knowledge, consistent with a liberal arts education, is necessary. As Mokyr (2003) has explained, "[Economic history] stands at a busy intersection of history and the social sciences, where economists, political scientists, sociologists, anthropologists, demographers, and historians come and go." Mokyr has studied many different disciplines to consider the causes of modern economic growth. In order to understand technology and technological

4 Koyama and Rubin's 2022 *How the World Became Rich The Historical Origins of Economic Growth* provides a helpful summary of the most important arguments in the literature. The text was used in the senior seminar course in fall 2023.

5 Interested readers are encouraged to read Chamlee-Wright, Hall and Grube (2017) as it presents the Upton Programs at Beloit College and the learning goals. Also referenced in Chamlee-Wright, Hall, and Grube (2017) is Kronman (2007) and Colander and McGoldrick (2009) who discuss the importance of big questions as teaching questions.

change at different times in history, Mokyr (1990) has had to become familiar with concepts in mechanical engineering to consider the changing designs of waterwheels, the shift in a basic horse harness, and the principles of early steam engines. As part of his exploration of change over time, Mokyr (2016: 28-32) refers to the biological theory of evolution. He teases out seven characteristics of evolutionary theory and explains how these characteristics help us to better understand historical and cultural change. One of the seven characteristics which is a key theme to Mokyr's view of economic history is that, "an evolutionary framework implies that any easy generalizations or predictions about the speed and direction of cultural change are doomed" (ibid.: 31). For some such a claim about uncertainty may be disheartening or frustrating; however, for Mokyr, it reinforces the importance of humility and presents the opportunity for surprise and even, marvel. Through his numerous essays and books, Mokyr demonstrates that he is a student of the liberal arts and that such a breadth of knowledge is required to take on the big questions in (economic) history.

A Culture of Growth: The Origins of the Modern Economy

The British Industrial Revolution was a period of dramatic increase in productivity, brought forth by inventions such as the spinning jenny, steam engine, and electric generators. The inventions spurred further innovation and change in many different sectors: the steam engine became a source of power for factories, agricultural machines, and modes of transportation. The increases in productivity led to greater output which in turn led to increases in wealth and well-being. In *A Culture of Growth* (2016), Mokyr points to aspects *of the culture* in 18th century northwestern Europe which generated an environment conducive to sustained economic growth.

Although the discipline of economics has been somewhat reluctant to consider culture as a variable for analysis, there has been more research on culture in the last two decades. Some of the resistance is driven by a perception that culture is imprecise, or difficult to quantify. Unsurprisingly, economists (and other social scientists) have defined culture in different ways. Some economists have defined culture as trust and shown that societies with higher levels of trust have higher levels of economic growth (Tabellini 2010). Virgil Storr (2013: 3) has suggested a more nuanced view, that culture should be considered as "a historically transmitted pattern of meanings" shared by a group and socially transmitted to other

group members. Studying culture then implies studying history, cultural texts, or engaging in ethnography in order to access the pattern of meanings (ibid.: 95). Deirdre McCloskey's research on culture also relies on narratives, stories, and historical texts. McCloskey's research on economic growth and culture has similarities to Mokyr's – most obviously in that they both are interested to understand what led to the Industrial Revolution.[6] McCloskey (2016) argues that a change in cultural values, especially values that celebrate hard work and risking taking, led to the Great Enrichment (Northwestern Europe's takeoff in the 17th and 18th centuries, leading to the British Industrial Revolution).

Indeed, both McCloskey (ibid.) and Mokyr (2016) argue that changes in culture and ideology are a fundamental cause of modern development. Mokyr adopts his definition of culture from Boyd and Richerson (1985: 2 in ibid.: 8), "culture is a set of beliefs, values, and preferences, capable of affecting behavior, that are socially (not genetically) transmitted and that are shared by some subset of society." The particular change in culture that Mokyr argues was so important is a change in cultural beliefs *about man's relationship to nature and the spread of knowledge in society*.[7]

Mokyr describes the change in cultural beliefs about nature as being that humans can understand the rules of nature and ought to use that knowledge for good – the betterment of mankind. As Mokyr (2016: 14-15) writes, "Technology is above all a consequence of human willingness to investigate, manipulate, and exploit natural phenomena and regularities." Contrast this with metaphysical beliefs (often tied to religious beliefs) that associate manipulating and controlling nature with a sense of fear or guilt (ibid.: 17). In order to illustrate the change in cultural beliefs and demonstrate how such change takes place, Mokyr introduces "cultural entrepreneurs," including Francis Bacon (1561-1626) and Isaac Newton (1642-1727).[8] Bacon, although not himself a scientist nor inventor, pushed scientific

6 In particular, her Bourgeois Trilogy, *The Bourgeois Virtues: Ethics for an Age of Commerce* (2006), *Bourgeois Dignity: Why Economics Can't Explain the Modern World* (2010), and *Bourgeois Equality: How Ideas, not Capital or Institutions, Enriched the World* (2016).

7 Spolaore provides a helpful book review, versions available both in the Journal of Economic Literature and NBER.

8 Newton played an important role as well. Newton of course was a great scientist and mathematician. Mokyr writes, "By his own admission, he made his Principia abstruse, so as to be understood only by 'able mathematicians' who would 'concurr with him in his Theory.'… If Newton as a cultural entrepreneur had an effect on the Industrial Revolution, it was through his impact in changing the fundamental values and beliefs of a select group of elite agents in Enlightenment society" (ibid.: 99-100). And, "His work filled other scholars with hope that such areas as farming, medicine, chemistry, electricity, materials, and even

thought through what Mokyr refers to as the "Baconian program,"

> Up to [Bacon's] day… technological progress had been the results of small and accidental inventions made by craftsmen. Formal knowledge (what we refer to as science or propositional knowledge) had to date done very little to discover the underlying natural regularities that governed technology (ibid.).

Bacon helped to bridge the gap. Science and mathematics have practical purposes, and when leveraged by a larger group, including skilled artisans or craftsmen, can lead to greater innovation and advances in technology. To put a finer point on it: it was not simply that craftsmen were *using* new technology, but that they understood the underlying "knowledge of *how* and *why* new techniques worked" (Spolaore 2020: 779).

At the same time, there was a change in the cultural beliefs around the spread of knowledge in society. Mokyr points to an intellectual community in early modern Europe known as Respublica Literaria, or the Republic of Letters. Mokyr (2016: 186) explains,

> It was an 'invisible college' of internationally connected scholars and intellectuals, based on the implicit understanding that knowledge was a nonrivalrous good to be distributed and shared by the community. The community constituted an elite group of intellectuals and scientists who circulated and checked new knowledge through an epistolary network, the printing press, and local meeting places of scholars.

Mokyr argues that the Republic of Letters helped to establish what has become the modern ethos of science. The ethos has four characteristics: universalism (knowledge applies to all groups), communal in nature (the importance of placing knowledge in a public domain), disinterestedness (a search for truth), and organized skepticism (Merton 1973, Mokyr 2016: 201 footnote 33). These norms continue to support the search for truth and an environment of innovation today in the 21st century.

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the 'science of man' would soon be similarly reduced to well-understood, elegant laws" (ibid.: 101).

The following parts 1 and 2 outline the contents of the *Annual Proceedings*. Part 1 begins with a new contribution from Mokyr on the topic of diversity and economic growth. The following chapters in Part 1 expound upon Mokyr's research program, revisiting the pre-conditions for the British Industrial Revolution, investigating the relationship between institutions of higher learning and economic growth, and applying Mokyr's framework of cultural change to gender norms and women's economic choices. Part 2 offers an economic history of Beloit, Wisconsin with four original chapters on the people, industry, and institution of higher learning, Beloit College, that have shaped the trajectory of the City from the 18th century to today.

Part 1: New chapters on understanding modern economic growth

In his keynote, presented here in chapter 2, Mokyr addresses a topic of great importance for liberal society – diversity. Mokyr asks how do we understand diversity? He offers clear definitions of diversity, tolerance, and pluralism. According to Mokyr, "a diverse society is composed of coherent groups that differ from one another in an important and observable characteristic shared by members of the group. Hence the aggregate has a higher variance in that dimension than a non-diverse society" (ibid, 23.). As an economic historian, Mokyr is interested, what are the effects of diversity on economic growth? His answer takes us back to institutions. When a society has pluralist institutions, diversity can lead to economic growth.

Mokyr examines the relationship between diversity and economic growth through a collection of historical case studies. One of the case studies is the Reformation and Enlightenment. In the 16th century, anti-pluralist institutions led to violence against religious diversity. Not coincidentally, this period was not a period of economic growth (no respect for human life, let alone other physical property, nor tolerance for ideas that could have brought forward advances in thinking and innovation). By the 19th century, the Enlightenment brought forward a foundation that supported pluralist institutions, and with it, diversity and economic growth.

In chapter 3, Jared Rubin skillfully summarizes the literature on economic growth, drawing on his book with Mark Koyama, *How the World Became Rich The Historical Origins of Economic Growth* (2022). Rubin explains Mokyr's contributions pointing to technological change, the role of the Enlightenment,

and the particular conditions in northwestern Europe in the late 18th century that led to the British Industrial Revolution. Rubin is careful to say that identifying the relevant variables does not mean that they offer a blueprint; what works in one country during one time certainly may not be effective in promoting sustained economic growth in another place at another time. Rubin argues that the relevant preconditions in Britian ahead of the industrial revolution were limited governance that gave rise to Parliament, access to a large market that in turn, led to increases in personal consumption, and an abundance of skilled workers.

Ralf Meisenzahl explores the population of skilled workers in Germany in his chapter, "Upper tail human capital formation and its economic effects" (chapter 4). As he explains, if technological change and skilled workmen were important for spurring the British Industrial Revolution, what factors might lead to increases in these variables? Meisenzahl, from Germany, investigates whether state-sponsored regional universities in Prussia (Gewerbeschule) led to increased economic growth, measuring the number of manufacturing facilities and number of inventions. Meisenzahl makes use of city-level manufacturing data for 2,254 towns in German-speaking Europe constructed by Dittmar and Meisenzahl (2022). He finds a positive relationship between the presence of a university and economic growth.

In chapter 5, Rosemarie Fike applies the "Mokyrian cultural lens" and Mokyr's four catalysts for cultural change to our understanding of gender norms. Fike illustrates how these factors are at play in shaping gender norms and women's economic choices, focusing on the context of the United States. She applies this framework for cultural change to two case studies: one uncovering the story of Western expansion and women's rights and another chronicling Claudia Goldin's work on female labor force participation over a century. In her chapter, Fike shows how Mokyr's treatment of culture can help us to better understand many different aspects of social change.

Part 2: Understanding the economic history of Beloit, Wisconsin

The second half of the volume travels from Europe in the 18th and 19th century to Beloit, Wisconsin in the 19th century. The early settlers of what would become Beloit arrived during the First Industrial Revolution. The first settlers to the United States had come more than one hundred years earlier, many fleeing persecutions in Europe. As McKenzie explains in chapter 6, those who came to Beloit

were part of a group heading west in search of land and economic opportunity. Many of the themes from Part 1 come into play: the role of geography, a labor force of skilled workers who support industry, and the emergence of institutions of higher learning. The collection of four chapters tells the history of the City of Beloit through its people (chap. 6), the economy (chap. 7), the founding of Beloit College (chap. 8), and participation of women in the labor force (chap. 9).

Beatrice McKenzie provides a description of the people of Beloit, dividing her chapter into native sovereignty and U.S. territorial ambitions (17th century – 1840s), settlers and old immigrants (1836-1900), and new immigrants and African Americans (1900-1930). As McKenzie explains, when the first settlers arrived in the area, they were on native lands. In 1829, the largest of the Ho-Chunk villages, Turtle, had approximately 700 people. The Native Americans were deported from the area and later the U.S. acquired the area by treaty. The first white settlers were from New England, and later, Germany, Ireland, and Scandinavia. Later, they were joined by immigrants from Italy, Greece, Lithuania, Mexico, China, and during World War I, African Americans from southern states. McKenzie argues that immigrants stayed because of opportunities in industry and access to good schools.

In chapter 7, Rob Gerbitz explains that access to the Rock River (and water power) was one of the major reasons that industry formed in Beloit. The early settlers from New England established foundries and mills along the river. Gerbitz tells the industrial history of Beloit through the story of the Beloit Iron Works, a company that over many decades made agricultural tools, papermaking machines, and water wheels. In addition to industry, Gerbitz shares some history of agriculture and dairy in the area. Gerbitz honors and celebrates this history in the buildings that he constructs in the City of Beloit today, as the President and CEO of Hendricks Commercial Properties. In his chapter, he shares how he is working to promote the economy of Beloit into the 21st century.

As more immigrants arrived in Beloit and early industry started to take form, a group of men gathered with an idea to start a college in Beloit. Fred Burwell shares the history of Beloit College in chapter 8, chronicling the contributions of several key figures in the College's history: reverends Stephen Peet and Aaron Lucius Chapin (the College's first President), and Serano T. Merrill (also a player in industry, described by Gerbitz in chap. 7), among others. The themes of hardship and doubt, told in chapters 6 and 9 ring true for the College's history as well. And yet, they persevered, with the assistance of many from the community of Beloit,

and Beloit College remains the oldest (continuously running) college in the state of Wisconsin.

In chapter 9, Louise Claussen examines what Census data can tell us about the female labor force participation rate (FLFPR) in the early 20th century in Beloit, Wisconsin. Claussen uses Claudia Goldin's "The Quiet Revolution That Transformed Women's Employment, Education, and Family" as a framework to analyze the period of 1910-1950. Claussen illustrates the evolution of labor force participation by women over these decades and compares it to national averages. Overall, the trends among women in Beloit resemble national averages, with increases in the FLFPR over time among both married and unmarried women.

Acknowledgements and thanks

I need to begin by acknowledging the man for whom the forum is named. Former President of Beloit College (1954-1975), R. Miller Upton was a nationally recognized leader in higher education. President Upton had two passions. First, he believed that small residential liberal arts colleges were the ideal places to engage with "great questions" because at places like Beloit College students are expected to acquire the intellectual habits necessary for critical thinking and civil discourse. Second, he believed in the ideals of a liberal society: political freedom, the rule of law, and peace and prosperity through the voluntary exchange of goods and ideas. For President Upton, the critical and open discourse fostered by liberal education was crucial to building and maintaining liberal democracy. Liberal education was crucial to developing a free and responsible citizenry.

Next, I need to acknowledge two people who created the Upton Forum at Beloit College, inspired this 2023/24 Upton Forum, and serve as examples to me of the responsible citizenry that maintain liberal democracy. Those two people are Emily Chamlee-Wright and Jeff Adams. Emily was the first Elbert Neese Chair and led the Upton Forum from 2008-2012. She set a high standard. Importantly, Emily was my teacher and mentor when I was an undergraduate at Beloit College, and she was the person who introduced me to economics and ignited my curiosity in the big questions. Jeff Adams was also my teacher and mentor and continues to be a guiding force for me. The inclusion of an economic history of Beloit is very much inspired by Jeff, who insists that people ought to know their place and have a responsibility to make their communities better. Jeff has played a large role in the revitalization of the City of Beloit, creating Beloit 2000 (which became Beloit

2020, then Beloit 200) and putting in decades of hard work and love.

I would like to thank my colleague, Diep Phan, who most recently led the Upton Forum. She has helped me to transition to the role and provided helpful guidance along the way.

Thank you to Jennifer Kodl, who is the coordinator of the Upton Forum (in addition to many other roles). Jennifer has brought the highest level of professionalism to the Upton Forum and other programs in the Department of Economics and Business.

Thank you to Fred Burwell, emeritus archivist of Beloit College, for working with several of the students in the senior seminar course as they did research for their projects, providing an excellent College tour for the class, and for patiently answering all of my questions about the College and City history. Fred is an incredible asset for Beloit College and the City.

Thank you to all the community members who joined us for the Upton Forum this year. We hope that you join us again for a future Upton Forum. A special thank you to Kerry Frank who shared posters featuring different businesses of Beloit.

Thank you to the students in the senior seminar in economics for engaging in this topic and welcoming the invited speakers.

Last, but certainly not least, thank you to all the donors of the Upton Forum and programs. This Annual Proceeding provides a unique recognition of the Neese Family, as Rob Gerbitz' chapter shares the history of Beloit Iron Works and later, Beloit Corporation. Thank you to the Neese Family Foundation for supporting the City and for your generous gift to the Upton Forum. Thank you to other donors and especially Bill and Alison Fitzgerald and Bob and Jerry Virgil, who saw the value of this programming for a liberal arts education.

References

Abramitzky, R. 2015. "Economics and the Modern Economic Historian." *The Journal of Economic History* 75(4):1240-1251.

Boyd, Robert and Peter Richerson. 1985. *Culture and Evolutionary Process*. Chicago: University of Chicago Press.

Chamlee-Wright, E., Joshua C. Hall, and Laura E. Grube. 2017. "Cultivating the liberally educated mind through a signature program." *The Journal of Economic Education* 48(1): 34-44.

Colander, D. and K. McGoldrick. 2009. "The Teagle Foundation report: The economics major as part of a liberal education." In D. Colander and K. McGoldrick (eds.), *Educating economists: The Teagle discussion on re-evaluating the undergraduate economics major*, Cheltenham, UK and Northampton, MA: Edward Elgar, pp. 3-31.

Dittmar, Jeremiah E. and Meisenzahl, Ralf R. 2020. "Public Goods Institutions, Human Capital, and Growth: Evidence from German History." *Review of Economic Studies* 87(2): 959-996.

Koyama, Mark, and Jared Rubin. 2022. *How the World Became Rich: The Historical Origins of Economic Growth*. Cambridge: Polity Press.

Kronman, A. 2007. *Education's end: Why colleges and universities have given up on the meaning of life*. Princeton, NJ: Yale University Press.

Kuran, Timur. 2011. *The Long Divergence: How Islamic Law Held Back the Middle East.* Princeton, NJ: Princeton University Press.

McCloskey, Deirdre. 2016. *Bourgeois Equality: How Ideas, Not Capital or Institutions, Enriched the World.* Chicago: University of Chicago Press.

Merton, Robert. 1973. The Sociology of Science. Chicago: University of Chicago Press.

Mokyr, Joel. 2016. *A Culture of Growth: The Origins of the Modern Economy*. Princeton, NJ: Princeton University Press.

---. 1990. *The Lever of Riches: Technological Creativity and Economic Progress*. Oxford: Oxford University Press.

---. 2003. "The Oxford Encyclopedia of Economic History" (Vol. 1). New York, NY: Oxford University Press.

Spolaore, Enrico. 2020. "Commanding Nature by Obeying Her: A Review Essay on Joel Mokyr's A Culture of Growth." *Journal of Economic Literature* 58 (3): 777–92.

Storr, Virgil Henry. 2013. *Understanding the Culture of Markets*. New York, NY: Routledge.

Tabellini, Guido. 2010. "Culture and Institutions: Economic Development in the Regions of Europe." *Journal of the European Economic Association* 8(4):677-716.

Weber, Max. 1905/1930. *The Protestant Ethic and the Spirit of Capitalism*. Translated by Talcott Parson. London: Allen and Unwin.

The Benefits and Costs of Diversity: Lessons from Economic History

Joel Mokyr [1] [2] [3]

Introduction

Diversity is widely seen today as a desirable objective. Universities have "diversity officers" whose job it is to increase diversity and encourage the inclusion of under-represented minorities. By *diversity* I mean outcomes of economic and social processes. A diverse society is composed of coherent groups that differ from one another in an important and observable characteristic shared by members of the group. Hence the aggregate has a higher variance in that dimension than a non-diverse society. Diversity is traditionally measured by a dispersion metric such as the Herfindahl index. Many traits, such as being Jewish, are interchangeable with "identity," which is recognized by both those who have the traits and thus belong to the group and by "others," who do not.[4] The pertinent question of diversity is how are different sub-populations sharing recognizable different traits represented across the economy and what are their relative socio-economic status, political power, etc.?

There are many traits that can be deployed to define diversity. These fall,

1 Joel Mokyr, the 2023 Miller Upton Scholar, is the Robert H. Strotz Professor of Arts and Sciences and Professor of Economics and History at Northwestern University. He specializes in economic history and the economics of technological change and population change.

2 I am indebted to Chris Sims and Franco Malpassi for excellent research assistance, to Rohini Somanathan and Soumendu Sarkar for many useful suggestions and to Scott Miller for comments on a different version.

3 Some parts of this essay have been adapted from Mokyr (2024).

4 The "traits" that actually define the identity of individuals often work through compound traits, e.g., French Canadians or Orthodox Jews, thus created nested traits in which diversity can be defined over groups and subgroups.

roughly speaking, into two classes: those that are hard-wired in people such as race, ethnic origin, and other phenotypical features, and those that are acquired culturally during socialization, such as language, religion, ethical values, and ideology. The latter class of course means that the feature is a matter of choice, although the default option is to mimic one's parents. The two classes create different sources of resentment of "otherness." Traits that are a matter of choice may lead to resentment among the majority group precisely because a minority could have conformed to the traits of the majority but chose not to. Hardwired traits may breed resentment when they tap into much deeper sources of homophily and xenophobia, fear of the unfamiliar and so on. For the historian an attractive dimension of diversity is religion, to which I will return below.

As noted, in many organizations in the industrialized countries there is a sense that diversity is desirable, and policies to enhance it are in force. These policies have two sources of support: one is based on ethics, the other is on efficiency. The former justification is that low diversity is the result of sins of the past such as colonialism and racism involving systemic discrimination against some groups that are now under-represented. Hence fairness and justice demand that these be addressed. A different idea is that low diversity, whatever its causes, is inefficient. It is argued that higher diversity improves economic performance and stimulates creativity and growth by drawing on a larger pool of cultural material and a more diverse reservoir of experiences and attitudes, and thus increases the potential for innovation and effective management and cooperation.[5]

The enthusiasm of the supporters of diversity's positive efficiency effects notwithstanding, there are clearly *both* benefits and costs to greater diversity, and their net impact on economic performance and progress vary over time and across societies and industries. The literature on the topic is large, and in the essay below I will only be able to deal with selected aspects of it, as exemplified by historical case studies. Before doing so, it is important to define carefully the differences between the three key concepts of diversity, tolerance, and pluralism, and take a closer look at what economic analysis has to add to our understanding of these three concepts. I will then argue how economic history sheds light on the complexities of the economic effects of diversity.

The basic answer to the question whether the economic effects of diversity are positive or negative can be summed up here. My answer is a variant on what is

5 The canonical sources for this argument in economics are Page (2007) and Florida (2012).

known in the history of technology as "Kranzberg's first Law" — diversity is neither good nor bad, nor is it neutral (Kranzberg 1986: 454).[6] What this statement means is that the effect of diversity can be substantial, but its net impact on economic efficiency and growth depends on the institutions of society. Much like the effects of innovation and natural resources, it can be either a curse or a blessing.

1. Some Definitions

Terms like "diversity," "tolerance, and "pluralism" are used frequently in this literature and need some careful definitions if we are to unpack the effects of diversity.

Tolerance here will be defined as a pure matter of preferences, that is, culture. One natural way of defining it is by asking how much an individual objects to what "others" believe, behave, or what they look like. What matters here, then, is how individuals regard and treat people that have a particular trait that places them into a different group and thus can be seen as "others." In the limit, perfect tolerance means we are utterly indifferent to what others believe as long as they do not act on it in a way that harms anyone else.

A more formal representation of tolerance would be something like the following. Assume an individual has a utility function as follows:

$$U_i = f(\boldsymbol{X}.....\lambda C_j, \mu H_j)$$

Where U_i is the utility of individual i, C_j are the cultural beliefs of individuals j $(j \neq i)$ and H_j are other attributes of individuals j that i may care about such as his race, language, dress, phenotype and so on. λ and μ are reverse "measures of indifference." If $\lambda < 0$, i may disapprove of j's religion ("heresy" or "infidels"), her ideology, or other cultural beliefs. A high absolute value of λ means "intolerance." If $\mu < 0$, it could be defined as a measure of "racism" or "xenophobia."

Tolerance thus measures a willingness to "let a hundred flowers bloom." It is also a (reverse) measure of homophily, the degree to which we have a liking for

6 Kranzberg's original statement in a remarkable presidential address pertained to technology, of course. In his own words, the same technology can have different effects depending on the context and environment in which it is introduced. Another remarkable law is his fifth law that "All history is relevant but the history of technology is the most relevant" (1986: 553) — a statement that may not be applicable to diversity with the same force.

others who resemble us in their religion, language, ethnic background, phenotype and so on. Given that homophily (and hence an aversion of "others") appears to be hardwired into our preferences (Fu, Nowak, Christakis, and Fowler 2012), society has to set up institutions that constrain behavior to act on those aversions. Indeed, it may well be the case that, as one eminent psychologist has said, that "The evolution of cooperation requires out-group hatred. Which is really sad."[7] While institutional constraints may not necessarily make people more tolerant (that is, change their preferences favoring their own group), it will affect their behavior.[8] The existence of feedback from institutions to preferences, however, implies that the preferences may eventually change and become more tolerant.[9] If individuals grow up in a society that has strong pluralist institutions, they may internalize those norms in their preferences and become more tolerant. Optimally "good" pluralist institutions are the ones that permit people to hold and express idiosyncratic beliefs and expression but prevent actions conditional on those beliefs if they have negative spillover effects.

The *institutions* that prevent people from realizing their homophilic or other intolerant preferences are what I what I mean by *pluralism*.[10] Pluralist institutions can be seen as "civilizing agents" — they set the rules that prevent intolerant people from acting on their aversions and instincts and overcome their "natural" proclivity to be suspicious of others who look, behave, think, or talk differently. Even countries with "good" institutions are subject to the consequences of homophily and intolerance. Pluralist institutions, by restraining individual behavior driven

7 Nicholas Christakis, as cited in the *Washington Post*, Jan. 20, 2024. It might be thought that the evolutionary justification for these preferences is that traits promoting in-group cooperation and out-group hostility could be favored by natural selection in models of group-selection. It is also possible that homophily is a rational response to the risk of unreciprocated cooperation. If acts of cooperation and generosity are contingent on the other person being a member of the group this can increase the odds that he or she will eventually reciprocate (Christakis 2019: 263).

8 "Tolerance" (a set of preferences) will thus have to be distinguished from "toleration," which is often used to describe both the belief in religious freedom and its practice, and thus can be seen as an equilibrium outcome (Zagorin 2003: 7).

9 Institutions can successfully bring about cultural change by successful propaganda and steering education and social conditioning in one direction or another. Of the many examples that illustrate this point, a striking one is the success of Nazi educational policies to install antisemitic ideas in German youngsters, a culture that survived into the post-war period. See Voigtländer and Voth (2015).

10 The important distinction between culture, that is, preferences and institutions, that is, the rules, norms, and incentives that society imposes on individuals to constrain their behavior, are essential here. Without explicitly making the distinction, the difference between the two is the logical foundation of the analysis provided by Scanlon (2003). Intolerance is defined by Scanlon as claiming a special place for one's own values (which is clearly "culture") and the right to suppress other ways of living (which would require institutions). The former form of intolerance should itself be protected by pluralism, the latter most definitely not.

by intolerance can attain the economic advantages of diversity while minimizing the costs. They involve an implicit recognition that, despite disagreements, the different groups share a common denominator that transcends these differences (Scanlon 2003: 193). Indeed, a prime candidate for such a common denominator would be the pluralist institutions themselves. Yet if pluralism is to be taken to its full logical conclusion, it would include the right to challenge the accepted rules of pluralism itself.

The ambiguities of pluralist institutions must be recognized. The right to free speech, the most obvious of all pluralist institutions, has to be limited somewhere if it leads in high probability to actions that involve real costs such as violence. How high does that probability have to be to justify a limit on what one can say? Moreover, while pluralist institutions are expected to be welfare enhancing in general, we cannot say for sure that they are inevitably strictly Pareto-improving, since those with strong homophilic preferences may be made unhappy by laws and arrangements that allow minorities to exercise their rights. This may seem a pedantic point if exercising such rights involves no externalities, but when, for instance, the right of free speech permits offensive and hateful language, a welfare cost may be incurred. Thus, one can make the argument that holocaust-denial could be made illegal (as it is in Germany and Austria) or explicitly espousing Eugenics and racism on the basis of social welfare.[11] In some cases, the opposing rights of two groups both relying on pluralism can lead to what Scanlon calls "gridlock," yet as he recognizes, pluralist institutions, while imperfect, are a second best.

Pluralist institutions, unlike tolerance, are not individual choices and are taken parametrically given by each individual. Examples include universal franchise, making minority languages official, complete freedom of worship and religion, and outlawing discriminatory practices such as redlining, higher education quotas, and similar rules that benefit specific groups at the expense of others.[12] Moreover, pluralist institutions rule out the use of any form of violence

11 Another ambiguity arises when an organization is established among people sharing a particular set of beliefs, such as a political party or a church. If some member then disagrees with the main tenet of the organization, pluralism would not be violated if this member were excluded — as opposed to a case in which she/he were excluded for some irrelevant trait. However, what is true for a specific organization is not true for society as a whole. Even those opposed to pluralism itself would still have their speech protected by it (Scanlon 2003: 194-95).

12 A possible exception is the use of quotas and other rules to compensate groups for past discrimination that have led to a long-run uneven playing field, such as affirmative action. Yet in a purely pluralist society, such compensating practices would be phased out eventually.

and coercion in the market for ideas. In a culturally and ideologically diverse society, the market for ideas is the arena in which people compete, that is, try to persuade one another. Competition between ideologies and religion is natural and probably salutary, but like all forms of competition, the exact margins at which competition is permissible are described by institutions. Institutions, much like rules that underlie the operation of all markets, can be pluralist or not, and they determine the welfare effects of the market. In pluralist markets for ideas, means other than peaceful persuasion — such as violence of any kind and persecuting opponents — are proscribed.

The exact connection and interaction between tolerance (that is, culture) and pluralism (that is, institutions) is always complicated and the two co-evolve in subtle and complicated ways, as culture and institutions are apt to do (Alesina and Giuliano 2015). Obviously, if an overwhelming majority of society is highly tolerant, this is likely to lead to pluralist institutions. But at times fanatically intolerant minorities that acquire power (for possibly unrelated reasons) may impose a highly anti-pluralist set of institutions, as happened in Germany in the 1930s and is still the case in countries such as Afghanistan under the Taliban. Furthermore, when there is a sudden unanticipated shock to diversity, say due to sudden immigration or a religious shock (such as the Reformation), it can in turn increase intolerance and eventually weaken pluralist institutions.

2. Contemporary Evidence

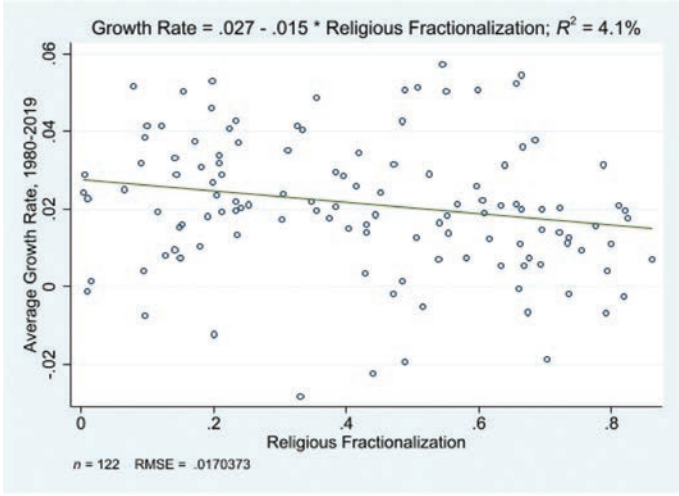
Social scientists and economists have spent the past quarter century confronting the question of whether diversity is good for economic performance and growth, but a survey of the literature reveals that there are no simple one-line answers. One issue with isolating the effect of diversity on economic performance is simply identification. The framework outlined above suggests why: pluralist institutions tend to support the presence of successful minorities who may contribute to economic success, and the kind of syncretic cultural effects that augment the pool of productive ideas. But pluralist institutions tend to be correlated with other institutions that foster creativity and open-ness to novelty and efficiency, and the correlations might thus be spurious.[13]

13 A good example is the experiment of the young Soviet Union with a policy of greater tolerance for minority cultures known as *korenizatsiya* in which non-Russian minorities were allowed to a limited extent to

The evidence of contemporary economies can be conveniently subdivided into macro- economic and microeconomic evidence.[14] The macro evidence is largely based on cross-country or panel datasets and uses various measures of fractionalization as the proxy for diversity. Alesina and LaFerrara (2005) produce some useful estimates for religious, linguistic and ethnic fractionalization and its input on GDP growth rates (or levels). Below I reproduce these figures, extended to 2019.

Graph 1.

Growth Rate vs. Religious Fractionalization

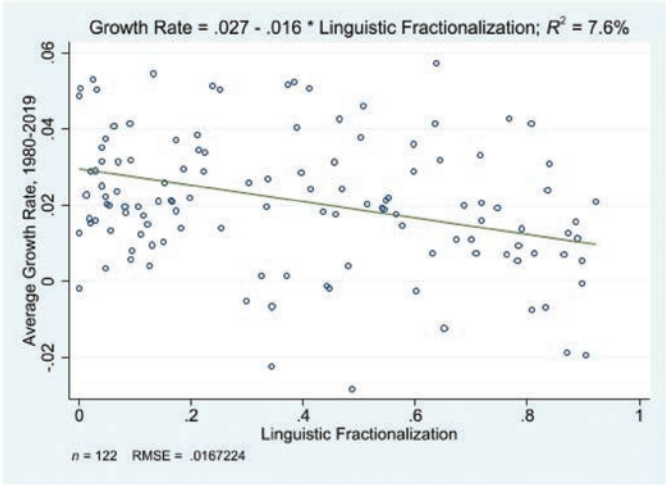


engage in cultural activities specific to their ethnic group and language. Although the stated purpose was to extend the reach of the Communist Party into non-Russian minorities, it was a de facto pluralist approach lasting to the early 1930s. The years of the liberalization policy overlapped roughly with economic stabilization and recovery — but any causal connection between the two would be an artifact of the temporary institutional liberalization that was promulgated top-down by a small number of Bolshevik leaders.

14 These are not new questions: Thomas Aquinas argued that diversity among creatures was necessary in order that "the divine goodness might the more perfectly be bestowed on things" and adds "there should be diversity among them, so that what could not be perfectly represented by one single thing, might be more perfectly represented in various ways by things of various kinds." Cited by das Neves and Melé (2013).

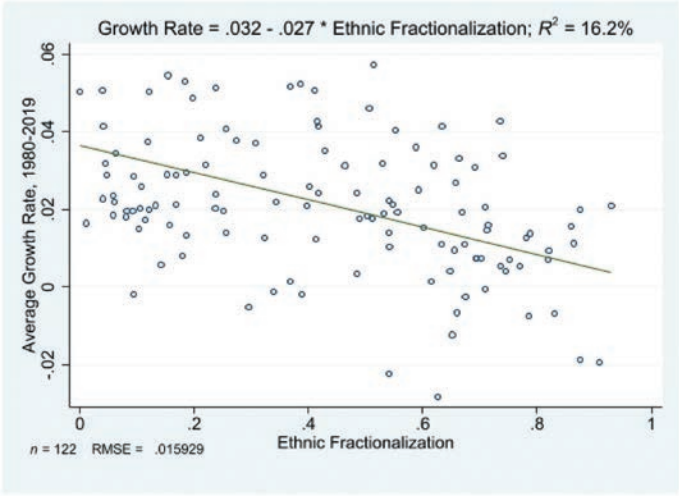
Graph 2.

Growth Rate vs. Linguistic Fractionalization



Graph 3.

Growth Rate vs. Ethnic Fractionalization



They clearly show that the raw correlations are weak, and adding further controls (not reported) does nothing to improve them. All three slopes are negative, however, which probably indicates that on balance the negative factors of fractionalization slightly dominate the positive factors. A weak but negative

relation between ethnic fragmentation and economic growth was found by the seminal paper in the area (Easterly and Levine 1997) and confirmed by subsequent work looking at fractionalization (Alesina et al. 2003).[15] Without specifying a much more detailed structural model, at this point the net effect of diversity on the macroeconomy is weak.[16] More specialized studies of the effects of ethnic diversity confirm that its effect on the economy is, on average negative. Besley and Persson (2011:160-167) report that ethnic homogeneity (low diversity) is positively correlated with such outcome variables as low levels of corruption, ease of doing business, and access to credit. For other outcome variables, however, the relations are statistically insignificant, and on the whole the relationship between ethnic diversity and economic growth is not very strong, but on balance seen as negative.

Detailed historical case studies of specific nations are few, but Menyhert (2016), in a detailed study of the highly diverse Hungarian part of the Habsburg Empire in 1910, finds that ethnolingual and religious diversity had a positive (if small) effect on economic development as approximated by the growth in the tax base. A recent confirmation of the association of diversity and technological progress is provided in a pioneering paper by Cinnirella and Streb (2017), who show that in a large sample of nineteenth-century German cities, the ones that were the most diverse also had the highest rate of patenting. It should be added, however, that they concede the pitfalls of using diversity (an outcome) as a proxy for religious tolerance (a cultural value), without the proper distinction between tolerance and pluralism proposed above.[17] Clearly, on the macro level, diversity

15 Alesina et al. find that religious fractionalization, unlike ethnic and linguistic measures, are basically uncorrelated with economic growth. As we will see below, historically speaking there may be a relation, but a simple specification that looks at religious diversity's effect on economic growth may be oversimplified.

16 The classic paper of Fearon and Laitin (2003) suggests that the relationship between diversity and conflict is weak. Their work suggests that once economic and geographical factors are controlled for, various measures of diversity have no explanatory power for conflict. Other definitions of diversity that account for dissimilarities and the coherence of groups (summarized as "polarization") do, however, correlate with armed conflict. Again, careful definitions matter here. Fractionalization is related to "diversity" but quite distinct from the concept of "polarization," which is high when, for instance, society consists of two large-sized groups (e.g., Muslims and Hindus in India) but low when society consists of many small groups. Polarization is strongly related to the onset of civil conflict (Montalvo and Reynal-Querol, 2005). More recently, Abatli, Ashraf, Galor and Klemp (2020) have argued that diversity within in addition to across ethnic groups is strongly correlated with conflict.

17 While Cinnirella and Streb find a statistically significant effect of religious diversity on patenting, their regressions (once a dummy variable for location is dropped) explain no more than 4 percent of the variation in patenting across the 1,274 towns in their sample (somewhat better in a sample of 452 counties).

has both salutary and deleterious effects, the latter focusing on its negative effect of fractionalization on social capital and trust (Alesina and LaFerrara 2005). It is not surprising, then, that well-designed studies still find contradictory results.

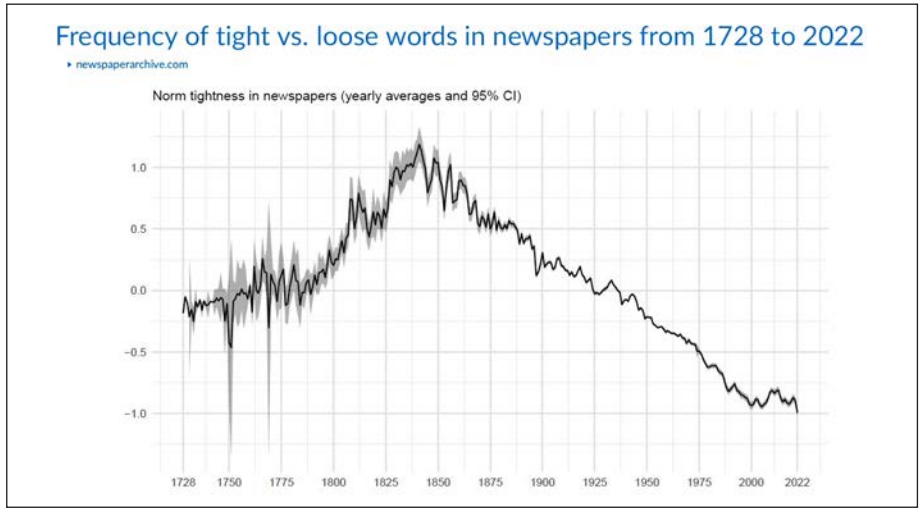
On the microlevel, empirical research is extensive but the evidence is equally mixed. One meta-analysis (Stahl et al. 2010) finds that cultural diversity at the firm level inherently involves trade-offs, meaning that the "optimal mix" may vary depending on the specific task at hand. Furthermore, culturally diverse teams had higher creativity (as postulated by Scott Page 2007), but also more conflict and less social integration. Cultural diversity does not have a direct impact on team performance but the effect is indirect, mediated by "process variables" such as creativity, cohesion, and conflict; and is moderated by contextual factors such as team tenure, the complexity of the task, and whether the team is co-located or geographically dispersed. In another survey, Stahl and Maznevski (2021) find that a meta-analysis based on 44 studies conducted between 1985 and early 2018, indicates that deep-level (cultural and knowledge-based) diversity is associated with more creativity due to its relationship with higher information diversity. This effect tends to be stronger when the team is co-located or is engaging in a task with high interdependence. Surface-level (phenotypical) diversity, which can raise social identity threats, was negatively related to creativity and innovation for simple tasks.[18] In short, there are many cases that confirm Richard Florida's and Page's enthusiasm about diversity but also many that do not. Perhaps historical studies can shed a different light on the matter.[19]

A more indirect measure of the effect of changing culture is to look at a measure of intellectual or cultural diversity over the long haul in recent times. Michele

18 A good example of the ambiguity of diversity at the firm level is a survey by Rock, Grant and Grey (2016). The paper argues strongly that more diversity leads to higher profitability, more innovation and more revenue, yet many companies that tried to recruit a more diverse workforce experienced that "success so far has been marginal." The reason, they argue, is that work in a diverse team is more strenuous and difficult, but that this higher effort — in some experiments — yielded better results. Bringing "different viewpoints" to the discussion was on the whole valuable, as opposed to different values, which they note, can produce corrosive conflict. The difference between "viewpoints" and "values" may be more elusive than they recognize.

19 Recent research has taken a new look at the effects of religious fractionalization in the past on current institutional conditions (Cosgel, Miceli and Yildirim 2023). What they find is that if historically the government did not follow the principles of pluralism but favored one religion at the expense of another, it led to more civil strife after 1960. They find that civil conflicts in the post-1960 period were in part driven by religious fragmentation in which the ruler strongly favored one religion over another. Political and religious favoritism produced negative legacy effects. This finding constitutes a nice application of Kranzberg's Law: it is not so much the fragmentation itself but the institutional environment in which it takes place that decides what the effects of diversity are.

Gelfand (2018) has pointed to the degree to which individuals conform to societal norms and values as an interesting variable. It measures the level of adherence or conformity to the established norms and expectations within a society or a particular social group and can just be taken as a proxy for cultural diversity. When a society or group exhibits high norm tightness, it means that there is a strong emphasis on conformity, and deviating from the accepted norms is discouraged or met with disapproval. Conversely, low norm tightness indicates a greater degree of tolerance for non-conformity and a more permissive attitude toward deviations from established norms. In a pioneering application of Gelfand's ideas, Max Posch (2023) has analyzed a large database of US newspapers between 1728 and 2020 and derived a norm-tightness index based on natural language processing. The result, reproduced in fig. 2, shows a rising norm-tightness in the US before the middle of the nineteenth century, and then a continuous declining trend between c. 1850 and 2000. The declining trend ends at the end of the twentieth century and has become stable in the twenty-first century. It may be no accident that the decline in norm-tightness coincides with an era of unprecedented innovation and scientific creativity in U.S. history (Gordon 2016), but that is far from establishing a causal connection.



Source: courtesy of Max Posch, 2023

3. Lessons from History I: Pluralism and Minorities

The effects of diversity on economic performance can be better understood from historical cases in which minorities of one kind or another dwelled amidst a majority of people who differed from them in some observable way. The canonical example is the presence of Jews in the Christian and Muslim worlds. Similar groups were the Roma people, Armenian migrants in the Middle East, German settlers in southern and eastern Europe, Parsi and Irani groups in India, and Chinese migrants in Indochina and Indonesia. Did economic factors influence the relationship between the majority in- group and these minorities? One sad lesson from history is that pluralism may well lead to beneficial outcomes for both ingroup and outgroup yet may not become permanently enshrined in the institutions of society.

In a remarkable paper, Saumitra Jha (2013) has written down the economic principles that may predict when a minority will be treated in a pluralist way, at least under normal circumstances. These can be summarized conveniently as Jha's principles of pluralism, and list when and under what circumstances the minority has a better chance to be well-treated.[20]

1. Complementarity: If the two groups produce goods or services that are basically complementary, and if the majority recognizes these benefits, they are likely to allow the minority considerable freedoms and profit from their existence. The inhabitants of the Jewish shtetls in eastern Europe provided a host of valuable services in retail, transportation, finance, tavern keeping, and more, whereas the majority population was heavily agricultural (Petrovsky-Shtern 2017). In eighteenth-century Germany, court-Jews provided administrative services and in Poland at that time they provided estate management.
2. *Locked-in specialization*: The majority (local) group should not be able to replicate or seize and then successfully deploy the capabilities and resources that the out-group uses more intensively. If the minority group, being politically weaker, derives its economic success from a resource that can be readily expropriated, the temptation for the majority to do

20 Jha's test case is the position of Muslims in Hindu India, but his model works well for most minorities.

so may be very strong. Service minorities had an incentive to specialize in activities that depended on human capital (such as medicine and management) or relied on networks of trusted fellow in-group members.[21] When such lock-in conditions weakened, the pluralist equilibrium could be upset.[22]

3. *Size and inequality:* The "non-local" group should not be so small and/or so economically successful that it accumulates huge wealth, especially wealth that is transparent and easy to expropriate such as luxury homes and large estates. Such assets may give the larger and politically stronger group a temptation to seize them and the vulnerable minority may be in a weak position to protect their assets.
4. *Vulnerability:* There should not be a large vulnerability gap in that one group is organized for violence and the other is not and basically defenseless. That includes the presence of an outside option for the outgroup and the portability of their assets.
5. *Redistribution*: Assuming the minority is economically successful, what is further conducive to a reasonably harmonious relation is a set of mechanisms that redistribute income between the two groups without violence while maintaining incentives. An example is a tax assessed on the successful minority (but not at confiscatory rates) and redistributed as rents to the people in power. This creates a powerful incentive for both sides to create a pluralist modus vivendi.[23]
6. *Intertemporal tradeoff:* The discount rate of the majority class is not too high for them to ignore the long-term effects of losing the benefits of the

21 The best-known example is the network of Maghribi traders, made famous by the classic work of Avner Greif (2005). A more recent paper notes the importance of "community networks" and their role in providing credit and information to trusted members of out-groups in economies in which markets were still underdeveloped (Gupta et al. 2022). Such community networks are especially important in societies in which communitarian values were prevalent, as opposed to more market-friendly universalist values (Enke 2023).

22 This is effectively the argument made by Becker and Pascali (2019), who maintain that the Reformation weakened the prohibition on lending at interest in Protestant regions, and turned Jews and Christians from strong complements to weak substitutes in those areas. The ensuing decline in the economic gains from pluralism explains the higher incidence of antisemitism in Protestant areas of Germany. The insight of Slezkine (2004; 2nd ed. 2019) is similar: antisemitism in Eastern Europe flared up in the second half of the nineteenth century because the skills that Jews had in service occupations could be more easily reproduced by non-Jews, who then used political power to displace Jews and keep them out.

23 An example of such an arrangement is provided by Botticini (2000, p. 166) who shows how the profits of Jewish moneylenders benefited the public finances of the communes in which they lived. Italian town governments turned to Jewish lenders for funds, via taxation or loans.

minority. In cases of national emergency the discount rate would peak, and the temptation to expropriate the vulnerable minorities would be too tempting.

To those six principles, all enunciated or implied by Jha, one could add two more of considerable historical importance.

7. *Political Entrepreneurs:* Pluralist institutional structures should be resistant to political entrepreneurs, usually populist demagogues or ideological fanatics, who foster and exploit a culture of intolerance and xenophobia to draw political rents from inciting the majority population against some convenient target such as a vulnerable minority. These instances of the "economics of hatred" (Glaeser 2005) are all too common and they can easily negate the substantial economic benefits of pluralism.[24] The expulsion of non-Christian religious minorities from Spain, especially the Jews in 1492 and the Moriscos in 1609 are examples of such destructive political entrepreneurship (Chaney and Hornbeck 2016).[25] Glaeser points out that pluralist institutions may depend on the cost of disseminating false racist narratives as opposed to the costs of verifying them. This is correct, but we should keep in mind the great danger of confirmation bias in these matters, which immunizes prejudiced people to evidence. Sadly, when it comes to racial hatred or religious bigotry, anything that could be regarded as factual evidence can be readily dismissed by those committed to an intolerant culture.
8. The absence of a neighboring nation in which the majority consists of people similar to the minority. One can think of many examples such as the poisoning of the relations between the Sudeten-Germans and the Czech majority by Germany after 1933, or the long-lasting and pernicious hostility between the Protestant and Catholic populations in Northern Ireland. The mechanism behind this empirical regularity could vary, and would be quite different between, say, Ulster and the Rohingyas in Myanmar.

24 To protect themselves against such entrepreneurs, successful minorities often display demonstrative loyalty to the government in power run by the in-group majority.

25 Another instance would be political scapegoatism, in which a minority is blamed for some misfortune that occurs in society that otherwise seems to defy explanation. The persecution of Jews after the Black Death is a well-documented example of such social scapegoatism.

These principles, then, indicate what to expect in terms of relations between a majority in- group and a minority outgroup as an example of the salutary effects of diversity. When it works well, it can create huge benefits for society as a whole. In Imperial Germany, Jews were legally emancipated despite widespread antisemitism. While much of the culture was still intolerant, the pluralist institutions were able to restrain the behavior of anti-Jewish elements in the population. The net result was that Jews in Imperial Germany punched above their weight in their contribution to the industrial, commercial, and scientific development of the nation. While their share in the population was about one percent in 1871 and about 0.8 percent in 1933, they were over-represented in every sector associated with modernization, industrialization, and advanced science and technology. According to the 1933 German Census, Jews in Germany comprised 16.25 percent of lawyers, 15.05 percent of brokerage agents and 10.88 percent of medical personnel (Warburg 1939: 30). This may not have amounted to the complete domination that Nazi propaganda screamed about, but it reflects the impact that pluralist policies had on Germany's development.[26] In the German banking sector, both smaller private banks and the larger universal banks, Jews had a very powerful presence.

An examination of a small subsample of the Jews who materially contributed to Imperial Germany's economic and scientific successes confirms their central role in German economic development. Among the most notable were Albert Ballin, the son of a Danish Jewish immigrant who built a hugely successful shipping business and pioneered pleasure cruises catering to wealthy customers. He was personally close to the German Emperor and one of the Jews close to the imperial court known as *Kaiserjuden*. Equally prominent was Emil Rathenau, who purchased the European rights to Edison's inventions and founded Allgemeine-Elektrizitäts-Gesellschaft (later known as AEG) in 1887. He became known as the "Bismarck of the German electric industry," the person who introduced electric light and trams to most German cities. His son Walther ran the German command economy during World War I and served as foreign minister in the early days of the Weimar Republic.[27] In retailing, a chain of department stores

26 Elon (2003, p. 6) notes that "In a relatively brief period [1870-1933], this small community [German Jews] produced a staggering array of entrepreneurs, artists, writers, wits, scholars, and radical political activists"

27 His contribution to the German war effort was remarkable: Elon (2003) pp. 314-315 notes that "In his eight months in this post, Rathenau established the first truly planned modern economy in Europe.

was established by Hermann Tietz (1837-1907) and his nephews. The vast and luxurious stores were a huge success and had 10 branches in Germany, employing 13,000 employees. The bankers Abraham von Oppenheim and Gerson von Bleichröder were the first Jews to be ennobled in Germany on account of their financial support in the expensive military and political maneuvers that led to the unification of Germany. Bleichröder was particularly close to Bismarck, despite the chancellor's rather explicit antisemitism and he was known as Bismarck's *Privatjude* (Elon 2003: 193).

In science and medicine, too, the contribution of Jews was way out of proportion, even if we leave out superstars such as Einstein and Freud. Perhaps the biggest contribution of all to the German nation was made by the chemist Fritz Haber, a fervent German nationalist, who famously perfected the nitrogen fixing process for which he won the Nobel Prize in chemistry, and with which he did Germany the doubtful favor of securing a supply of nitrates that allowed it to stay in the war for four and a half years rather than a few months. Equally accomplished was the biologist Paul Ehrlich who won the Nobel Prize in 1908 for laying the foundations of what is now known as immunology, as well as developing the first effective treatment of syphilis.

And yet, German Jews violated one of the principles enunciated by Jha that make pluralism work and diversity a blessing rather than a threat. Their skills were not strongly complementary to those of their gentile neighbors. They were good at activities that non-Jewish Germans were also good at. For every Emil Rathenau there was a Siemens and a Krupp and for every Tietz and Wertheim there were non-Jewish storeowners such as Rudolph Karstadt. In science, Einstein's success spurred the wrath and jealousy of non-Jewish competitors such as the physicist Philipp Lenard, who infamously dubbed Einstein's work as "Jewish physics." The culture of intolerance (that is antisemitism) was alive and well in Imperial and Weimar Germany, even as pluralism was still the law of the land. The rise of the Nazis constitutes a historical experiment insofar as it can be seen as an abrupt radical institutional change. Jewish assets were easily expropriated or bought at bargain basement prices by greedy Germans. The sharp turn of Germany from a nation of reluctant but effective pluralism to one of violent suppression

It is no exaggeration to say that, but for Rathenau and the gifted scientists, economists, and managers he engaged, Germany might have succumbed within months; its adversaries had greater stocks of food, minerals ... bullets, and open supply lines if stocks ran out."

of minorities demonstrates the fragility of pluralist institutions unless they rest on a firm cultural foundation of tolerance and willingness to co- exist with others.[28] It also shows how vulnerable pluralism is to demagogic political entrepreneurs who are willing to ride a wave of racism, exploiting the conscious and subconscious homophily that makes so many people uncomfortable with and suspicious of "others."

Again, we can see Kranzberg's Law in action. Much like the self-defeating religious bigotry of Louis XIV in the late seventeenth century, the Nazi racist policies were hugely harmful to Germany. Expelling the Jews, even if they were less than one percent of the population, drained a substantial proportion of Germany's upper-tail human capital, which was essential to its continued technological and scientific leadership.[29] In a series of brilliant papers, Fabian Waldinger has demonstrated that the loss of its intellectual elite in science and medicine left Germany permanently weakened. By his calculations, more than 1,000 academics were dismissed from German universities. This number included 15.0% of physicists, 14.1% of chemists, and 18.7% of mathematicians. It does not include the loss of other elite intellectuals from universities or top STEM workers employed by the government or the private sector. The loss of top Jewish scientists and physicians caused a large decline in research output. This loss was persistent, still noticeable as late as 1980. Waldinger (2013, p. 813) estimates the total loss of top-rated scientific publications to be around 34% in the disciplines of physics, chemistry, and mathematics.[30]

Another example of an even smaller minority punching considerably above its weight and creating a substantial social surplus for the majority is the dramatic history of the Parsi and Irani minorities in India. The Parsis are a small

28 Both the Kaiser and Bismarck, despite their friendship with some Jews and their reliance on support from wealthy and influential Jewish citizens, were demonstrably antisemitic. Wilhelm fell under the influence of the rabid English racist Houston Stewart Chamberlain, and even proposed making his works required reading in German Schools (Elon 2003: 267). Bismarck's ambivalent attitudes to Jews was equally obvious and open. At the Versailles peace conference he felt that his French counterparts must have been Jewish to judge from their physiognomy. "There was an insistent, harsh anti-Semitic tone at Versailles: at no other time in his life did Bismarck speak so often, so freely, so scathingly of the rootlessness of Jews, of their hustling, of their omnipresence" (Stern 1979: 146).

29 For an exposition of the concept of upper-tail human capital, see Mokyr (2009: 122) and Mokyr (2016: 121-126).

30 Strikingly, Waldinger shows that German science also suffered in the short term from the destruction of the physical plant and equipment due to allied bombing, but the loss of physical assets was less persistent and smaller than that of the upper-tail human capital due to the anti-pluralist institutions of the Nazi regime.

community of Zoroastrians mostly located in north-west India, the descendants of religious refugees who fled Iran (then Persia) after the Muslim conquest in the seventh century. According to traditional accounts, they were given refuge in Gujarat by a local prince on condition that they adopt the Hindu language and accept the customary marriage patterns (Kapoor 2021: 14). For centuries, the Parsi maintained their separate identity and practiced endogamy but lived in peace with their Hindu neighbors. With the arrival of Europeans, the Parsis perceived opportunities, and succeeded in benefiting economically from the Raj. As Karaka, (1884 vol. 2: 9) remarks, "either the Parsis had the knack of ingratiating themselves in the favour of the Europeans, or they were selected by them for their intelligence, business habits, and integrity."[31] By the nineteenth century, with the rise of Bombay, much of the trade between it and Europe was controlled by Parsi traders who also claimed a substantial share of trade with East Asia (Tripathi 2004: 76-82).[32]

In subsequent centuries, as Gandhi himself is supposed to have remarked, "in numbers the Parsis are beneath contempt, in contributions beyond compare" (cited by Kapoor 2021: 15). Despite a population estimated today at below 60,000, their contribution to the Indian economy, its politics, and its culture have been spectacular. As might be expected from a small and vulnerable but wealthy minority, they were remarkably loyal to their government (Karaka 1884, vol. 2: 50) and, consistent with the Jha principle No. 4, contributed a great deal to charity and public goods.[33] Among the most notable Parsis in India in the more recent past and present are two of the giants of nineteenth century manufacturing in India. Jamsetji Nusserwanji Tata (1839-1904) regarded as the legendary "Father of Indian Industry" and the founding patriarch of the notable Tata family.

31 One of the first Parsis to become a successful entrepreneur in the new colonial environment was Rustom Maneck (full name: Naoroji Rustomji Manek Seth) 1662-1732. He became the chief broker for the British East India Company in Surat, and represented its interest at the court of Emperor Aurangzeb in Delhi. After a dispute with his employer, one of his sons famously sailed to London, sued for an injustice, and won a huge settlement (Edulgee 2005-2023). The family subsequently built a fabulous ancestral mansion on top of Dongri Hill, situated to the west of Bombay Dock. The entire hill was bought by his family and renamed Naoroji Hill from where the best blue basalt available in Bombay was quarried.

32 Tripathi argues that "the Parsees possessed the knowledge of the land and its language, and being a small minority, it was relatively easy for them to deal with the foreigners with a certain measure of flexibility. Their minority status also gave them some advantage in mediating between different interests and political powers" (2004: 77).

33 For instance, Jamsetji Tata used half his fortune to found the Indian Institute of Science (IISc) in Bombay, which opened in 1911 and is still a major producer of top scientists in India (Kapoor 2021: 50-51).

He was so influential in the world of industry that Jawaharlal Nehru referred to Tata as a "One-Man Planning Commission." Equally prominent was the "Petit" family, founded by Manockji Petit (b. 1803) but brought to great prominence by Sir Dinshaw Maneckji Petit, 1st Baronet (1823–1901), the pioneer of the modern textile industry in India and equally known for extensive philanthropy. In shipbuilding, the Wadia family was equally prominent, beginning with Lovji Nusserwanjee Wadia (1702–1774), who founded his docks in 1736 and which survives till today as the Wadia group located in Mumbai (Karaka, 1884, vol. 2, pp. 60-76). Many of these dynasties are still counted among the most successful businesses in India, and they have been joined by new Parsi entrepreneurs, such as Cyrus Poonawalla, the owner and chair of the Serum Institute of India, the world's largest vaccine producer. Outside business, too, the Parsi have made a disproportional mark, including in music such as the conductor Zubin Mehta and the pop singer Freddie Mercury (né Farrokh Bulsara), science, such as two persons (unrelated) both named Homi Bhaba (one a noted nuclear scientist, the other a critical theorist), and in the military (General Sam Manekshaw, the hero of the war against Pakistan of 1971).

4. Lessons from History II: The Reformation and the Enlightenment

The Reformation in Europe provides an instructive example of the effects of diversity, in this case religious diversity. Medieval Europe had been a world of little religious diversity: the Catholic (or "Latin") church ruled supreme, and local "heresies" were mercilessly suppressed. Jewish settlements in the Christian world were self-contained, small, and under constant pressure, and the Muslim world was geographically and economically separate. The only diversity was within the Church (such as schisms) but its hierarchical structure limited such variations. All this changed dramatically with the Reformation. Unlike cases where "religious diversity" really was a proxy for ethnic or racial diversity, the Reformation in Europe constituted a severe shock to the low-diversity religious equilibrium, and for better or for worse, it rather abruptly created a new and much more diverse religious environment.

It might be added that religious diversity is an issue mostly when religion becomes something of an identity, with sharp boundaries between religions, so that a person belongs to one religion or another. Such a sharp demarcation is far

from natural. In China a number of religions co-existed peacefully largely because believing in Confucian morals did not constitute a Confucian identity. One scholar has noted that in China it was easy for any person to "observe Confucian ethics, pray to Buddha and hire a Daoist priest ...without being bothered by the inconsistencies of these teachings" (Zhao 2015: 342).[34]

What were the economic effects of this revolution? Clearly, for the first century after the Reformation, it is clear that religious diversity was mediated by antipluralist institutions, consistent with Kranzberg's Law. The principle of *cuius regio eius religio* formalized at the Peace of Augsburg in 1555 embodied the fundamental idea that "others" who did not share the religion of the ruler were not welcome. Germany (and Europe) was to be divided into Protestant and Catholic areas. That principle was never fully carried out on the ground, but it reflects the zeitgeist of religious intolerance in the middle of the sixteenth century. In 1562, the French Wars of Religion started with a massacre of Huguenots at Passy and were to last for thirty-six years. Elsewhere in Europe, too, massive violence between different brands of Christianity continued for many decades. These religious conflicts reached a crescendo of sorts with the 30-Years War in Germany with devastating results for the economies of Central Europe. Moreover, as recently shown by Cabello (2023), the Reformation and its direct consequence, the Catholic Counter-Reformation, had strongly deleterious effects on European science. The Catholic holy inquisition, the persecution of heretics, and the strong prohibitions on books and on travel to foreign universities depressed science in much of Europe south of the Alps. Here, too, institutions mattered: north of the Alps the harmful effects of religious strife were much less pronounced, in large part because of the fragmented and uncoordinated leadership of fanatical and benighted religious groups.

In short, the rise of religious diversity created a sharp rise in antipluralist institutions, with devastating human and economic consequences. Over time, European intellectuals and politicians, led by such clear-thinking writers as the French theologian Sebastian Castellio (1515-1563) began to recognize the cruelty and futility of religious intolerance. Castellio's most famous line in a book

34 One example is the noted Chinese intellectual Xu Guangqi (1562–1633) who, like many Chinese intellectuals, was also a high-ranking official in the Imperial administration. His close contacts with Jesuits persuaded him to convert to Christianity in 1603, and he was known henceforth as "Dr. Paul" — yet the conversion does not seem to have affected his political status. Such an outcome would have been unthinkable in Europe.

entitled *Should Heretics be Persecuted?* (1554) summarizes the idea of tolerance well: "When I reflect on what a heretic really is, I can find no other criterion than that we are all heretics in the eyes of those who do not share our views" (cited by Marshall 2006: 266). That Castellio's beliefs were a minority view in his own time is illustrated by the fact that after his death, Calvin's henchmen in Geneva dug up his remains and burned them and scattered his ashes.

Intolerance did not disappear magically with the 1648 Peace of Westfalia or the English Act of Toleration of 1689, not even in the most commercially advanced countries.[35] Tolerance of others was always qualified and conditional: even John Locke, a supporter of pluralism, was definite in his view that atheists are not to be tolerated since clearly "promises, covenants, and oaths, which are the bonds of human society, can have no hold upon an atheist." And yet, the worst aspects of religious bigotry were slowly vanishing in the second half of the seventeenth century.[36] Still, being "tolerated" was not the same as emancipation. Even the more pluralist institutions (formal and informal) of progressive western societies were still quite remote from being color/race/religion blind. In other words, the greater pluralism in much of enlightened eighteenth century Europe did not preclude serious discrimination against minority groups at many levels. In Great Britain, dissenters such as Unitarians and Catholics could live and practice their religion after the Act of Toleration, but were excluded from many spheres until the Emancipation Act of 1829.[37] Commerce and finance, where such discrimination was rare, prospered as a consequence.[38] All the same, even in Britain the move to a pluralist society was slow, uneven, and full of setbacks and retreats.[39] Profound prejudice remained deeply ensconced in British culture. In

35 The pluralism embodied in France in the Edict of Nantes of 1598 that gave Protestant the right to live in France and practice their religion in places was eventually reversed by the whims of the autocratic Louis XIV, revoking it in 1685, followed by the bloody suppression of the so-called Camisard rebellion of French Huguenots in 1703-04 in the south of France, leading to thousands of casualties and executions.

36 The last person executed for blasphemy in Great Britain was the Scottish student Thomas Aikenhead, hanged in 1697. Formally, the death penalty for blasphemy remained on the books until 1825. Pluralism, however, is not so much about the written de iure rules as they are about their de facto implementation and enforcement. Here reality could be a lot more pluralist than formal arrangements. Even after the expulsion of the Huguenots in 1685, in many small communities in France there was a de facto toleration of Protestants, depending on the attitude of the local Church officials (Linton 2000: 162).

37 Catholics were not formally mentioned in the Act of Toleration but de facto enjoyed its real effects (Robertson 2021: 103).

38 In a famous passage in his sixth letter *Regarding the English Nation,* Voltaire exclaimed that at the London Royal Exchange "the Jew, the Mohammedan and the Christian negotiate with one another as if they were all of the same religion, and the only heretics are those who declare bankruptcy."

39 A 1753 bill that would give Britain's Jews the right to be naturalized subject to a residence qualifica-

1788, the enlightened English intellectual Edward Gibbon, observing the anti-Catholic Gordon Riots of 1780, wrote that they reflected "a dark and diabolical fanaticism, which I had supposed to be extinct, but which actually subsists in Great Britain." Two generations later, John Stuart Mill in his *On Liberty* felt the same way.[40]

Europe embarked on a growing commitment to pluralism in the nineteenth century, but only a growing ideology of tolerance could constitute the solid cultural foundation of the legal and administrative reforms that established formal pluralism and gave religious minorities many rights beyond permission to simply reside and worship in a given country. The eighteenth-century Enlightenment, by and large, supplied that foundation. While the philosopher whose work we identify as enlightened disagreed on many issues, there seems to be wide consensus among them as to the desirability of a "live and let live" attitude that is, a culture of toleration and the pluralist institutions that came with it (Robertson 2021: 85-135).[41] This is not to say that there were no important differences between Enlightenment intellectuals on this matter or that their support for pluralism was unqualified or entirely driven by ethics as opposed to pragmatism. Yet in the end there seems little to disagree with Grell and Porter (2000:19) when they summarize the history of tolerance in Europe by declaring that "it was the thinkers of the Enlightenment who most clearly voiced those arguments for toleration, in all their strengths and weaknesses, which continue to envelop us in our present multicultural and multireligious societies. Here, as in so many other ways, we are the children of the Enlightenment."

The importance of the Enlightenment for long-term economic development has long been underestimated, but today there are signs that its impact is being recognized (Mokyr 2005; Squicciarini and Voigtländer 2015). The mecha-

tion and the evidence of two supporting witnesses,'without receiving the Sacrament of the Lord's Supper' had to be withdrawn after furious opposition by bigoted Tories who felt it threatened the essence of a Christian Nation and indicates that pluralism had to tread cautiously because it remained contested deep in the age of Enlightenment (Champion 2000: 139).

40 "Yet so natural to mankind is intolerance in whatever they really care about, that religious freedom has hardly anywhere been practically realized, except where religious indifference, which dislikes to have its peace disturbed by theological quarrels, has added its weight to the scale. In the minds of almost all religious persons, even in the most tolerant countries, the duty of toleration is admitted with tacit reserves... Wherever the sentiment of the majority is still genuine and intense, it is found to have abated little of its claim to be obeyed." Mill [1859] 2011:14.

41 For instance, the Prussian toleration edict of 1788 provided equal status to all Christian religions, followed by guaranteeing the principles of the freedom of conscience in 1794 (Cinnirella and Streb 2017: 9).

nisms through which an elite cultural movement could affect economic outcomes are varied. However, an emphasis on pluralism and on a more tolerant attitude toward the publication of innovative material — no matter how disturbing to those committed to the conventional wisdom — can already be seen in the late seventeenth century with the "radical" writings of John Toland. Toland roundly condemned all forms of institutionalized Christianity in his 1696 book *Christianity not Mysterious*.[42] On the Continent, Pierre Bayle argued strenuously that a society of atheists could live a virtuous existence by honor and civility and did not need religion to keep people from misbehaving (Grell and Porter 2000: 8). While roundly condemned by pious intellectuals, neither Toland nor Bayle, nor the most influential heretic of the seventeenth century, Spinoza, were ever physically harmed despite threats of violence and repeated needs to relocate. As the Enlightenment progressed, such threats of violence became rarer, although discrimination against heretics and their writings was still common.

What were the economic effects of pluralism? A comparison between Britain and France and their different levels of pluralism is instructive. The role of dissenters and religious minorities in the British Industrial Revolution has been well documented (Mokyr 2009: 361-63). Excluded from many career paths and the major universities, dissenters created their own educational institutions and many of them specialized in high-end artisanal occupations and commerce. In France, the bigoted Catholicism of Louis XIV in his later years led to the migration of some of the most skilled and productive members of the upper tail of the human capital distribution in France, among them Denis Papin, Abraham De Moivre, and John T. Desaguliers, who all found a home in Britain. Much of the clock- and watchmaking industry in France's neighbors originated with immigrants fleeing religious bigotry (Landes 1983: 219). The favorable treatment of Huguenots in Prussia was demonstrated in a famous paper by Erik Hornung (2014). Similar phenomena can be observed in the Dutch United Provinces. Pluralism, no matter how incomplete, was a powerful tool in the competitive world of states in this era, and the migration of the footloose educated and skilled classes implied that any state whose anti-pluralist policies were dictated by intolerance would pay a high price. A correlation between diversity at the local level (such as cities) and techno-

42 A century later, radical tolerance in the West had evolved; Thomas Paine famously wrote that "Toleration is not the opposite of intolerance but is the counterfeit of it. Both are despotisms. The one assumes to itself the right of withholding Liberty of Conscience and the other of granting it...The former is church and state, and the latter is church and traffic" (Paine [1791] 2017: 272).

logical creativity creates a problem of identification. It is possible that pluralism is a part of a larger complex of enlightened institutions that encourages *both* diversity and technological progress, and that hence a clean *causal* connection between diversity and patents is not demonstrated. Benighted institutions such as the ones in southern Europe as argued for by Cabello (2023) would be the mirror image of that association.

5. Religious Pluralism and economic growth in Europe after 1500

The paradigmatic example of a tolerant culture leading to (relatively) pluralist institutions and from there to economic prosperity is the Netherlands in the Golden Age. Again, by modern standards, this was hardly an exemplary pluralist society. Many cities had strict prohibitions on the residence of people (many of them Protestants) who did not belong to the dominant Calvinist Church. The Dutch prominent liberal and pro-pluralist intellectual Dirck Coornhert (1522-1590) was born and remained a Catholic all his life, and had to move repeatedly to escape intolerant cities, until he settled in Gouda in 1588, at that time a relatively pluralist city. Pluralism in the Netherlands was a matter of geography (Israel 1995: 640-645). In Utrecht, for example, Jews could not stay overnight until 1789 and had to live in Maarssen, a good two hours walking away. Again, however, formal regulations and the actual practice on the ground may have diverged. The pre-eminent historian of Dutch tolerance has argued that authorities often turned a blind eye to violations of residency limitations and other constraints on minorities and concludes that "religious dissenters, however, enjoyed a de facto tolerance that made Dutch society religiously the most diverse and pluralistic in seventeenth-century Europe" (Kaplan 2010: 174). Non-Calvinists may have been barred from public office, but they could worship in so-called *schuilkerken* (illicit churches) and while they were at times subject to harassment, by and large people got along.

The Dutch Golden Age is a classic example of how capitalism and pluralism went hand-in- hand. It would be no exaggeration to say that in capitalist Netherlands in its Golden Age, religious diversity was a feature, not a bug of society.[43] Pluralism,

43 Consider the impressions of Colonel Jean-Baptiste Stouppe, a transnational adventurer, spy, and gun-for-hire, who joined Louis XIV's invading army in 1672 and wrote a well-known tract entitled The Religion of the Dutch (Stouppe 1681: 14) in which he described in detail the dazzling array of different religions that he observed the public exercise of: "besides those of the reformed (Calvinist) church, we

it turned out, was profitable. Local authorities were encouraged in their permissive attitudes toward other religions by substantial bribes for their connivance in semi-public rituals and quite overt houses of worship (Frijhoff 2002: 45). To be sure, because of the uneven nature of pluralism in the Dutch Republic, some scholars have objected to the widespread description of contemporaries of the Netherlands as a model of tolerance. Yet it was precisely the decentralization of political power that made pluralism possible. Decentralized, polycentric government is typically more likely to be tolerant and diverse, simply because of coordination failures. More powerful autocrats like Ferdinand-Isabella, Louis XIV, or Czar Alexander III could carry out major acts of intolerance (at high cost). In the Netherlands this would have been far more difficult, as local and provincial authorities would have had to coordinate their repressive policies.

In that sense, the Dutch Republic may be regarded as a miniature example of the political fragmentation argument, recently re-stated by Walter Scheidel in his *Escape from Rome*. In Europe, suppressing technological and intellectual innovation of any kind --- including religion --- was difficult simply because reactionary powers usually found it difficult to coordinate and because there were always local niches in which more tolerant rulers were willing to accept "apostates." Clever heterodox thinkers and religious skeptics inhabited the seams of Europe and skillfully played the states against one another.

The more difficult question is whether this pluralism actually was a significant positive factor in the "embarrassment of riches" of the Dutch Golden Age. Clearly, some contemporaries thought so, none more than the early political economist Pieter de la Court (1618-1685), who pointed out in his famous *Interests of Holland* that the Dutch economy depended on emigrants, and that religious pluralism "hath brought in many inhabitants and driven out but a few" (De la Court [1662] 1746: 68; Israel 1995: 786). As an urban society, the Holland provinces required the constant infusion of immigrants on account of the high mortality rates in cities.[44] There is, however, little evidence that religious diversity *as such*

find Roman Catholics, Lutherans, Brownists, Independents, Arminians, Anabaptists, Socinians, Arrians, Enthusiasts, Quakers, Borrelists, Armenians, Muscovites, Libertines" not to mention Jews, Turks, and Persians "in regards that they are not Christians."

44 Frijhoff (2002: 28) has noted that the organic connection between religious toleration and commercial prosperity was established as early as 1651 in Jean-Nicolas de Parival's *Les Délices de la Hollande*, a best-selling book translated into many languages. The commercial benefits of toleration became a cliché, "often repeated by later travellers, from Basnage to Montesquieu, from the Marquis d'Argenson to Voltaire and Diderot, even while Dutch prosperity was undergoing serious and lasting setbacks". In his *Polit-*

contributed to its prosperity, and it was not able to prevent the economic decline of the Netherlands in the later eighteenth century. It seems more plausible that *both* pluralism and economic success were the result of a more rationalist and capitalist culture that emerged in the Netherlands in medieval times and that even the most benighted Calvinist fanatics could not suppress (Prak and Van Zanden 2023: 113-115). Dutch capitalism meant that profits trumped bigotry.[45] While the Dutch Republic in its heyday was hardly a democratic society by modern definitions, it was clearly an example of early capitalism, and its pluralism was a telltale sign of a nation that was ready for enlightenment ideology; democracy would follow eventually. While early capitalism provided the Dutch with a material motive for tolerance, the enlightenment added a moral base for it. In 1796, Dutch Jews were emancipated by the (French-dominated) Batavic Republic.

Did British pluralism contribute to its Industrial Revolution? As noted, for many years after the Glorious Revolution religious minorities were still not considered part of the establishment that ran the country, but for that reason their human capital and energy were channeled into commercial and industrial activities. Scholars have long stressed the high proportion of dissenters among the most successful entrepreneurs and innovators in the Industrial Revolution. A particularly good example were Quakers. The most famous of them were the Darbys of Coalbrookdale in Shropshire, who famously pioneered the use of coke in iron smelting. In late eighteenth-century Birmingham, Quakers made up 1 percent of the town's population but one-third of its ironmasters and tanners (Jones 2008: 177).[46] Another group of dissenters who punched above their weight in the Industrial Revolution were Unitarians.[47] Much like other minority groups in other

ical Arithmetic, William Petty similarly felt that "trade is most vigorously carried on ... by the heterodox part of the [nation] and such as profess opinions different from what is publickly established" ([1690] 1755: 118-119).

45 Peter Stuyvesant, the intolerant Dutch governor of New Amsterdam asked in 1665 for permission from the West India Company to kick out the few Jews that had settled thereafter having fled the Portuguese settlement of Recife in Brazil. The governors wrote back coolly that such as request would be "unreasonable and unfair, especially because of the considerable loss sustained by this nation, with others" (Oppenheim 1909: 8).

46 It is striking that Quakers were also among the most tolerant of dissenters and at the vanguard of the abolitionist movement in late eighteenth-century Britain.

47 Margaret Jacob (2000: 278) has stressed the importance of unitarianism in the eighteenth century British economy. Three of the most prominent figures of the Industrial Revolution, James Watt, Josiah Wedgwood and Joseph Priestley were unitarians, as were many others. Jacob summarizes the impact of this dissenting creed as offering "the conviction that a rational God — and not Calvin's inscrutable and judgmental one — would reward and replenish."

pluralist societies, dissenters felt that they could trust their co-religionists more than others, which gave them an advantage in networked occupations in which trust was important. In this regard, homophily may have had its upside.

The other salutary effect of British pluralism was in education. Since non-Anglicans were excluded from the universities, they founded their own schools, known as dissenting academies. Many of the most prominent figures of the Industrial Revolution were educated at these academies, including the prominent ironmongers the Wilkinson brothers, and the chemists Joseph Priestley and John Dalton. These schools emphasized an experimental and pragmatic approach to science and mathematics, and their impact was a major reason why nonconformists played a disproportionate role in British entrepreneurship in the eighteenth century. Their graduates typically ended up in commerce, medicine, and industry.

6. Competition and Pluralism

The Dutch example illustrates an important element in European history that no-doubt played a role in the rise of religious pluralism, namely that internal competition in polycentric and decentralized political units is usually a salutary factor in the history of diversity. This is true even in the United States today, in which individuals who value a particular ideology have the option to settle anywhere they wish and thus vote with their feet. The Dutch Republic, despite its modest size, had a great deal of internal heterogeneity, which allowed minorities to pick and choose their location. What was true for the Netherlands was true for Europe as a whole. The competition did what it was supposed to do: antipluralist states such as France under Louis XIV eventually had no choice but to relent in their bigoted policies. In the eighteenth century after the death of Louis XIV, the persecution of Huguenots declined and some of them returned to France (one of them was the banker Jacques Necker, director-general of the finances of the Kingdom under Louis XVI). In 1787, just before the Revolution, Louis XVI signed the Edict of Versailles which legitimized de jure certain civil rights for the Huguenots, even if it still denied them public worship and any political rights. A few years later the new revolutionary government officially invited them to return to France with full citizenship rights.

The other salutary effect of the Reformation and the competition among religions was that with the loss of the Latin Church's monopoly position in the European market for ideas, religions had to compete. As already noted, in any

market — including the market for ideas — competition is a salutary force if the competitors stick to agreed-upon rules that keep the competition civilized. Over time, the struggle between religions in Europe moved from violence to more productive channels. Much scholarly and educational work was undertaken for the purpose of demonstrating the superiority of and securing converts for a branch of the now divided Western Christianity (Grafton 2009: 11). The most important of those channels was education: Protestants such as Philipp Melanchton realized from the outset that education was a key to their success. One way the Catholic camp tried to fend off the threat of Protestants was to establish their own schooling system, primarily through Jesuit Schools. Whether this was a successful tactic to defend Catholicism remains to be seen, but clearly the Jesuits made a substantial contribution to the accumulation of human capital world-wide.[48] The Protestants responded by setting up their own schools, the most famous of which were the above mentioned English dissenting academies (Stone 1969). In a recent paper, Xiong and Zhao (2022) show that religious diversity and competition in the nineteenth century US led to a proliferation of Colleges, and thus laid the foundation for the American system of higher education. A back-of-the-envelope calculation suggests that there would have been approximately 22 percent fewer colleges by 1890 if the US had been dominated by a single denomination.[49] As long as pluralist institutions can mediate the competition and antipathy between rival religions and prevent them from reverting to violent conflicts, it can exploit the diversity and lead to significant economic improvements.

7. Conclusions

Today's realities seem to be consistent with the notion that a high rate of diversity is economically beneficial when it is coupled to pluralist and enlightened institutions but can be devastating when it is not. Some highly diverse nations have clearly paid a price for their ethnic or linguistic diversity with no obvious

48 A striking example of the impact of Jesuit education on long-term economic welfare is provided by Valencia (2019) who shows that in the area of the Guaraní in South America, Jesuit education had a significant salutary effect.

49 Their conclusion is worth quoting: "The 'knowledge' industry remains, to this day, a key feature of 'American Exceptionalism'. US universities dominate global rankings: its top private research universities accumulate considerable wealth, attract talented students and faculty from abroad, and set the world's highest academic standards. This productive system is in part a consequence of unique circumstances in the 19th century: the absence of state-sponsored religion and the proliferation of Christian denominations."

benefits. Ethiopia has more than 80 different ethnicities with anywhere between 77 and 92 languages spoken. Myanmar has 135 distinct ethnic groups grouped into eight "major national ethnic races." Has diversity been good for those "low institutional quality" countries? At the same time, it is equally clear that in some countries diversity is beneficial for the economy, provided they are firmly based on a pluralist culture of live and let live, even if perhaps not much love is lost between the different groups, as for example the Flemish and French speaking populations in Belgium or Francophone and Anglophone Canada. Perhaps the most underrated institution that makes diversity a success is the option of voluntary segregation, an application of Robert Frost's famous dictum that tall fences make good neighbors.

All the same, the Page-Florida notion that mixing different ethnic and linguistic groups can stimulate creativity has merit when the institutional environment is favorable. In some countries, diversity seems demonstrably a net blessing even if there were substantial costs. Israel, for instance, is one of the world's most ethnically, linguistically, culturally, and religiously diverse countries, despite the common denominator of Jewishness. It is also one of the most creative countries, performing considerably above its proportional size in information technology, medicine, biotech, agricultural, and hydraulic technologies, to name but a few. It also has a rich and complex cuisine, a magnificent music scene (both popular and classical), and a highly original literary and theatre industry. Israeli culture is what syncretism is all about: creating "fusions" of diverse cultural traits, creating new entities by recombining and hybridizing ideas from different cultures. The modern Hebrew language, similarly, is a synthesis of many languages, giving it an uncommon power and flexibility. Senor and Singer (2009: 17) single out Israel as "among the most heterogeneous in the world. Israel's tiny population is made up of some seventy different nationalities" which they credit with its hugely successful high-tech sector.[50] There is no doubt that the influx of Eastern European immigrants carrying a large amount of human capital in the late twentieth century sharply increased both diversity and creativity. In 2018, Israel

50 As the Irish economist and journalist David McWilliams explained in 2004, "Israel is quite the opposite of a uni-dimensional Jewish country … It is a monotheistic melting pot of a diaspora that brought back with it the culture, language and customs of the four corners of the earth… Worldwide, you can tell how diverse the population is by the food smells of the streets and the choice of menus. In Israel, you can eat almost any specialty, from Yemenite to Russian, from real Mediterranean to bagels. Immigrants cook and that is precisely what wave after wave of poor Jews did when they arrived having been kicked out of Baghdad, Berlin, and Bosnia."

was second only to Taiwan in patents per capita (Rayome 2018). In 2022, its high-tech sector accounted for 54 percent of total exports and employed close to 10 percent of the labor force. Israel spent more on R&D than any other member of OECD, 5.4 percent of GDP (Jeffay 2022). All the same, the costs of Israeli diversity are just as salient, as the country's increasingly dysfunctional political system and unending conflicts with its non-Jewish population attest.

Another contemporary example of pluralism paying off to the economy is Singapore. Singapore is also quite diverse, with its population being a mixture of Chinese (74 percent), Malay (14 percent), and South Indian (9 percent) origin. It has no fewer that four official languages (English, Mandarin, Malay, and Tamil). It leaves nothing to chance: there is a government enforced ethnic integration policy known as EIP ("Ethnic Integration Policy"). The pluralist policies of Lee Kuan Yew were aimed at ethnic pacification, and were on balance a success even if they meant the curbing of some individual freedoms. The EIP was introduced in 1989 to counter the emergence of ethnic enclaves. The four categories of racial groups: Chinese, Malay and Indian and "others"are allocated into apartment buildings according to quotas set by the EIP. Having most citizens in public housing allows the government to exercise a large degree of control over their social dynamics. The EIP is perhaps the most visible sign of this control (Badalge 2020). But Singapore's government policy, best described as aggressive pluralism, is extended to education and employment as well.[51]

The Singaporean experience suggests above all that there is more than one path to pluralism. It is clear that forceful top-down policies can make a difference here. The Singapore government conceptualized the relationship between the different ethnic groups as four overlapping communities arranged as partially overlapping circles that maximized common ground but retains each race's separate identity (Alviar-Matin and Ho 2010: 129). When institutions are sufficiently strong to enforce an overall pluralist policy of peaceful and reasonably-harmonious co-existence, the consequences are economic prosperity. Singapore's GDP per

51 Public schools in Singapore place great emphasis on developing a common national identity but remain "studiedly neutral" with regard to the promotion of group identities. The Singapore social studies curriculum emphasizes the promotion of a common citizen identity while assigning cultural and religious identities to the private sphere. In order to promote "social cohesion within a diverse society" and to ensure the survival of the nation-state, the Singapore government gives great emphasis to multicultural issues in the social studies curriculum and officially declarers that a primary aim of the subject is to develop "citizens who have empathy towards others and will participate responsibly and sensibly in a multi-ethnic, multi-cultural and multi-religious society" (Alviar-Martin and Ho 2010).

capita in 2021 was 106,000 (right after Luxemburg, using PPP for comparison). It ranked seventh on the 2022 WIPO's Global Innovation Index (Israel ranked sixteenth).

None of this is to suggest that diversity is a necessary condition for economic success any more than any other part of the cluster of democratic institutions. Some of the most successful economies, such as the Scandinavian countries, South Korea, and Japan display little diversity. On the basis of either economic history or contemporary experience, it remains hard to argue that diversity in *any* dimension is a *major* (much less an *essential*) factor in any aspect of economic performance. The direction of its effect on the economy, moreover, depends on the quality of institutions. Perhaps this argues once again for a primary role for institutions in economic development, which seems to be a conclusion that much of the professions seems to gravitate towards.

References

Abatli, Cemal Eren, Quamrul Ashraf, Oded Galor, and Mark Klemp. 2020. "Diversity and Conflict." *Econometrica* 88(2): 727-797.

Alesina, Alberto and Eliana La Ferrara. 2005. "Ethnic Diversity and Economic Performance." *Journal of Economic Literature* 43: 62-800.

Alesina, Alberto, Arnaud Devleeschauwer, William Easterly, Sergio Kurlat, and Romain Wacziarg, "Fractionalization." 2003. *Journal of Economic Growth* 8(2):155-194

Alesina, Alberto and Paola Giuliano. 2015. "Culture and Institutions." *Journal of Economic Literature* 53(4): 898-944.

Alviar-Martin, Theresa and Li-Ching Ho. 2011. "So, where do they fit in?" Teachers' perspectives of Multi-cultural Education and Diversity in Singapore." *Teaching and Teacher Education* 27: 127-135.

Badalge, Keshia Naurana. 2020. "The Country Where Diversity Is Enforced by Law." *We Are Not Divided*, Oct. 22, 2020. https://wearenotdivided.reasonstobecheerful.world/the-country-where-diversity-is-enforced-by-law/

Becker, Sascha O. and Luigi Pascali, 2019. "Religion, Division of Labor and Conflict: Anti-semitism in German Regions over 600 Years."*American Economic Review* 109(5): 1764–1804.

Besley, Timothy and Torsten Persson. 2011. *Pillars of Prosperity: The Political Economics of Development Clusters.*

Princeton: Princeton University Press.

Botticini, Maristella. 2000. "A Tale of "Benevolent" Governments: Private Credit Markets, Public Finance,

and the Role of Jewish Lenders in Medieval and Renaissance Italy." *Journal of Economic History* 60(1) 164-189.

Cabello, Matías."The Counter-Reformation, Science, and Long-Term Growth: A Black Legend?" Unpublished Working Paper, Martin Luther University, Sept. 2023.

Champion, Justin. 2000. "Toleration and Citizenship in Enlightenment England: John Toland and the Naturalization of the Jews, 1714–1753." In Ole Peter Grell and Roy Porter, eds., *Toleration in Enlightenment Europe*. Cambridge Cambridge University Press, pp. 133-156.

Chaney, Eric and Richard Hornbeck. 2016. "Economic Dynamics in the Malthusian Era: Evidence from the 1609 Spanish Expulsion of the Moriscos." *Economic Journal* 126(594): 1404-1440.

Christakis, Nicholas. 2019. *Blueprint: the Evolutionary Origins of a Good Society*. New York: Little, Brown Spark.

Cinnirella, Francesco and Jochen Streb. 2017. "Religious Tolerance as Engine of Innovation." CESifo Working Paper, No. 6797, Center for Economic Studies and IFO Institute (CESifo), Munich.

Cosgel, Metin M., Thomas J. Miceli, and Sadullah Yildirim. 2023. "Religion, Rulers, and Conflict." *Journal of Economic Growth* 28: 439–480

Das Neves, João César and Melé, Domènec. 2013. "Managing Ethically Cultural Diversity: Learning from Thomas Aquinas". *Journal of Business Ethics* 116(4): 769-78.

De la Court, Pieter [1662] 1746. *The True Interests and Political Maxims of the Province of Holland*, John Campbell, transl. London: printed for J. Nourse.

Easterly, William, and Ross Levine. 1997. "Africa's Growth Tragedy: Policies and Ethnic Divisions." *Quarterly Journal of Economics* 111(4): 1203-1250.

Elon, Amos. 2003. *The Pity of it All: A Portrait of the German Jewish Epoch, 1743-1933*. New York: Picador. Enke, Benjamin. 2023. "Moral Boundaries." NBER working paper 31701.

Fearon, James D. and David D. Laitin. 2003. "Ethnicity, Insurgency, and Civil War." *American Political Science Review*

97(1): 75-90.

Florida, Richard. 2012. *The Rise of the Creative Class revisited*. New York: Basic Books.

Frijhoff, Willem. 2002. "Religious Toleration in the United Provinces: from 'case' to 'model.'" In R. Po-Chia Hsia and Henk van Nierop eds., *Calvinism and Religious Toleration in the Dutch Golden Age*. Cambridge: Cambridge University Press, pp. 27-52.

Fu, Feng, Martin A. Nowak, Nicholas A. Christakis & James H. Fowler. 2012. "The Evolution of Homophily"

Scientific Reports 2(845).

Gelfand, Michele. 2018. *Rule Makers, Rule Breakers: Tight and Loose Cultures and the Secret Signals That Direct Our Lives*. New York: Scribner.

Glaeser, Edward L. 2005. "The Political Economy of Hatred." *Quarterly Journal of Economics* 120(1): 45-86.

Gordon, Robert J. 2016. *The Rise and Fall of American Growth*. Princeton: Princeton University Press.

Grafton, Anthony. 2009. "A Sketch Map of a Lost Continent: the Republic of Letters." *The Republic of Letters: a Journal for the Study of Knowledge, Politics, and the Arts,* Vol. 1, No. 1, pp. 1–18. Reprinted in *Worlds Made by Words: Scholarship and Community in the Modern West.* Cambridge, MA: Harvard University Press, pp. 9–34.

Greif, Avner. 2005. *Institutions and the Path to the Modern Economy: Lessons from Medieval Trade*. Cambridge: Cambridge University Press.

Grell, Ole Peter and Roy Porter. 2000. "Toleration in Enlightenment Europe." In Ole Peter Grell and Roy Porter, eds.,

Toleration in Enlightenment Europe. Cambridge Cambridge University Press, pp. 1-22.

Gupta, Bishnupriya, Dilip Mookherjee, Kaivan Munshi, and Mario Sanclemente. 2022. "Community Origins of Industrial Entrepreneurship in Colonial India." *Journal of development economics* 159: 1-19.

Hornung, E., 2014 "Immigration and the Diffusion of Technology: The Huguenot Diaspora in Prussia." *American Economic Review* 104(1): 84–122.

Israel, Jonathan. 1995. *The Dutch Republic: its Rise, Greatness and Fall, 1477-1806.* Oxford: the Clarendon Press.

Jacob, Margaret C. 2000. "Commerce, Industry, and the Laws of Newtonian Science: Weber Revisited and Revised." *Canadian Journal of History* 35(2): 275–92.

Jeffay, John. 2022. "Israeli high-tech dominant export industry, but investment needed." *Israel21c*, May 12. https://www.israel21c.org/israeli-high-tech-becomes-dominant-export-industry-but-uncertainty-looms/

Jha, Saumitra. 2013. "Trade, Institutions and Religious Tolerance: Evidence from South Asia." *American Political Science Review* 107(4): 806-32.

Jones, Peter M. 2008. *Industrial Enlightenment: Science, Technology, and Culture in Birmingham and the West Midlands, 1760–1820*. Manchester and New York: Manchester University Press.

Kaplan, Benjamin. 2002. "Dutch Religious Tolerance: Celebration and Revision." In R. Po-Chia Hsia and

Henk van Nierop eds., *Calvinism and Religious Toleration in the Dutch Golden Age*. Cambridge: Cambridge University Press, pp. 8-26.

Kaplan, Benjamin. 2010. *Divided by Faith: Religious Conflict and the Practice of Toleration in Early Modern Europe*. Cambridge, MA: Harvard University Press.

Kapoor, Coomi. 2021. *The Tatas, Freddie Mercury, and other Bawas: an Intimate History of the Parsis.* Chennai: Westland Nonfiction.

Karaka, Dosabhai Framji. 1884. *History of the Parsis: Including their Manners, Customs, Religion and Current Position.*

London: Macmillan.

Kranzberg, Melvin. 1986. "Technology and History: 'Kranzberg's Laws'" *Technology and Culture* 27(3): 544-560.

Landes, David S. 1983. *Revolution in Time: Clocks and the Making of the Modern World*. Cambridge, Mass.: Harvard University Press.

Linton, Marissa. 2000. "Citizenship and Religious Toleration in France." In Ole Peter Grell and Roy Porter, eds.,

Toleration in Enlightenment Europe. Cambridge Cambridge University Press, pp. 157-174.

Marshall, John. 2006. "Defining and Redefining Heresy up to Locke's *Letters Concerning Toleration.*" In David Loewenstein and John Marshall, eds., *Heresy, Literature, and Politics in Early Modern English Culture*. Cambridge: Cambridge University Press, pp. 254-281.

Menyhert, Balint. 2016. "Economic Growth spurred by Diversity: Central Europe at the turn of the 20th century." Unpublished, presented to the 22nd Dubrovnik Economic Conference.

McWilliams, David. 2004. "We're all Israelis Now." http://davidmcwilliams.ie/were-all-israelis-now/

Mill, John Stuart. ([1859] 2011). *On Liberty: The Project Gutenberg EBook of On Liberty*. https://www.gutenberg.org/files /34901/34901-h/34901-h.htm

Montalvo José G. and Marta Reynal-Querol. 2005. "Ethnic Polarization, Potential Conflict, and Civil Wars." *American Economic Review* 95(3): 796-816.

Mokyr, Joel. 2005. "The Intellectual Origins of Modern Economic Growth." [Presidential address]. *Journal of Economic History* 65(2): 285–351.

Mokyr, Joel. 2009. *The Enlightened Economy*. New York and London: Yale University Press.

Mokyr, Joel. 2016. *A Culture of Growth: Origins of the Modern Economy*. Princeton: Princeton University Press.

Mokyr, Joel. 2024. "Diversity, Pluralism and Tolerance: The Roots of Economic Progress?" In Scott Miller, ed., *Capitalism and Democracy*, forthcoming.

Oppenheim, Samuel. 1909. *The Early History of the Jews in New York*. New York: Printed for the Author and the American Jewish Historical Society.

Page, Scott. 2007. *The Difference: How the Power of Diversity Creates Better Groups, Firms, Schools, and Societies*, Princeton: Princeton University Press.

Paine, Thomas [1791] 2019. *The Rights of Man.* Minneapolis, First Avenue Editions. https://books.google.co.il/books?id=MVF_DwAAQBAJ&pg=PT22-4&lpg=PT224&dq

Petrovsky-Shtern, Yohanan. 2015. *The Golden Age Shtetl: A New History of Jewish Life in East Europe.* Princeton: Princeton University Press.

Petty, William [1690]. 1755. *Several Essays in Political Arithmetick*. 4th edition. London: Printed for D. Brown.

Posch, Max. 2023. "Cultural Change: Evidence from Three Centuries of U.S. Local Newspapers." Unpublished paper, presented to the Workshop on Kinship, Historical Psychology and European Medieval Development, October 6, 2023.

Prak, Maarten and Jan Luiten van Zanden. 2023. *Pioneers of Capitalism*: *the Netherlands 1000-1800.* Princeton: Princeton University Press.

Rayome, Alison DeNisco. 2018. "The 10 most innovative countries in the World." *TechRepublic,* Sept. 11. https://www.techrepublic.com/article/the-10-most-innovative-countries-in-the-world/

Robertson, Ritchie. 2021. *The Enlightenment: the Pursuit of Happiness, 1680-1790.* New York: Harper and Row.

Rock, David, Heidi Grant and Jacqui Grey. 2016. "Diverse Teams Feel Less Comfortable." *Harvard Business Review* 95(9): 22-28.

Scanlon, Thomas M. 2003. "The Difficulty of Tolerance." In T.M. Scanlon, *The Difficulty of Tolerance: Essays in Political Philosophy.* Cambridge, MA: Harvard University Press, pp. 187-200.

Senor, Dan and Saul Singer. 2009. *Start-up nation: the Story of Israel's Economic Miracle.* New York: Twelve. Slezkine, Yuri. ([2004], 2019). *The Jewish Century*. Princeton: Princeton University Press.

Squicciarini, Mara P., and Nico Voigtländer. 2015. "Human Capital and Industrialization: Evidence from the Age of Enlightenment." *Quarterly Journal of Economics* 130(4): 1825–83.

Stahl, Günter K., Martha L. Maznevski, Andreas Voigt, and Karsten Jonsen . 2010. "Unraveling the Effects of Cultural Diversity in Teams: A Meta-a K Snalysis of research on Multicultural Work Groups." *Journal of International Business Studies* 41(4): 690–709.

Stahl, Günter K. and Martha L. Maznevski. 2021. "Unraveling the Effects of Cultural Diversity in Teams: A Retrospective of research on Multicultural Groups and an Agenda for future Research." *Journal of International Business Studies* 52: 4–22.

Stern, Fritz. 1979. *Gold and Iron: Bismarck, Bleichröder, and the Building of the German Empire.* New York: Vintage Books.

Stone, Lawrence. 1969. "Literacy and Education in England 1640–1900." *Past & Present* 42: 69–139.

Stouppe, Jean-Baptiste. 1681. *The Religion of the Dutch*. Translated from the French by J.D. of Kidwelly. London: Printed for Samuel Heyrick.

Tripathi, Dwijendra. 2004. *The Oxford History of Indian Business.* New Delhi: Oxford University Press.

Valencia, Felipe. 2019. "The Mission: Human Capital Transmission, Economic Persistence and Culture in South America," *The Quarterly Journal of Economics* 134(1): 507-556.

Voigtländer, Nico and Hans-Joachim Voth. 2015. "Nazi indoctrination and anti-Semitic beliefs in Germany." *PNAS* June 30, 2015 112 (26) 7931-7936; https://doi.org/10.1073/ pnas. 1414822112

Waldinger, Fabian. 2013. "Bombs, Brains, and Science: the Role of Human and Physical Capital for the creation of Scientific Knowledge." *Review of Economics and Statistics* 98(5): 811-831.

Warburg, G. 1939. *Six Years of Hitler: The Jews under the Nazi Regime*. London: Allen and Unwin.

Xiong, Heyu and Yiling Zhao. 2023. ""Sectarian Competition and the Market Provision of Human Capital." *Journal of Economic History* 83(1): 1-4.

Zagorin, Perez. 2003. *How the Idea of Religious Toleration Came to the West*. Princeton, NJ: Princeton University Press.

Zhao, Dingxin. 2015. *The Confucian-Legalist State: A New Theory of Chinese History*. Oxford: Oxford University Press.

How Did the World Become Rich?

Jared Rubin[1]

1. Introduction

Understanding how the world became rich is one of the great endeavors in economics. It is the reason I became an economist and an economic historian. Few economists have done more to improve our understanding of this issue than Joel Mokyr.

Economists by and large take it for granted that understanding the modern economic takeoff—why it occurred when and where it did, why some countries followed, and others were left behind—requires an understanding of *technology and technological progress*. Why have some countries been so technologically progressive? Why have others been so adept at adopting technology? Why have others found it so difficult to approach the technological frontier? The works of Mokyr have made it clear that answering these questions contributes more than just an understanding of technology and its adoption. These questions are central to understanding the modern economy.

It may be most instructive to think about economic growth or stagnation like an onion. In the outer layer of the onion is long-run economic growth or stagnation. By economic growth, I mean "a sustained increase in economic prosperity as measured by the total goods and services produced in the economy" (Koyama and Rubin 2022: 4). The word "sustained" is important in this definition. Many civilizations have experienced temporary efflorescences—classical Greece and Rome, Song China, and the Abbasid Empire, to name a few—but until the last two centuries such economic advancements have not been sustained. This is what has made growth in the modern era different. It has been sustained to a degree that a large share of the world's population lives far from subsistence, and an increasing and non-trivial share lives in relative comfort.

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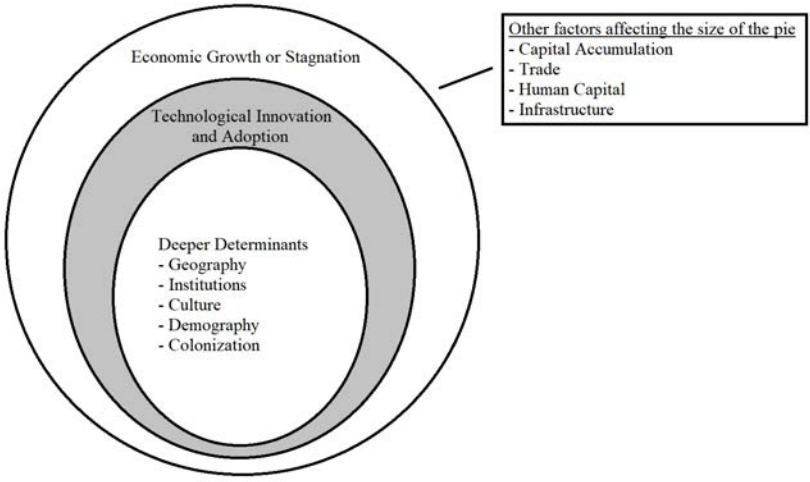
If the outer layer of the onion is economic growth, what is the next layer in—its most proximate cause? As laid out in Figure 1, Mokyr has been extremely convincing that technological innovation and adoption is the most proximate cause of growth. We can label this shaded layer the "Mokyr zone." Although this is now a standard way of thinking about growth, this was not always the case. Neo-classical models of growth, most famously the Solow-Swan model, placed other factors as central. Among the most important of these factors is capital accumulation: those countries with more capital tend to grow over time. Capital can grow faster where trade is (mostly) freely permitted and infrastructure permits the movement of goods and services. Later neo-classical economists such as Gary Becker added human capital to this list.

Figure 1: The Determinants of Economic Growth



However, as Mokyr has pointed out, none of these inputs into traditional neo-classical models explain the timing and location of the economic takeoff that birthed the modern economy. If one wants to explain the origins of modern growth, one must explain the structural, economic transformations that occurred in Britain in the late-18th and early 19th centuries. As Mokyr has made clear in several works, most prominently *The Lever of Riches: Technological Creativity and Economic Progress* (1990), *The Enlightened Economy: An Economic History of Britain, 1700–1850* (2009), and *A Culture of Growth: The Origins of the Modern Economy* (2016), the dominant paradigm of this period in British economic his-

tory was a rapid increase in the rate of innovation. Yes, capital was important. So was human capital—particularly that of the skilled craftsmen that Britain had in abundance (Kelly, Mokyr, and Ó Gráda 2023). However, these features alone cannot explain the timing or location of the initial takeoff. What must be explained is why Britain's rate of innovation increased so rapidly and why this did not occur in other parts of the world in previous periods. One must also explain why some parts of the world quickly adopted British technologies and became innovation leaders themselves. This was key to understanding the rise of the U.S., Germany, and Japan in the 19th century; Southern Europe, Korea, Taiwan, and Singapore (among many others) in the 20th century, and China and (potentially) India in the 21st century.

However, proximate causes are not the innermost layer of the "onion" of economic growth. Why are some countries more technologically progressive than others? Mokyr has spent much of his career thinking about precisely this question. In *A Culture of Growth*, Mokyr cites the spread of Enlightenment ideals which diffused throughout Europe in the period prior to industrialization as key. In *The Enlightened Economy*, Mokyr claims it was that these Enlightenment ideals spread to the broader population of artisans, tinkerers, and inventors—those with high human capital but not the educated elite—that mattered for the way that Britain's industrialization took off.[2] Kelly, Mokyr, and Ó Gráda show in a recent paper (2023) and a forthcoming book that one thing that differentiated Britain was that it had so many of these high human capital artisans to begin with. In *The Gifts of Athena* (2002), Mokyr carefully distinguishes between prescriptive knowledge (techniques that have worked in the past) and propositional knowledge (why things work). These distinctions are key to understanding why the takeoff happened when and where it did, as propositional knowledge began to overtake prescriptive knowledge in a host of industries in 18th-century Britain. Unlike prescriptive knowledge, propositional knowledge allows knowledge-creators to build off the insights of one another. This can help explain why the rate of innovation was *sustained* in 18th-century Britain, rather than petering out like in previous historical episodes of technological progress.

2 These insights have recently gained empirical support by Almelhem et al. (2024), who perform a textual analysis of all works published in England between 1500 and 1900 that have been digitized. They find that the Enlightenment notion of progress—i.e., that one can use science and rational thought to make the world a better place—was central to works at the nexus of science and political economy beginning in the middle of the 18th century.

Mokyr's insights have become the gold standard for understanding why Britain became technologically progressive when it did and why this type of progress did not first emerge elsewhere. But there is also a large literature which seeks the deeper causes of growth—in turn either explicitly or implicitly seeking the deeper causes of technological progress. In *How the World Became Rich* (2022), Mark Koyama and I lay out five sets of explanations for which literatures have emerged: geography, institutions, culture, demography, and colonization. Of these explanations, my own research has primarily focused on institutional and cultural causes, particularly those related to religion. In the remainder of this chapter, I will lay out why institutional and cultural phenomena are deeper determinants of economic growth and how we should think about these insights in the context of Britain's industrialization.

2. *Culture, Institutions, and Economic Growth*

Koyama and Rubin (2022) claim that there is no "silver bullet" for economic growth. A society can have growth-enhancing institutions, but this will not ensure economic growth. A society may have cultural norms favoring growth, but this by itself will not make growth happen. What matters is the *combination* of various features coming together at one time. On the other hand, while institutions or culture in isolation cannot fully explain why economic growth occurred in certain parts of the world, they *can* explain why some parts of the world failed to grow.

It should suffice to provide a few examples of the types of institutions that stop economic growth dead in its tracks. Among the most important growth-retarding type of political institutions are those that place few checks on executive power. Acemoglu and Robinson (2012) call these "extractive institutions." When there are few institutional impediments preventing those with power from using that power to satisfy their own desires, the distribution of resources is likely to be highly skewed towards those in power, and the incentive to invest in capital, human capital, or land is low. Relatedly, North, Wallis, and Weingast (2009) call this the "natural state," whereby elites share the rents made available by the productive activities of society, leaving everyone else behind. Since humans settled down during the Neolithic Revolution, most societies have been structured as natural states. It is only in the last few centuries that some societies—first in Europe and North America, and slowly spreading to other parts of the world in the 20th century—undertook institutional change that placed serious, binding

constraints on executive power. While getting rid of such institutions is not a panacea for economic growth, *sustained* growth is highly unlikely to occur when such institutions are present.

It bears repeating that this does not mean that simply getting rid of extractive institutions will lead to growth. But it does mean that societies with extractive institutions are much less likely to see sustained growth. In fact, this was likely the biggest obstacle for many of the historical societies that seemed primed for an economic takeoff prior to the 18th century. For instance, two of the leading historical candidates for such a takeoff were Song China and the Abbasid Caliphate. Both had relatively stable—yet autocratic—political institutions, engaged in trade, and by pre-modern standards had high rates of innovation. While there are several reasons both did not take off, a common and crucial reason is that both were autocratic. Rights were not secure in either regime. Government officials could play favorites, thereby discouraging individuals from challenging the status quo. Thus, while growth or innovation can happen in an autocratic setting, it is much less likely to do so. And it is *much* less likely that a big takeoff akin to the one that occurred in industrializing Britain would occur.

Another set of institutions that can inhibit growth are those that give significant political power to entities (elites) whose interests are not aligned with economic growth. This was a theme of my 2017 book, *Rulers, Religion, and Riches*, which sought to understand the role that religious legitimacy played in the economic fortunes of the Middle East and Western Europe. In short, it argues that to the extent that religion played a role in the divergent economic fortunes of the two regions, it did so via the role that religion plays in politics. Because religious legitimacy is relatively inexpensive and effective, it was often used by rulers in both regions to stay in power. In return for legitimating rule, political authorities gave religious elites a seat at the political bargaining table. For several reasons I explore in the book, Islam was more effective at legitimating rule than Christianity.[3] Over time, this meant that Western European rulers had greater incentive to seek alternative forms of legitimacy, which they eventually did in

3 Foremost among these reasons is the environment in which the religions were born. Christianity was born in the Roman Empire, which already had well-functioning political and legal institutions, and early Christian doctrine therefore had little to say on legitimating the state. Islam, on the other hand, was born at a time of tribal conflict, and a unifying ideology that brought different groups together under one political unit was therefore particularly valuable. As a result, there was much early Islamic doctrine connecting the legitimacy of rule to one's Islamic bona fides.

parliaments. The point here is not that religious authorities have preferences that are antithetical to economic growth. Instead, it is more that their preferences are orthogonal to growth, whereas for self-interested reasons the preferences of economic elites in parliaments typically favor growth. The latter desires policies favoring protection of property rights, infrastructure to support trade, naval protection for merchants, common weights and measures, and the like. Since the economic elite eventually obtained a more important seat at the political bargaining table in certain European countries (the first being the Dutch Republic and Britain), these types of policies followed.

Hence, while "getting religion (mostly) out of politics" does not ensure economic growth, it helps. This discussion highlights a more general point: those deeper determinants in the inner layer of the onion in Figure 1 *rarely work in isolation*. In this example from Rubin (2017), understanding why certain types of political institutions worked differently in different parts of the world requires an understanding of those society's cultures (in this case, their religions and the role that religion plays in politics). In general, Koyama and Rubin (2022) argue that although no single cause can be pointed to for being responsible for Britain or its followers' industrialization, the presence of several of the elements often viewed as good for growth—limited governance, cultural norms lauding trade and commerce, low birth and death rates, freedom from extractive colonial institutions—has been central to many economic takeoffs. The key in each case is that these growth-enhancing elements *interact* with each other.

Examples of the deeper roots of growth interacting with each other abound. For instance, geography can affect the type of institutions a society has or the degree to which those institutions facilitate growth. Recent work suggests that differences in the size of states between Europe and Asia—the former having several small states and the later having fewer, but larger, empires—is due to the degree to which land is fractured. Fernández-Villaverde et al. (2023) argues that the several natural barriers in Europe, such as the Alps and Pyrenees, meant that there was no large expanse of contiguous, highly productive land. The opposite was the case in East Asia, where the large North China plain was productive enough to house a large, unified civilization. This is an important example of how geography can affect the type of institutional development that has been viewed as important for economic growth. Scheidel (2019) argues that the failure of empire to emerge in Europe after the fall of Rome laid the foundation for long-run growth, as smaller and weaker entities filled the void, and thus power was

much more dispersed than it was elsewhere in Eurasia.

Institutional arrangements can also affect how societies respond to geographical endowments. For instance, Acemoglu, Johnson, and Robinson (2005) show that the European discovery of the Americas had a differential impact on the Atlantic-facing economies depending on the type of political institutions each country had. In nations where the crown already had control over long-distance commerce, the opening of the Atlantic further strengthened royal power, as a large share of the windfalls from the Atlantic trade went into the pocket of the crown. This further reduced the incentive for monarchs to negotiate with other entities, and countries like Spain dispensed with consulting representative institutions. On the other hand, where monarchical power over trade and commerce was weaker, such as in England and the Dutch Republic, the opening of the Atlantic benefited overseas merchants. They eventually translated this economic power into political power via representation in parliaments. These monarchs faced greater constraints on their power—one of the institutional features often viewed as a necessary (though not sufficient) condition for growth to occur.

These examples are just the tip of the iceberg. There are innumerable examples of colonization interacting with institutions (Acemoglu, Johnson, and Robinson 2001; Banerjee and Iyer 2005; Dell 2010; Dell and Olken 2020) and culture (Nunn and Wantchekon 2011; Michalopoulos and Papaioannou 2016), institutions interacting with culture (Greif 1994, 2006; Becker et al. 2016; Schulz 2022; Bisin et al. 2024), geography interacting with institutions (Sokoloff and Engerman 2000; Acemoglu, Johnson, and Robinson 2002) and culture (Nunn and Puga 2012), demography interacting with institutions (Voigtländer and Voth 2006; de Moor and van Zanden 2010; Galor 2011), and so on. There are now relatively large literatures at all these intersections. Yet, these intersections remain at the inner core of the onion. How do we get from the interactions between the five elements cited in Koyama and Rubin (2022)—geography, institutions, culture, demography, and colonization—to a high rate of innovation? Was there something about Britain that made it particularly disposed to having an accelerated rate of innovation in the late 18th century? The remainder of this chapter considers this possibility.

3. *Britain, Structural Pre-conditions, and the Economic Takeoff*

A key point made thus far is that there is no silver bullet for a society to achieve sustained economic growth. In fact, what worked in one cultural, demographic, and institutional setting may not work in another. But this does not mean that seeking what did work in the past is a fruitless pursuit. By seeking what did work—first in Britain and then in select parts of the world—we can gain a better understanding of how these conditions have interacted in the past and, perhaps more importantly, were *not* an impediment to growth under the specific conditions of the case in question.

For the remainder of this chapter, I will focus on the pre-conditions that Britain had on the eve of its industrialization. There are several reasons to do so. Most obviously, it was in Britain where the modern economy was born. It was also the first place to have a rate of innovation that was great enough to eventually break society out of the Malthusian trap and (eventually, in the 19th century) see wages rise across all of society. In other words, it was the first society to have a mix of conditions in the inner layer of the onion that permitted a movement into the penultimate layer ("Technological Innovation and Adoption"), and eventually the outer layer ("Economic Growth"), as represented in Figure 1.

Koyama and Rubin (2022) cite several pre-conditions that characterized Britain on the eve of its industrialization. The first is that it had relatively limited governance. Greif and Rubin (2024) argue that the rise of the English Parliament occurred because of a series of events that left the Tudor monarchs with relatively low legitimacy—the fallout of the Wars of the Roses, the English Reformation, and the first two sole female monarchs (Mary I and Elizabeth I) key among them. This meant that they had to seek legitimacy from other powerful elites, and the most obvious place to do so was Parliament. The Tudors (1485-1603) therefore sought to promote Parliament, and the ruling idea of the "Crown in Parliament" emerged in this period. This in turn led to conflict with the more legitimate Stuarts, who succeeded the Tudors. The two sides engaged in non-violent conflict in the halls of Westminster as well as violent conflict on the battlefields (the English Civil Wars of 1642-1651 and the Glorious Revolution of 1688), with Parliament ultimately winning the upper hand. The result was the onset of a period of Parliamentary supremacy that still characterizes the UK in the present day. The key point of these events for the present purposes is that by the mid-18th century, the British crown was *limited* in what it could do. Parliament could constrain the

worst actions of the crown, and it eventually superseded the crown in political importance. Parliament itself was constrained by those with the right to vote, as it was an elected body.

Limited governance is not a sufficient condition for economic growth to occur. The Dutch Republic had limited governance before Britain. In the wake of the Dutch Revolt against Spanish rule (1568-1648), the Dutch parliament gained significant legislative *and* executive power. It was certainly a limited body, and it represented all the Dutch provinces. Yet, while the Dutch Republic was probably the wealthiest nation in the world for 150 years or so after the onset of the revolt, it did not have a takeoff like the one that occurred in Britain. However, as noted earlier in this chapter, it is possible that a lack of limited governance can *prevent* an economic takeoff. One need to look no further than Song China—one of the wealthiest pre-industrial states—to see the limits that autocratic governance can place on sustained economic growth.

Another precondition that Britain had was a large domestic market connected by transport networks of canals and turnpikes (Bogart 2014). This allowed for greater market activity, which in turn created new consumption opportunities. de Vries (2008) argued that this enabled an "industrious revolution." As households became more involved in the market economy, their desire to consume incentivized them to work harder to earn the wages to support their consumption. Of course, Britain was not the only place in the world with large internal markets—China had a much larger market, and the north and south were connected by the Grand Canal. However, a place like the Dutch Republic—a much smaller country whose economy was largely based on trade—did not have nearly the internal markets that Britain did, although it shared many other preconditions.

There were several other preconditions that Koyama and Rubin (2022, ch. 8) cite as being (potentially) key to Britain's rise: the rise of capitalist agriculture in the centuries preceding industrialization, a growing Atlantic empire fueled by mercantilist theory, its participation in the transatlantic slave trade, its relatively high state capacity, and several more. Although there is not enough space in the present chapter to dive into each of these conditions in depth, one factor stands out as important: Britain's relative abundance of skilled mechanical workers. These included watchmakers, printers, carpenters, and wrights, among others (Mokyr, Sarid, and van der Beek 2022; Kelly, Mokyr, and Ó Gráda 2023). To be clear, Britain was not the only region with an abundance of skilled workers. Many of the free cities of the Holy Roman Empire had skilled craftsmen in abundance,

as did Paris and several other large European cities. However, according to the many convincing works of Mokyr (2009, 2016; Kelly, Mokyr, and Ó Gráda 2023), what set Britain apart was its *abundance* of skilled workers. These skilled craftsmen were precisely the type of individuals who would go on to create the inventions associated with Britain's Industrial Revolution. They would also repair and improve upon these inventions. Diffused with the Enlightenment ideals that progress was both possible and desirable, a new "culture of growth" (Mokyr 2016) emerged in the one place with all the preconditions to make it happen: Britain.

It is important to point out a few caveats to the above claims. The first is that what happened in Britain is not directly replicable. British culture affected how many of the preconditions listed above translated into economic returns. A society without a consumer culture or imbued with Enlightenment ideals is unlikely to industrialize in the manner that Britain did. Moreover, its political transition was fraught with many difficulties—including two removals of a sitting king in the span of half a century—and subject to luck (i.e., Henry VIII not having a stable of adult male heirs). The second is that it is still difficult for the economic historian to parse out which of Britain's preconditions were necessary for its take-off, even with the benefit of hindsight. Convincing cases have been made for the necessity of all the preconditions listed above. But this surely leaves the Industrial Revolution overexplained (and even this does not account for alternative hypotheses of Britain's industrialization, such as the thesis posed by Allen 2009).

However, those countries that followed Britain's path to industrialization did not need to reinvent the wheel. Under certain conditions, these follower countries were able to take what worked in Britain and adapt it to their own needs. This happened in parts of North America, Western Europe, and Japan in the 19th century, Eastern and Southern Europe and parts of East Asia in the 20th century, and it will hopefully happen in many other parts of the world in the 21st century. None of these countries had the exact preconditions that Britain had in the 18th century, but the point is that they did not need to. It certainly helped to have some of those preconditions, such as relatively limited governance, skilled workers, high state capacity, large internal markets, and a culture conducive to growth. But once the initial trail was blazed, the follower nations could adapt what Britain had done to their own cultural context. By the late 19th century, high rates of innovation were no longer monopolized by the British. The Second Industrial Revolution was much more global, with key advances coming from the US, France, Germany, Belgium, and (of course) Britain.

To return to the question posed by the title of this chapter: how did the world become rich? It is hopefully clear that there is no one answer, and that local context matters in any specific part of the world. But we can gain some type of insight into what *might* matter. On the innermost layer of the onion in Figure 1, there are a variety of conditions that, when combined, make a jump to the next layer more likely. Once the "lever of riches"—a high rate of innovation—is unleashed, whether through indigenous innovation or adoption from others, increases in the standard of living typically follow, so long as they are not hampered by some of those "inner onion" conditions (e.g., bad institutions). Although this answer might not be satisfying—there is not a single spigot that can be turned on to make riches flow—unlocking the keys to modern wealth is a complicated process. If it were not, societies would have figured it out long before the 18th century.

References

Acemoglu, Daron, Simon Johnson, and James A. Robinson. 2001. "The Colonial Origins of Comparative Development: An Empirical Investigation." *American Economic Review* 91(5): 1369–1401.

Acemoglu, Daron, Simon Johnson, and James A. Robinson. 2002. "Reversal of Fortune: Geography and Institutions in the Making of the Modern World Income Distribution." *Quarterly Journal of Economics* 117(4): 1231–1294.

Acemoglu, Daron, Simon Johnson, and James Robinson. 2005. "The Rise of Europe: Atlantic Trade, Institutional Change, and Economic Growth." *American Economic Review* 95(3): 546–579.

Acemoglu, Daron, and James A. Robinson. 2012. *Why Nations Fail: The Origins of Power, Prosperity, and Poverty*. New York: Crown.

Allen, Robert C. 2009. *The British Industrial Revolution in Global Perspective*. Cambridge: Cambridge University Press.

Almelhem, Ali, Murat Iyigun, Austin Kennedy, and Jared Rubin. 2024. "Enlightenment Ideals and Belief in Progress in the Run-up to the Industrial Revolution: A Textual Analysis." Working Paper.

Banerjee, Abhijit, and Lakshmi Iyer. 2005. "History, Institutions, and Economic Performance: The Legacy of Colonial Land Tenure Systems in India." *American Economic Review* 95(4): 1190–1213.

Becker, Sascha O., Katrin Boeckh, Christa Hainz, and Ludger Woessmann. 2016. "The Empire Is Dead, Long Live the Empire! Long-run Persistence of Trust and Corruption in the Bureaucracy." *Economic Journal* 126(590): 40–74.

Bisin, Alberto, Jared Rubin, Avner Seror, and Thierry Verdier. 2024. "Culture, Institutions, and the Long Divergence." *Journal of Economic Growth* 29(1): 1–40.

Bogart, Dan. 2014. "The Transport Revolution in Industrialising Britain." In *The Cambridge Economic History of Modern Britain* (new edn.), Vol. 1, 1700–1870, ed. Roderick Floud, Jane Humphries, and Paul Johnson. Cambridge: Cambridge University Press, pp. 368–391.

de Moor, Tine, and Jan Luiten van Zanden. 2010. "Girl Power: The European Marriage Pattern and Labour Markets in the North Sea Region in the Late Medieval and Early Modern Period." *Economic History Review* 63(1): 1–33.

de Vries, Jan. 2008. *The Industrious Revolution*. Cambridge: Cambridge University Press.

Dell, Melissa. 2010. "The Persistent Effects of Peru's Mining Mita." *Econometrica* 78(6): 1863–1903.

Dell, Melissa, and Benjamin A. Olken. 2020. "The Development Effects of the Extractive Colonial Economy: The Dutch Cultivation System in Java." *Review of Economic Studies* 87(1): 164–203.

Fernández-Villaverde, Jesús, Mark Koyama, Youhong Lin, and Tuan-Hwee Sng. 2023. "The Fractured-land Hypothesis." *Quarterly Journal of Economics* 138(2): 1173–1231.

Galor, Oded. 2011. *Unified Growth Theory*. Princeton, NJ: Princeton University Press.

Greif, Avner. 1994. "Cultural Beliefs and the Organization of Society: A Historical and Theoretical Reflection on Collectivist and Individualist Societies." *Journal of Political Economy* 102(5): 912–950.

Greif, Avner. 2006. *Institutions and the Path to the Modern Economy: Lessons from Medieval Trade*. New York: Cambridge University Press.

Greif, Avner, and Jared Rubin. 2024 "Endogenous Political Legitimacy: The Tudor Roots of England's Constitutional Governance." *Journal of Economic History* 84(3): 655–689.

Kelly, Morgan, Joel Mokyr, and Cormac Ó Gráda. 2023. "The Mechanics of the Industrial Revolution." *Journal of Political Economy* 131(1): 59–94.

Koyama, Mark, and Jared Rubin. 2022. *How the World Became Rich: The Historical Origins of Economic Growth*. Cambridge: Polity Press.

Michalopoulos, Stelios, and Elias Papaioannou. 2016. "The Long-run Effects of the Scramble for Africa." *American Economic Review* 106(7): 1802–1848.

Mokyr, Joel. 1990. *The Lever of Riches: Technological Creativity and Economic Progress*. Oxford: Oxford University Press.

Mokyr, Joel. 2002. *The Gifts of Athena: Historical Origins of the Knowledge Economy*. Princeton, NJ: Princeton University Press.

Mokyr, Joel. 2009. *The Enlightened Economy: An Economic History of Britain, 1700–1850*. New Haven: Yale University Press.

Mokyr, Joel. 2016. *A Culture of Growth: The Origins of the Modern Economy*. Princeton, NJ: Princeton University Press.

Mokyr, Joel, Assaf Sarid, and Karine van der Beek. 2022. "The Wheels of Change: Technology Adoption, Millwrights and the Persistence in Britain's Industrialisation." *Economic Journal* 132(645): 1894–1926.

North, Douglass C., John Joseph Wallis, and Barry R. Weingast. 2009. *Violence and Social Orders: A Conceptual Framework for Interpreting Recorded Human History*. Cambridge: Cambridge University Press.

Nunn, Nathan, and Diego Puga. 2012. "Ruggedness: The Blessing of Bad Geography in Africa." *Review of Economics and Statistics* 94(1): 20–36.

Nunn, Nathan, and Leonard Wantchekon. 2011. "The Slave Trade and the Origins of Mistrust in Africa." *American Economic Review* 101(7): 3221–3252.

Rubin, Jared. 2017. *Rulers, Religion, and Riches: Why the West Got Rich and the Middle East Did Not*. New York: Cambridge University Press.

Scheidel, Walter. 2019. *Escape from Rome: The Failure of Empire and the Road to Prosperity*. Princeton, NJ: Princeton University Press.

Schulz, Jonathan. 2022. "Kin-networks and Institutional Development." *Economic Journal* 132(647): 2578–2613.

Sokoloff, Kenneth L., and Stanley L. Engerman. 2000. "Institutions, Factor Endowments, and Paths of Development in the New World." *Journal of Economic Perspectives* 14(3): 217–232.

Voigtländer, Nico, and Hans-Joachim Voth. 2006. "Why England? Demographic Factors, Structural Change and Physical Capital Accumulation during the Industrial Revolution." *Journal of Economic Growth* 11(4): 319–361.

Upper Tail Human Capital Formation and its Economic Effects[1]

Ralf R. Meisenzahl[2]

1. Introduction

Technology, which Joel Mokyr (2002) so aptly describes as the "lever of riches," is the key driver of economic growth. Understanding the processes behind technological progress is hence of first order importance when studying economic growth. On a high-level, economists have identified human capital as the main driver of technological process. However, what is less clear is whether all types of human capital are equally important and what institutions produce the human capital most relevant for technological progress.

One way to assess the relative importance of different types of human capital is studying the transition to modern growth---that is, the First (1760-1840) and the Second Industrial Revolution (1890-1914). Starting with the question whether the First Industrial Revolution started in Britain because of its stock of human capital, Mitch (1998, 2004) observes that Britain's literacy rates were not particularly high compared to other European countries and hence are unlikely to explain the British leadership in the First Industrial Revolution.

Mokyr (2005, 2009) posits that what mattered for and in the transition to modern growth is the upper tail, the top 3-5 percent, of the skill distribution rather than the average.[3] Kelly, Mokyr, and Ó Gráda (2023) show that the

1 This essay builds in part on prior research with Jeremiah Dittmar entitled "The Research University, Invention, and Industry: Evidence from German History." The views expressed here are those of the author and do not necessarily represent the views of the Federal Reserve Bank of Chicago, the Board of Governors or the Federal Reserve System.

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3 Mokyr (2016) extends this argument to the intellectual and cultural origins that underpinned the emergence of a significant intellectual, progress-oriented elite.

industrialization began in regions with comparatively high skills and low wages. An important part of the argument is that this upper tail human capital is needed to implement and adapt macroinvention and generate myriad microinventions that improve productivity. Consider two specific cases. Most of Leonardo da Vinci's inventions remained drawings because there were no workmen who had the knowledge, ability, resources, or materials to turn these inventions into reality. In contrast, British engineers not only built but also tinkered and improved steam engines to increase their productivity (Nuvolari, Verspagen, and von Tunzelmann 2011). More broadly, Meisenzahl and Mokyr (2012) document that skilled British workmen shaped the rate and direction of invention during the First British Industrial Revolution.[4]

It is natural to ask why Britain had this advantage in upper tail human capital during the First Industrial Revolution, and how the continental economies responded in order to reduce the gap in upper tail human capital to facilitate the subsequent catch-up during the Second Industrial Revolution. Potential explanations for the initial advantages of Britain have focused on historical skilled distributions, skill creation, and incentives for acquiring skills. For instance, Ben Zeev, Mokyr and van der Beek (2017) argue that the largely unregulated apprenticeship system responded dynamically to the increased demand for skilled labor.[5] This raises the question why Britain had a comparative advantage in skilled workmen at the onset of the industrialization. Mokyr, Sarid, and van der Beek (2022) argue that the historical adoption of watermills predicts the location of skilled workmen.[6]

Taken together, the literature shows that the answer to the first question, why Britain had an advantage in upper tail human capital at the onset of industrialization, is a mix of happenstance and unique institutional settings. Such a mix is hard to replicate. Indeed, in other countries, regional differences and the presence of upper tail human capital also appears to be rooted in country-specific histories.

4 Hanlon (2022) documents the emergence of the term "engineers" as a profession. In patent data, an increasing number of inventors list their profession as "engineer" during this time.

5 De la Croix, Doepke, and Mokyr (2018) provide a model of European apprenticeship institutions, such as guilds and journeymanship that allowed not only for person-to-person transmission of knowledge but also the spread of knowledge.

6 In contrast to these supply side explanations, Berg and Hudson (2021) argue that British dominance of the Atlantic trade accounts for the transformation arguing that during the industrialization the hinterland of Atlantic ports flourished. Similarly, Zahedieh (2021), argues that the British Atlantic slave system that transformed the market for knowledge and skills.

For instance, in the context of France, a recent study suggests that the presence of upper tail human capital in France measured as subscriptions to an encyclopedia containing advances in technology and machinery can be traced backed to the Reformation (Rosenberger 2023). Squicciarini and Voigtländer (2015) show that this measure of upper tail human capital is correlated with industrialization in France.[7] But neither the British nor the French case let us draw generalizable conclusions about or derive policies for the successful production of upper tail human capital.

Turning to the second question, what institutions produce the human capital most relevant for technological progress, the remainder of this essay focuses on the education policies in historical Germany, which provide an opportunity to assess policies aimed at producing upper tail human capital. Specifically, since the education reforms and new education institutions were originally designed to produce upper tail human capital relevant for the state rather than for economic purposes, the German context also allows us to quantitatively assess to what extent upper tail human capital fostered economic growth and catch-up in the Second Industrial Revolution.

The Enlightenment, which Mokyr (2009, 2016) identifies as crucial for the British Industrial Revolution, is also the intellectual origin of many reforms in Prussia. King Frederick II the Great (1712-1786) of Prussia supported "enlightened absolutism" believing that the ruler should be the first servant of the state. The early reforms reflecting the Enlightenment included modernization of the bureaucracy and of the judicial system, as well as allowing some freedom of press and speech. The Prussian reform program (Stein-Hardenberg reforms) implemented later by bureaucrats was heavily influenced by the Enlightenment and included modernized education policies.

7 It should be noted that some authors introduced other measures of upper tail human capital. While Meisenzahl and Mokyr (2012) rely on membership in the Society of Civil Engineers and similar societies or on a mention in sector-specific histories, Dittmar and Meisenzahl (2020) posit that non-nobility entries in the German National Biography is a useful measure of upper tail human capital. de la Croix et al (2023) measure upper tail human capital using lists of university professors though this definition appears to capture the upper tail of the upper tail of the skill distribution instead of a broader definition put for by Mokyr (2005). Another alternative measure could be patentees. However, measures based on patents have two major shortcomings. First, not all inventions are going to be patented, either by choice (Meisenzahl and Mokyr, 2012) or because a patent system was not established at the time as for instance in many parts of historical Germany before 1840 (Donges and Selgert 2019). Second, the patentee is not necessarily the inventor. Mowery (2012) points out that the distinction between skilled workmen, who implement and improve, and inventors is somewhat vague and hence a precise measurement of upper tail human capital may be difficult.

Different from most Western states, Prussia introduced a civil servant exam for high-ranking government position in 1770 that also applied to the service nobility. To ensure a sufficient supply of educated civil servants, the first involvements of the Prussian state in higher education focused on the education of civil servants and engineers in the Berliner Bergakademie (founded 1770) for mining and the Bauakademie (founded 1790) for construction and civil engineering. Engineering and applied sciences were also taught in military schools such as Koenigliche Allgemeine Kriegsschule, which was founded 1765 as Académie des Nobles with the goal to groom young nobles for careers in the military and public service (Friedlaender 1854). In other words, the reforms institutionalized several key components of the Enlightenment. As a consequence, not only had the Prussian state education institutions ensured a sufficient supply of qualified administrators, but it also created an intelligentsia that embraced the Enlightenment and welcomed the French Revolution. While the Prussian reformers were quite heterogenous in terms of their social background, they all were well-educated, high-ranking Prussia officials with a pro-growth mindset (Schulze 1999).

The perhaps best example for a pro-growth, service nobility member of the Prussian reformers is Karl August Fürst von Hardenberg (1750-1822) who exhibited a clear progressive vision well before the Prussian reform program colloquially named after him. Having studied in Leipzig and Gottingen, Hardenberg entered the civil service and was eventually appointed minister responsible for the principalities of Ansbach and Bayreuth that had fallen under Prussian control in 1791. The University of Erlangen, part of the principality of Bayreuth at the time, was part of his portfolio. Under Hardenberg's leadership the university started to offer classes in mechanics and machine building as well as military science and cameralism (German science of public administration). Hardenberg's explicit goal was to change the university in ways that would be useful to the state (Willett 2001).

More generally, the reformers understood the need for upper tail human capital and here specifically in engineering and applied sciences for the purposes of the state. One key obstacle was the lack of civil engineers. Around the time of the French Revolution, engineering was mostly absent from higher education in the German lands, and universities were slow to change. Indeed, most progressive reforms at German universities were top-down implemented by progressive bureaucratic circumventing university faculties that resisted change (Dittmar and Meisenzahl 2022). König (2006) notes that the supply for university-trained

engineers remained much lower than demand through about the 19th century. Hence, alternatives to university education were needed.

Part of the Prussian reform program was the overhaul of the education system, including the educational institutions aimed at providing education for high-ranking civil service jobs. A key assumption in the reform process was that class was not a determinant of the ability to learn and understand. In other words, the reformers intended to break the link between class and a specific job (Jeismann 1969). Hence, the broad reforms of elementary and secondary education helped to increase the supply of candidates for civil service. Beginning in 1821, the state increased its involvement beyond civil servant education.

2. The Production of Upper Tail Human Capital in the German lands

The flagship institution for civil servant education in Prussia was the Berliner Gewerbeinstitut (opened in 1821 as Königliches Technisches Institut (Royal Technical Institute) and renamed in 1827), which was modeled after the Bergakademie and the Bauakademie. As the name suggests, the institution emphasized technical training. To ensure that the best candidates for civil service were selected from all parts of the Prussian states, the reformers also founded regional schools (Provizial-Gewerbeschulen), mostly in the provincial capitals. Their best students received stipends and were offered the possibility to study at the Berliner Gewerbeinstitut. The Prussia ministry of trade pushed this new system of guided career paths for civil servants (Harney 1987).

A prerequisite for attending these schools was that students either have received an elementary education, gone through apprenticeship, and taken classes at a continuation school or have finished at least eight years of schooling. However, the education was free in the sense that students obtained stipends to attend a Gewerbeschule. By providing stipends to qualified candidates, the reformers wanted to ensure that the most capable students regardless of their social background could attend and eventually enter higher civil service, thereby ensuring high-quality civil service in the long run. This approach succeeded by most standards. Contrary to universities that have often been described as elitist during this time, Gewerbeschulen were not seen as elitist institutions. Indeed, many of their students came from lower- and middle-class backgrounds (Harney

1987).[8] Upon completion, students were required to work for one year before entering the three-year program at the Berliner Gewerbeinstituts.

Table 1: Curricula of Provinzial-Gewerbeschulen

Topic	Münster (1829)	Elberfeld (1826)	Hagen (1824)	Trier (1831)	Cologne (1839)	Aachen (1824)	Bielefeld (1831)
Drafting and design	12	20	12	20	14	X*	X
Math	6	8	6	8	8	X	X
Physics	4	2	2	2	12	-	X
Chemistry	-	4	2	-	-	X	X
Natural history	-	2	-	-	-	-	-
Architecture	-	-	-	-	-	X	-
Mechanics	-	-	-	-	6	-	-
German	-	-	2	-	-	-	-
Penmanship	-	2	-	-	-	-	X
Total	22	38	24	30	40	?	?

Source: Schiersmann (1979, 95). * Actual number of hours unknown.

Table 1 shows the curricula for selected Provinzial-Gewerbeschulen. First, all Gewerbeschulen taught math, physics,as well as drafting and design, highlighting the focus on applied science and engineering in these schools. Some school also taught chemistry or mechanics. The variation in subjects reflected in part local needs.

The Prussian state made significant financial commitments to this new system of schools. As the flagship institutions, the Gewerbeinstitut in Berlin received about 8,300 thaler annually. The smaller sister institutions, the twenty Provinzial-Gewerbeschulen, received between 500 and 1,200 thaler annually from the Prussian ministry for interior affairs (Jacobi 1842). The spending also reflected the progressive, enlightened mindset of the reformers. For instance, part of the annual spending was used to purchase teaching materials in English and French as well as laboratory equipment for physics and chemistry lectures. In addition, the Provinzial-Gewerbeschulen received local support from the respective

8 This policy mirrors the efforts of Luther and his followers during the Protest Reformation to cast a wide net to find talented individuals that could be educated to later take position in the clergy or in local administration (Dittmar and Meisenzahl 2020).

municipalities in the form of rent-free use of public buildings. In some cases, the municipality paid for the construction of new buildings.

Outside Prussia similar institutions emerged. For instance, the establishment of Gewerbeschulen in Saxony mirrored the Prussia blueprint. Here, the flagship institution was the Technical School in Dresden. Jacobi (1842) documents the school's extensive collection of over 1,500 books on math, physics, chemistry, geography, statistics, construction, machines, and technology as well as a collection of about 2,500 design samples and blueprints. Notably, the school also owned various looms and steam engines that could be studied and hence, it may not be surprising that Saxony was the first region to mechanize the textiles sector (Forberger 1958, 1982). The schools in Chemnitz, Zittau, and Plauen were modeled after the Dresden school.

3. The Economic Effect of Gewerbeschulen

The Gewerbeinstitut and its regional cousins were very successful in producing engineers and skilled workers. Meisenzahl (2015) notes that many graduates of Gewerbeschulen went to work in local industries. Indeed, a significant number of well-known engineers in the electrical and automobile industries received their education at a Gewerbeschule. In the British context, Meisenzahl and Mokyr (2012) employ in their measurement of upper tail human capital in Britain the biographies of Society of Civil Engineers members. In the German context, the fact that most founding members of the Verein der deutschen Ingenieure (Society of German Engineers, founded 1856) graduated from the Gewerbeinstitut (König 2006) and hence went through education by the Gewerbeschulen suggests that these institutions produced the upper tail human capital most valuable in the first and second Industrial Revolution---skilled workmen who could implement and adapt new technologies. Hence, we expect that places close to Gewerbeschulen had an advantage in local upper tail human capital and should industrialize faster, similar to the argument made in Kelly, Mokyr, and Ó Gráda (2023) for Britain.

To assess the economic impact of these new types of educational institutions, we complement data on Gewerbeschulen[9] with city-level manufacturing data for

9 We use Gewerbeschule for ease of reading since there were not clear naming conventions (such as "university") that would clearly indicate the purpose of the institution. As such, our coding includes Fachschulen and Fachoberschulen that served similar purposes—that is, they focused on applied sciences and applications. For a detailed descriptions of Fachschulen, see Lundgreen (1987).

2,254 towns in German-speaking Europe constructed by Dittmar and Meisenzahl (2022).[10] Their dataset is based on entries from the Deutsches Städtebuch (Keyser 1939-1974), which contains detailed histories of settlements in German-speaking Europe. The key criterion for inclusion is that the settlement acquired city rights. Among many other details, the city histories record the timing and sector of manufacturing establishments opening or being present. While the data may be subject to measurement error, especially on the precise timing of a manufacturing establishment opening, Dittmar and Meisenzahl (2022) show that their manufacturing data is highly correlated with the 1848 Prussian Manufacturing Census.

In the presence of search cost and agglomeration effects, we expect that cities close to a Gewerbeschule have an advantage by being able to benefit more from these institutions. For instance, firms closer to Gewerbeschulen may find it easier to attract skilled workmen graduating from these schools, hiring teachers as consultants, and learning about the latest advances in science and mechanics in formal and informal local settings (e.g., social gatherings).[11] It then follows that if Gewerbeschulen produced skilled workmen (upper tail human capital) then we would expect that differentially more manufacturing firms would open in places close to the Gewerbeschulen.

We test this hypothesis in the cross-section of German-speaking towns. Specifically, we test whether a town within 25 kilometers of a Gewerbeschule experienced a stronger growth in manufacturing between 1820 and 1900 since the first Gewerbeschule in our sample opened in 1818. In the sample a little more than a quarter of towns (642) are within 25 kilometers of one of the 57 Gewerbeschulen. We estimate the following regression:

$$(1) \quad manufacturing_i = \beta\, Gewerbeschule_i + \gamma\, Controls_i + \varepsilon_i$$

where manufacturing is the total number of manufacturing establishments opening in town i and $Gewerbeschule_i$ is an indicator for a Gewerbeschule being present in a 25-kilometer radius around town i. Controls include the number of pre-1820 manufacturing establishments openings, the town population in 1700, 1750, and 1800 as well as state (as of 1817) fixed effects.

10 The final dataset focuses on the 2,254 cities that are examined in Cantoni and Yuchtman (2014) who pioneered the use of this specific data source in economics research.

11 During the sample period, societies with the stated goal of fostering economic progress were established throughout Germany (Cinnirella, Hornung, and Koschnick 2022).

Table 2 shows the results of estimating equation (1). Column 1 shows the estimate of being close to a Gewerbeschule and manufacturing establishments without any control variables. The estimate suggests that towns that were close to a Gewerbeschule had on average almost one additional manufacturing establishment opening than a town far from a Gewerbeschule. Compared to a sample average of 2.08 establishments opening, the point estimate suggests a large economic effect of Gewerbeschulen.

Table 2: Gewerbeschulen and Manufacturing

	Manufacturing Establishments 1820-1900				
Indicator: Gewerbeschulen	0.920***	0.751***	0.622***	0.595***	0.614***
	(0.119)	(0.121)	(0.186)	(0.187)	(0.175)
Pre-1820 Manufacturing	No	Yes	Yes	Yes	Yes
State Fixed Effects	No	No	Yes	Yes	Yes
Population in 1800	No	No	No	Yes	Yes
Population in 1750	No	No	No	No	Yes
Population in 1700	No	No	No	No	Yes
Observations	2254	2254	2254	2254	2254
With School within 25 km	642	642	642	642	642
With Technical School	57	57	57	57	57
Mean of Outcome	2.082	2.082	2.082	2.082	2.082

One concern is that Gewerbeschulen were placed in areas that had already industrialized before and hence the indicator variable for Gerwerbeschule would potentially pick up agglomeration effects or better unobservable economic conditions for manufacturing in the town. To alleviate this concern, we control for the number of manufacturing establishment openings before 1820 as a measure of manufacturing prospects in column (2). While the point estimate is somewhat smaller than in column (1), the estimate effect remains highly statistically and economically significant.

Another concern is institutional changes on the state level. For instance,

Acemoglu et al. (2011) show that towns in German territories that experienced radical institutional changes, including the introduction of free enterprise laws, experienced faster growth. However, controlling for these changes by including state fixed effects does not change our main results (column 3). Similarly, including another common measure for economic advantages of a town, its population size, does not affect the results (column 4 and 5).

The cross-sectional analysis suggests that Gewerbeschulen fostered growth in local manufacturing. To better understand the effect of Gewerbeschules and to tighten identification, we next analyze how the effect evolved over time. For this purpose, we divide the sample in 20-year time periods. With many Gewerbeschulen being opened between 1820 and 1840, we would expect the effect of being close to a school to be limited to early in the sample (1820-1840) for two reasons. First, the schools were either not present or new. Second, the schools were originally often intended to produce civil servants rather than human capital used in industry. That said, this human capital was in demand from industry, especially during the Second Industrial Revolution. Hence, we would expect strong effects during the beginning of the Second Industrial Revolution from 1850 on as engineers were in high demand in many industries, such as fabricated metals, auto manufacturing, and electronics that emerged during the Second Industrial Revolution.

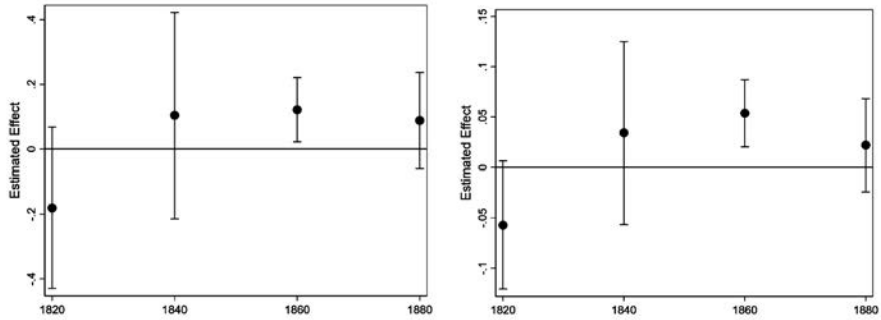
We study the timing of the effect of a Gewerbeschule on manufacturing using a flexible specification that allows us to capture the time-varying effect in 20-year intervals. Specifically, we estimate the following regression:

$$(2) \quad manufacturing_{it} = \sum_{s=1820}^{1880} \beta_s \left(Gewerbeschule_i * time_s \right) + \sum_{s=1760}^{1880} \tau_s \left(university_i * time_s \right) + \gamma_i + \delta_t + \varepsilon_{it}$$

where the city-time-period level outcome variable is the number of manufacturing establishment openings. We interact our main explanatory variable $Gewerbeschule_i$, which is the number of Gewerbeschulen that a city is close to (within 25 km of). Since Dittmar and Meisenzahl (2022) show that cities close to universities experience in increase in manufacturing, we control for whether the cities are close to a university (within 25km). We also include territory-time fixed effects (δ_t) to account for the overall growth within a territory in a time

period. These fixed effects absorb legal and other changes that could be confounding factors. Last, we include town fixed effects (γ_i) to control for unobserved, time-invariant location advantages.

Figure 1: Time-varying Effect of Gewerbeschulen on Manufacturing



a) Total Manufacturing b) Any Manufacturing

Figure 1 shows the results from estimating equation (2). The left panel plots the point estimates and their 90 percent standard error bands for the period 1820-1839 (indicated as 1820), 1840-1859 (indicated as 1840), 1860-1879 (indicated as 1860), and 1880-1899 (indicated as 1880). As expected, we do not find that towns close to Gewerbeschulen experienced stronger manufacturing growth between 1820-1839. On the contrary, if anything, towns close to Gewerbeschulen experienced fewer openings of manufacturing events during the early time period. However, we find strong positive effects of Gewerbeschulen on manufacturing establishment openings for the 1840-1899 time period, during the starting and maturing of the Second Industrial Revolution though some point estimates are measured imprecisely. Cumulatively, being close to an additional Gewerbeschule increased the number of manufacturing establishment openings by 0.30 during this time period. Compared with an average of 1.1 establishment openings between 1840 and 1899, the estimated effect is sizable.

The right panel of figure 1 shows the result of estimating equation (2) with an indicator variable that is equal to 1 if a town experienced any manufacturing establishment openings during the respective time period. In other words, the panel shows the time-varying effect of the extensive margin. As for the number of manufacturing events, towns close to Gewerbeschulen were less likely to

experience a manufacturing establishment opening between 1820 and 1839. This suggests that Gewerbeschulen were not placed in areas with otherwise strong economic growth prospects during the First Industrial Revolution in Germany. However, we find that a town close to an additional Gewerbeschule was about 5 percent more likely to experience a manufacturing establishment opening between 1860 and 1879 than a town far from Gewerbeschulen. This effect is one-fifth of the unconditional mean.

Taken together, the evidence presented in figure 1 suggests a strong causal relationship between Gewerbeschulen and manufacturing establishment openings. First, in the panel regression we can control for unobserved time-invariant location advantages. Second, the negative point estimates for the 1820-1839 period shows that Gewerbeschulen were not established in places that already experienced strong manufacturing growth. Last, the strongest positive effects of Gewerbeschulen coincide with the start of Second Industrial Revolution in Germany, the time when the skills taught at Gewerbeschulen were particularly valuable.

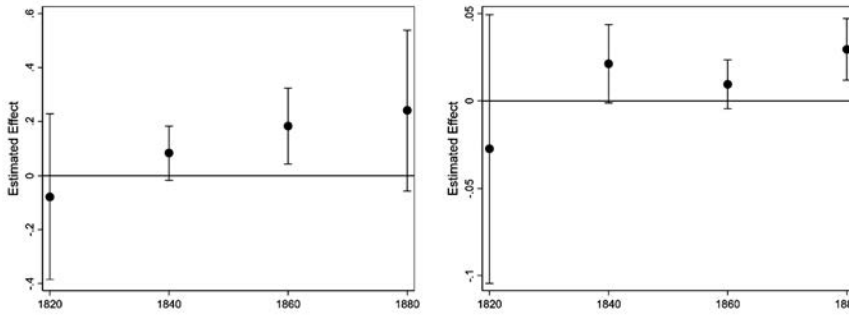
Next, we investigate the effect of Gewerbeschulen on inventive activity. Specifically, we assess whether there were more scientific breakthroughs recorded in the history of science literature. The data were originally collected by Dittmar and Meisenzahl (2022) and are based on Darmstaedter, du Bois-Reymond, and Schaefer's (1908) Handbuch zur Geschichte der Naturwissenschaften und der Technik, which catalogues major inventions and discoveries in our period. In addition to pure science breakthroughs, the authors also record early technology prototypes and the adoption or installation of commercially viable technologies---that is, the types of inventions and discoveries that we expect from inventors with technical training.

As with manufacturing, we study the timing of the effect of the Gewerbeschule on local invention using a flexible specification that allows us to capture the time-varying effect in 20-year intervals, and we estimate the following regression:

$$(3) \quad invention_{it} = \sum_{s=1820}^{1880} \beta_s \left(Gewerbeschule_i * time_s \right) + \sum_{s=1760}^{1880} \tau_s \left(university_i * time_s \right) + \gamma_i + \delta_t + \varepsilon_{it}$$

where the city-time-period level outcome variable is the number of inventions recorded in Darmstaedter, du Bois-Reymond, and Schaefer (1908). We interact our main explanatory variable $Gewerbeschule_i$, which is the number of Gewerbeschulen that a city is close to (within 25 km of). As before, we control for whether the cities are close to a university (within 25km). As before, we saturate the model with territory-time fixed effects (δ_t) to account for the overall growth and confounding changes on the territory level in a territory-time period as well as town fixed effects (γ_i) to control for unobserved, time-invariant location advantages.

Figure 2: Time-varying Effect of Gewerbeschulen on Invention



a) Total Inventions b) Any Invention

Figure 2 shows the results from estimating equation (3). The left panel, plotting the point estimates and the respective 90 percent standard error bands, shows that after the Gewerbeschulen were established, local invention differentially increased relative to towns not close to Gewerbeschulen between 0.08 and 0.24 inventions per city-period and somewhat smaller than the university effect on invention reported in Dittmar and Meisenzahl (2022). These results are still economically meaningful compared to a sample average of about 0.4 inventions

per city-time period. The right panel shows that cities within 25km of an additional Gewerbeschule were up to 2-3 percent more likely to produce any invention in the later time periods. Given the average probability to observe an invention in a city during these time periods was about 4 percent, the estimated effect is large.

Taken together, the evidence presented above suggests the Gewerbeschulen produced skilled engineers and workmen that fostered economic growth through the establishment of new businesses and invention. As such, Gewerbeschulen produced precisely the type of upper tail human capital that Mokyr (2009) originally had in mind, namely part of the top 3-5 percent of the skill distribution.

To be clear, Gewerbeschulen were not the only factor in the formation of upper tail human capital in historical Germany during the Second Industrial Revolution. First, Prussia had implemented a series of school reforms and had reasonably high levels of elementary schooling by the middle of the 19th century (Becker, Hornung and Woessmann 2011). Moreover, as part of the school reforms, a new type of school, Realschulen, that did not teach Latin and Ancient Greek, but English emerged (Friederich 1987). Last, the apprenticeship system was overhauled. Apprentices had to take additional classes and Innungen, the successors of the guilds, set minimum education standards and conducted exams (Thelen 2004). While some of these institutions may in themselves may have produced upper tail human capital, some, especially widespread literacy, and secondary education were a precondition for attending a Gewerbeschule and hence should be seen necessary complementary factors in the German context.

4. Conclusions

Upper tail human capital was also crucial for the German catch-up during the late stage of the First Industrial Revolution and for propelling Germany into a leadership position in several industries during the Second Industrial Revolution. However, different from the British bottom-up approach through flexible apprenticeship arrangements, the Prussian/German approach to the production of upper tail human capital was top-down. Enlightened bureaucrats created an educational system originally designed to prepare the most qualified candidates for a position in civil service and the military. These institutions focused on technical skills that were also highly valuable in industry. While perhaps partly an unintended consequence of the education reforms, the top-down approach ensured a significant supply of upper tail human capital for the German industry.

The German experience appears to provide more general insights about upper tail human capital, its supply, and importance for economic development. More recent history also suggests that creating the educational institutions that produce upper tail human capital and directing talent to these institutions can help countries in their economic development. The rapid catch-up of South Korea in first educational attainment and then in economic development is a prime example. However, one should be cautious and not interpret these insights as a call for a focus solely on science and engineering. After all, as Mokyr (2005) points out, the intellectual origins of the Industrial Revolution and their philosophical background, both of which are outside the STEM fields, were crucial for industrialization to occur. Moreover, recent research highlights the fragility of growth driven by the upper tail when the political and institutional settings become hostile to that upper tail (Waldinger 2016), suggesting that research outside the STEM fields is important for the long-run institutional equilibrium that supports economic growth.

References

Acemoglu, Daron, Davide Cantoni, Simon Johnson, and James A. Robinson. 2011. "The Consequences of Radical Reform: The French Revolution." *American Economic Review* 101 (7):3286-3307.

Becker, Sascha O., Erik Hornung, and Ludger Woessmann. 2011. "Education and Catch-up in the Industrial Revolution." *American Economic Journal: Macroeconomics* 3: 92–126.

Ben Zeev, Navad, Joel Mokyr, Karine van der Beek. 2017. "Flexible Supply of Apprenticeship in the British Industrial Revolution." *Journal of Economic History* 77(1), 208-250.

Berg, Maxine and Pat Hudson. 2021. "Slavery, Atlantic trade and skills: a response to Mokyr's 'Holy Land of Industrialism.'" *Journal of the British Academy* 9, 259–281.

Cinnirella, Francesco, Erik Hornung, and Julius Koschnick. 2022. "Flow of Ideas: Economic Societies and the Rise of Useful Knowledge." *CESifo Working Paper* 9836.

de la Croix, David, Frederic Docquier, Alice Fabre, and Robert Stelter. 2023. "The Academic Market and the Rise of Universities in Medieval and Early Modern Europe (1000-1800)." *Journal of the European Economic Association*.

de la Croix, David, Matthias Doepke and Joel Mokyr. 2018. "Clans, Guilds, and Markets: Apprenticeship Institutions and Growth in the Preindustrial Economy." *Quarterly Journal of Economics*133(1), 1–70.

Darmstaedter, Ludwig, Rene du Bois-Reymond, and Carl Schaefer. 1908. *Handbuch zur Geschichte der Naturwissenschaften und der Technik*. Berlin: Springer.

Dittmar, Jeremiah E. and Meisenzahl, Ralf R. 2020. "Public Goods Institutions, Human Capital, and Growth: Evidence from German History." *Review of Economic Studies* 87(2):959-996.

Dittmar, Jeremiah E. and Meisenzahl, Ralf R. 2022. "The Research University, Invention, and Industry: Evidence from German History." *FRB of Chicago Working Paper* No. 2022-24.

Donges, Alexander and Felix Selgert. 2019. "Do Legal Differences Matter? A Comparison of German Patent Law Regimes before 1877." *Jahrbuch fuer Wirtschaftsgeschichte* 60 (1):57-92.

Forberger, Rudolf. 1958. *Die Manufaktur in Sachsen vom Ende des 16. bis zum Anfang des 19. Jahrhunderts*. Berlin: Akademie-Verlag.

Forberger, Rudolf. 1982. *Die Industrielle Revolution in Sachsen 1800-1861*. Berlin: Akademie-Verlag.

Friederich, Gerd. 1987. "Das niedere Schulwesen." *In Handbuch der Bildungs-*

geschichte Band III, edited by Karl-Ernst Jeismann and Peter Lundgreen, 123–51. Munich: C. H. Beck Verlag.

Friedlaender, Gottlieb. 1854. *Die Koenigliche Allgemeine Kriegs-Schule und das hoehere Militair-Bildungswesen 1765-1813.* Berlin: Mittler und Sohn.

Hanlon, W. Walker. 2022. "The Rise of the Engineer: Inventing the Professional Inventor During the Industrial Revolution." *NBER Working Paper* No. 29751.

Harney, Klaus. 1987. "Fortbildungsschulen." In *Handbuch der Bildungsgeschichte Band III*, edited by Karl-Ernst Jeismann and Peter Lundgreen, 281–92. Munich: C. H. Beck Verlag.

Jacobi, Victor. 1842. *Nachrichten über das Gewerbeschulwesen in Preußen und Sachsen, auch Stuttgart, Nürnberg und Karlsruhe.* Leipzig: Adolph Wienbrad Verlag.

Jeismann, Karl-Ernst. 1969. *Staat und Erziehung in der Preussischen Reform 1807–1819*. Goettingen: Vandenhoeck & Ruprecht.

Kelly, Morgan, Joel Mokyr, and Cormac Ó Gráda. 2023. "The Mechanics of the Industrial Revolution." *Journal of Political Economy*131(1), 59-94.

Keyser, Erich. 1939-1974. *Deutsches Städtebuch*. Stuttgart: Kohlhammer.

König, Wolfgang. 2006. "Vom Staatsdiener zum Industrieangestellen: Die Ingenieure in Frankreich und Deutschland 1750–1945," In *Geschichte des Ingenieurs: Ein Beruf in sechs Jahrtausenden*, edited by Walter Kaiser and Wolfgang König, 179–232. Munich: Claus Hanser Verlag.

Lundgreen, Peter. 1987. "Fachhochschulen." In *Handbuch der Bildungsgeschichte Band III*, edited by Karl-Ernst Jeismann and Peter Lundgreen, 293–305. Munich: C. H. Beck Verlag.

Meisenzahl, Ralf R. 2015. "How Britain Lost its Competitive Edge: Competence in the Second Industrial Revolution," in *Institutions, Innovation, and Industrialization: Essays in Economic History and Development*, edited by Avner Greif, Lynne Kiesling, and John V.C. Nye. Princeton: Princeton University Press, pp. 307-336.

Meisenzahl, Ralf R. and Joel Mokyr. 2012. "The Rate and Direction of Invention in the British Industrial Revolution: Incentives and Institutions." in *The Rate & Direction of Inventive Activity Revisited*, edited by Josh Lerner and Scott Stern, 433–79. Chicago: University of Chicago Press.

Mitch, David. 1998. "The Role of Education and Skill in the British Industrial Revolution." In *The British Industrial Revolution: An Economic Perspective,* 2nd ed., edited by Joel Mokyr, 241– 79. Boulder, CO: Westview Press.

Mitch, David. 2004. "Education and Skill of the British Labour Force." In Vol. 1

of *The Cambridge Economic History of Modern Britain*, edited by. Roderick Floud and Paul Johnson, 322–56. Cambridge: Cambridge University Press.

Mokyr, Joel. 2002. *The Lever of Riches*. New York and Oxford: Oxford University Press.

Mokyr, Joel. 2005. "The Intellectual Origins of Modern Economic Growth." *Journal of Economic History* 65 (2):285-351.

Mokyr, Joel. 2009. *The Enlightened Economy: An Economic History of Britain 1700–1850.* New Haven and London: Yale University Press.

Mokyr, Joel. 2016. *A Culture of Growth: The Origins of the Modern Economy*. Princeton: Princeton University Press.

Mokyr, Joel, Assaf Sarid, and Karine van der Beek. 2022. "The Wheels of Change: Technology Adoption, Millwrights and the Persistence in Britain's Industrialisation." *Economic Journal* 132(645):1894–1926.

Mowery, David C. 2012. "The Rate and Direction of Invention in the British Industrial Revolution: Incentives and Institutions: Comment" *In The Rate & Direction of Inventive Activity Revisited*, edited by Josh Lerner and Scott Stern, 479-82. Chicago: University of Chicago Press.

Nuvolari, Alessandro, Bart Verspagen, and Nick von Tunzelmann. 2011."The early diffusion of the steam engine in Britain, 1700–1800: a reappraisal." *Cliometrica* 5: 291–321.

Rosenberger, Lukas. 2023. "Access to Useful Knowledge and Economic Growth: Evidence from Enlightenment Encyclopedias." Working paper, Ludwig-Maximilian University Muenchen.

Schiersmann, Christiane. 1979. *Zur Sozialgeschichte der preussischen Provinzialgewerbeschulen im 19. Jahrhundert*. Weinheim: Beltz Verlag.

Schulze, Hagen. 1999. "The Prussian Reformers and their Impact on German History" in *Reform in Great Britain and Germany 1750–1850* edited by T. C. W. Blanning and Peter Wende. 61-77. London: Proceedings of the British Academy.

Squicciarini, Mara P. and Nico Voigtländer. 2015. "Human capital and industrialization: Evidence from the age of enlightenment." *Quarterly Journal of Economics* 130(4): pp. 1825–1883.

Thelen, Kathleen A. 2004. *How Institutions Evolve: The Political Economy of Skills in Germany, Britain, the United States, and Japan.* Cambridge: Cambridge University Press.

Waldinger, Fabian. 2016. "Bombs, Brains, and Science: The Role of Human and Physical Capital for the Creation of Scientific Knowledge." *Review of Economics and Statistics* 98(50):811-831.

Willett, Olaf. 2001. *Sozialgeschichte Erlanger Professoren: 1743-1933*. Goettingen: Vandenhoeck und Ruprecht.

Zahedieh, Nuala. 2021. "Britain's Atlantic slave economy, the market for knowledge and skills, and early industrialisation: a response to Joel Mokyr's 'Holy Land of Industrialism'." *Journal of the British Academy* 9:283–293.

Using the Mokyrian Cultural Lens to Understand Gender Norms and Their Economic Implications

Rosemarie Fike[1]

1. Introduction

In *A Culture of Growth* (2016), Mokyr explores the essence of culture and builds a framework for understanding what culture is, what it does, and how it changes. In this essay, I use the cultural framework that Mokyr develops in his book to examine other aspects of culture – specifically culture as it relates to gender norms and their impact on women's economic choices. Within economic history and labor economics, there is a literature on the changing role of women in the economy (and society). This topic has been recognized recently with the awarding of the 2023 Nobel Memorial Prize in Economics to Claudia Goldin, who has committed her career to understanding women's labor market outcomes (in this volume also see chapter 9 for a discussion of Goldin's work).

Women's economic choices have changed dramatically over time, and especially in the 20th and 21st centuries. I argue that Mokyr's four catalysts for cultural change that ultimately bring about the Industrial Revolution can also be considered as forces that help to bring about reform and increased economic freedom for women. In the 20th and 21st centuries (focusing on the United States), (1) cultural entrepreneurs pushed the boundaries of what was considered the proper role of women in society, (2) new knowledge and technology made it easier for women to pursue opportunities (by reducing the costs of childbearing, for example), (3) institutional fragmentation and competition supported greater

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political and economic freedom, and (4) women's social networks and associations helped to bring forth increased freedom for women (in both informal and formal ways, e.g. protesting for particular rights).

The remainder of this essay proceeds as follows: Section II summarizes Mokyr's definition of culture and situates it within other economic discussions of culture. Next, in section III, I identify the factors that Mokyr discusses as the driving forces behind the shift in culture leading up to the Industrial Revolution. Section IV discusses gender norms and how they fit within Mokyr's cultural framework and identifies some parallel forces that have been the drivers behind some major shifts in gender roles that have taken place throughout history. These examples are illustrated with references to several case studies that have appeared in the literature on women and economic participation. Finally, section V concludes by offering a set of research questions related to gender and economic progress that could be further understood by applying a Mokyrian cultural lens.

2. Culture in the Economics Literature

What is culture and why does it matter? Seen as the domain of anthropologists and sociologists for many decades, economists deliberately steered clear of that question, and most any other question related to culture. To understand the universal economic truths around us, economic models have largely been devoid of cultural contexts.

There have been some notable exceptions to these treatments of culture in economics in recent years. Deirdre McCloskey's *Bourgeois Virtue*s (2006) explores the ways in which a system of natural liberty allows for the development of certain ethical and moral values and how the spread of these values helps us achieve a greater degree of human flourishing.

In *Understanding the Culture of Markets* (2013), Virgil Storr views culture as a pattern of meanings shared by a group of people, writing "(r)eality is processed through the lens of culture. As such, different cultural lenses can and do give rise to different conceptions of the good, different economic choices and so different economic outcomes" (ibid.: 4). In doing so, Storr draws a connection between the internal cultural lens we possess and the choices we are willing to make and how we interact with the world and those around us. He encourages economists to give culture due consideration, without abandoning rational choice and other tools of economic analysis.

Similar to Storr, Mokyr (2016) takes seriously the call for economists to study culture in a more methodical way. He identifies three distinct but interrelated parts and in doing so, provides a systematic way of understanding exactly what culture is and how it affects our economic decisions. Mokyr defines culture as "a set of beliefs, values, and preferences, capable of affecting behavior, that are socially (not genetically) transmitted and that are shared by some subset of society" (ibid.:8).

Beliefs are the ideas that people hold to be true about the world around us. These encompass a variety of claims about our physical surroundings, social interactions and relationships, or even what future paths may be possible or available to us. Values are ideologically grounded. They are normative, more often thought of as ethical, judgements we make about the way people ought to behave and interact within society. Lastly, preferences is an economic term that is often used, but rarely unpacked, and refers to normative positions relating to an individual's consumption and personal matters (ibid.).

In addition to these three elements, culture involves social learning. It is acquired from others. This is the evolutionary aspect of culture – the transmission of it from one generation to the next through socialization. Socialization occurs through direct imitation, often unconsciously so, or through symbolic means—spoken and written language, images, and examples. Depending on the broader institutional context, elements of culture compete with one another and aspects of culture can be weeded out over time and supplanted by new beliefs, values, and preferences.

Where some economists, such as Douglass North and Avner Greif, express culture as another type of institution, though an informal one, that can constrain and interact with more formal institutions, Mokyr draws a distinction between these two things. Institutions are bestowed upon us and are common to all people, and they shape the costs and benefits (the incentives). Culture, however, is something "*entirely of the mind*, which can differ from individual to individual and is, to an extent, a matter of individual *choice*" (ibid.: 9). Everyone has some degree of choice as to which beliefs, values, and preferences they hold as well as which ones they transmit to the next generation.

As economic historian and proponent of incorporating culture into analysis, David Landes states, "culture does not stand alone… the determinants of complex processes are invariably plural and interrelated" (1998: 517). Mokyr's work also emphasizes the idea that culture is entangled with institutions in that it provides the foundations upon which institutions can gain legitimacy. In other words,

the very incentive structure of society rests on a bedrock of ideas - what people believe, what they know, and what they think they know.

Similarly, Boettke et al. (2008) develop a model of "institutional stickiness" to understand the conditions under which changes in formal or informal institutions are stable and sustainable. Their model incorporates culture, what they refer to as *mētis*, which is "characterized by local knowledge resulting from practical experience. It includes skills, culture, norms, and conventions, which are shaped by the experiences of the individual" (ibid.: 338). From this, they argue that institutional changes that emerge from within that society and are in sync with that society's *mētis* are more likely to be stable and sustainable, while the externally imposed institutional changes that are at odds with culture are more likely to fail. Culture is a crucial part of the economic puzzle that if ignored, can result in policy recommendations that have dire unintended consequences.

Figure 1. depicts the relationship between institutions, culture, and individual choice to capture the dynamics discussed in the literature.

Figure 1: Institutions, Culture, and Choices

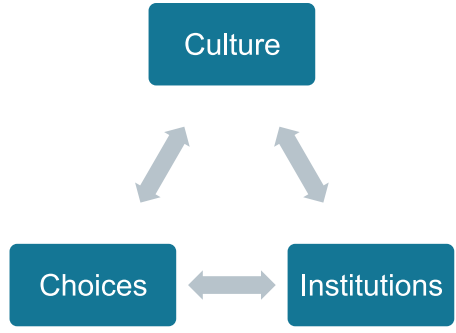

Figure 1 highlights the important insight that each of these factors affects the others, and these relationships do not flow in only one direction. Both institutions and culture shape the choices that individuals make by affecting the costs and benefits that they are faced with as well as altering some of the constraints that people face. The direct inclusion of choice in this framework also emphasizes that each individual has some autonomy over which rules they abide by and which ones they break (though these choices are shaped by the punishment structure), which beliefs, values, and preferences they accept, challenge, and pass on to other

generations. Individuals can make choices that alter both formal and informal rules, and they can make deliberate choices to alter culture.

3. Four Catalysts for Cultural Change

Mokyr (2016) identifies four major factors that contributed to a shift in culture that helped bring about the Industrial Revolution, and in turn, cultivate economic prosperity in much of the world. These four factors are: cultural entrepreneurs, shocks of new knowledge and technology, an institutional environment that allows for competition over formal rules, and an intellectual environment that encourages people to develop, share, and contest scholarly ideas.

3.1 Cultural Entrepreneurs

Mokyr suggests that cultural entrepreneurs are "the individuals who successfully contested and overthrew existing authorities in a specific area of culture and created a competing variant" (2016: 60). Like traditional entrepreneurs are the catalyst for discovering newer and better ways of allocating economic resources and correcting for errors in the market process, cultural entrepreneurs develop and help others adopt new sets of beliefs, values, and preferences that have far reaching consequences regarding the economic choices we are willing and able to make. Cultural entrepreneurs work to persuade others that these intellectual and cultural shifts are both possible and beneficial.

One function of cultural entrepreneurs is to add new options to the array of cultural choices available to us. This can be done by making choices that cut against the dominant culture in a way that is visible to others who in turn contemplate the possibility of making a similar choice. In addition, cultural entrepreneurs develop ways to relax both formal and informal constraints so that people feel more comfortable making choices they may not have made in the past. The costs they seek to reduce are not simply material or economic costs, but they also include the psychological costs associated with challenging beliefs that are commonly held by the majority. They act as both a cultural innovator and as a social coordinator encouraging people to converge on a new set of beliefs, values, and preferences.

Mokyr's identifies several historical figures as cultural entrepreneurs including Francis Bacon (2016, chapter 7), Isaac Newton (ibid, chapter 8), Martin Luther,

John Maynard Keynes, Karl Marx, Jesus, and Charles Darwin. What is most important, however, is that there is a market for ideas that allows cultural entrepreneurs to emerge.

3.2 Shocks of New Knowledge and Technology

Economists often think about technology as the set of recipes we have for transforming scarce resources found in the natural world around us to satisfy a variety of competing ends. Improvements in technology make both our tools and our labor more productive. Advancements in knowledge and technology, combined with a willingness to embrace and discover new ways of doing things, go a long way towards improving living standards. Less attention is paid to the ways in which technological advancements also shape our culture.

3.3 Political Fragmentation and Competition

While Mokyr is careful to distinguish culture from institutions, he does highlight the importance of the broader institutional setting as a potential constraint on cultural change. Specifically, he points to the fragmented, or polycentric, political order of Western Europe as one that allowed for new beliefs, values and preferences to emerge over time (see especially chapter 11, 2016). In this type of competitive institutional context, people are more able to explore their ideas without fear of being persecuted or killed, as they could exit an oppressive environment for one that is more open to their ideas. Formal rules that were more open and competitive made it difficult for governments to stand in the way of the spread of knowledge –as they, very importantly, provided ample opportunities for people to exit.

This also speaks to economic freedoms, not just political ones. Rules that grant people the permission to move to a place with rules and opportunities that they prefer and the freedom to determine how to spend their time, who to interact with, and whether to pursue a new business idea. An institutional context that allows people to test out new ways of living their lives is one that seems more open to discovering and embracing new beliefs, values, and preferences as they relate to all manners of human interaction, including gender norms.

3.4 The Republic of Letters: A Competitive Network to Challenge and Spread Ideas

The fourth factor that Mokyr identifies as creating the cultural context of growth is The Republic of Letters, a network of educated individuals who were regularly in contact with one another, sharing ideas, collaborating, and critiquing one another throughout the 15th – 17th centuries in Europe. This intellectual community had explicit rules governing intellectual innovation such as publishing and sharing one's discoveries and crediting the scholars whose work you build upon. In short, it acted as a marketplace for ideas to compete with one another as well as a means to spread new ideas to those who can then offer challenges or extend the ideas into new directions.

Part of the importance of this community of scholars is that "it overcame the limitations of fragmentation by providing the intellectual innovator with a much larger audience than his or her own countrymen" (ibid.: 179). In addition, this network of scholars generated rules and incentives that encouraged high-performing scholars and artists. This network created a means for intellectual innovators to build their reputation and gain accolades from their peers, and at the same time meet the favor of wealthy patrons.

Together, these four catalysts for cultural change acted to reduce the barriers associated with making certain choices as well as expand the set of beliefs, values, and preferences from which people can choose in the first place. Section IV, of this paper will explore further how these four factors also play a role in shifting gender norms.

4. Gender Norms within the Mokyrian Cultural Lens

There is an opportunity to incorporate a richer description of culture within the growing literature on women's role in the economy. Much of the literature on gender performance gaps in the labor market attributes these gaps to systematic differences in the voluntary choices that men and women make when it comes to human capital investments and work arrangements (Becker 1985; Goldin 1990; and Blau and Kahn 2017).

What is also important, but often overlooked by economic models, is that our real-world choices are *always* influenced by the specific set of formal and informal institutional arrangements and cultural environment. The institutional

and cultural context shapes the individual chooser's perceived costs and benefits of the options that are available, and this in turn affects the voluntary choices they make. Shifts in institutions or culture will alter these perceived costs and benefits and inevitably lead to a different pattern of choices.

To fully understand what drives observed gender differences in any particular outcome, it is not enough to attribute the outcomes to voluntary choice. One must go further and incorporate discussions of both institutions and culture as it relates to gender roles. The cultural framework that Mokyr offers provides a promising tool that can be used to study gendered aspects of culture, and their impact on our choices with more clarity. This approach is appropriate, since gender norms fit well within the definition of culture Mokyr provides. Exploring the set of beliefs, values, and preferences regarding the appropriate roles for men and women in society in a systematic way can help us understand why we observe the economic outcomes that we observe, as well as what factors might be conducive to changing those outcomes.

First, the broader culture of a society includes many gendered beliefs regarding what truths exist about the world. For example, claims that men are physically stronger than women, or that women are more risk averse than men fall into this category. Additionally, there are physiological differences between men and women and some of these differences affect who has the comparative advantage in childcare during the very first stages of a child's life, especially in societies with limited access to the technological developments that make these physiological differences less important.

Second, it is easy to identify a wide array of values that reflect society's normative positions about how people of all genders *ought to* behave. Many of which include judgments about the moral character of the individual. These include positions like men who cry or show emotions (other than anger) are weak, a man that does not provide financially for their family is failing at his duties, women who *choose* not to have children are selfish, or a mother who works full-time is not doing right by her children.

Preferences are normative statements about individual matters such consumption and personal affairs. While preferences are subjective and unobservable, we can observe the choices that people make. Through these revealed preferences, we can come to understand some overarching cultural trends related to gender roles. For example, looking at differences in the patterns of consumption, employment, education, and household division of labor across

different genders can give us some insight into issues such as whether certain jobs are seen as inappropriate for women or whether most people believe that men make better political leaders.

While gendered aspects of culture undoubtedly vary from society to society, some common themes emerge in the literature regarding the behaviors that are considered "masculine" or "feminine."[2] For example, in his 1991 cross-cultural study of what it means to be a man, anthropologist David Gilmore articulated a small set of characteristics that defines manliness and are shared across a wide range of different cultures. Gilmore's "Ubiquitous Male" is one that acts as "Man-the-Impregnator-Protector-Provider" (1991: 223). In other words, across many cultures there are social expectations that men father children, be physically strong enough to protect their families, and be able to provide their families with material well-being. In studies of femininity, there are recurring themes of the archetypical woman in the role of mother - the nurturing caregiver whose domain is the home and whose priority is to serve others (Parent et al. 2020).

Table 1 depicts several examples of gendered aspects of culture and how they fit within the three sub-categories that comprise the Mokyrian cultural framework. While the examples in this table are largely specific to the US context, they are illustrative of how Mokyr's cultural framework can be applied to study gender norms.

2 While this paper focuses on the dominant binary categorization of gender, it is important to recognize that this approach is not ubiquitous. There are many cultures that recognize alternative conceptions of gender including the "two-spirit" designation that stems from the culture of some indigenous North American tribes, such as the We'wha of the Zuni tribe and the Osh-Tisch of the Crow nation. In South Asia there are the hijras, the Hawaiians and Tahitians have the māhū, the Polynesians have the fa'afafine, and the Balkans have the sworn virgins. The same approach used here can, and should, be appiled in the future to study gender categories beyond the male/female binary to understand the unique roles socially assigned to each.

Table 1: Gendered Aspects of Culture - Examples and Corresponding Mokyrian Categories

Beliefs: *ideas that people hold to be true about the world around them.*	***Values***: *ideological judgements people make about the ethical or moral nature of peoples' behavior.*	***Preferences***: *subjective desires about one's consumption decisions and personal matters.*
On average, men are physically stronger than women.	Men who cannot physically protect their families, are weak.	In the U.S. the majority of people who choose to participate in military (82.5%) and law enforcement careers (85%) are male (Department of Defense 2022; and Brooks 2022).
Women have a comparative advantage in caring for children stemming from their physiological characteristics.	Women who choose not to have children are selfish or denying their nature. Pope Francis has repeatedly expressed the sentiment that couples who are child free are choosing a selfish path stating that this denial of fatherhood or motherhood diminishes us, it takes away our humanity. (Berlinger 2022).	As of 2008, 18% of women between ages 40 and 44 have never had children, (Taylor et al. 2010). While this number is significantly higher than the 10% of women in this age range who never had children in 1978, it is still the case that the vast majority of women choose to have children.
Women's comparative advantage in child rearing also gives them a comparative advantage in other forms of household labor.	Women who work full time are worse mothers than those who take time off to care for their children.	Women self-select into more flexible work arrangements that allow them to be primary caregivers. According to one UK study, women are three times more likely to have a flexible work arrangement than men (The Trades Union Congress 2022). Working women devote more time to care work than their working husbands, even when their earnings are similar (Fry et al. 2023).
Men have a comparative advantage in working outside of the home.	Men who cannot provide financially for their families are failures.	Male-female couples who have children tend to prioritize the career of the male partner. In the US, 55% of male-female marriages are ones where the sole income is earned by the husband, and only 16% are ones where the woman is the sole earner (Fry et al. 2023).
On average, women are more emotional and empathetic than men (Parent et al. 2020)	As of 2019, 13% of Americans held the opinion that women are too emotional to hold political leadership positions (Carnavale et al. 2019). A 2018 Pew Research study also found that 49% of Americans believe that gender discrimination is a major factor limiting women's political representation (Parker et al. 2018).	Women make up 28.2% of US Congress (Center for American Women and Politics 2024) and 10.6% of CEOs of Fortune 500 Companies (Schaeffer 2023)

Finally, Mokyr's cultural framework emphasizes how gender norms are socially transferred across generations, not genetically inherited. That is not to say that biological factors play no role in shaping gender norms. There are obvious physiological differences between men and women that certainly influenced the way gendered aspects of culture have evolved over time. However, no one is born with preconceived notions of what gender roles look like. Those beliefs, values, and preferences are shaped through our personal observations and social interactions, and they evolve as we move through our lives.

The interactions we have with our families and the dynamics we observe within that family structure are among the first to shape our personal conception of gender roles. Whether our mothers and aunts worked outside of the home, our fathers and brothers helped with the housework and childcare, or our sisters were praised for their intellect instead of their looks will alter our perception of what is expected of us in accordance with our gender identity and the broader cultural perceptions of gender roles. During holiday gatherings, what kind of examples do we set for the little ones in our lives? Does everyone help with the cooking and the clean-up, or is that work being done only by the women?

Gender norms are further shaped by the interactions we have with peers outside of our families as well as the dynamics we observe as we participate in the market, in schooling, in our religious lives, and in other social settings. It is even influenced by the kind of gender representation we see in the media we consume.

What do gender roles look like in the literature we read, the television and movies we watch and the music we listen to? What kind of jobs are the female characters doing? How do men treat their wives? How involved do the fathers seem with their children? Each of these things communicate a specific message about the choices men and women are expected to make. Each of these things influence the beliefs, values, and preferences people hold regarding gender issues.

5. Four Catalysts for Shifting Gender Norms

An important next step in understanding gender norms as a cultural phenomenon is thinking about how our gendered beliefs, values, and preferences can change.

5.1 Cultural Entrepreneurs

Changes in gender norms, like changes in other aspects of culture, will require the involvement of cultural entrepreneurs to help shift peoples' perceptions of what is considered appropriate for men and women. Examples of modern cultural entrepreneurs striving to do this include people like Geena Davis (through the creation of the Geena Davis Institute) and Reese Witherspoon, who have worked to change the way women are represented in the television shows and movies that we watch. Both of these women have production companies that prioritize telling stories about women, written by women, that are focused on sharing women's experiences. By changing how people see women on screen, they are attempting to change our social narratives about what women are capable of becoming and accomplishing.

Another notable cultural entrepreneur who has worked to change the set of options available to women is Malala Yousafzi, a Pakistani woman who was the target of the Taliban for taking a school exam. The Taliban member who shot her in the head was in effect sending a message to women who tried to obtain an education despite the Taliban's bar on girls attending school. After surviving this assassination attempt, Malala went on to become the youngest recipient of the Nobel Peace Prize and continues her global work as an activist who advocates for women's right to an education.

Cultural entrepreneurs pushing the boundaries of gender norms can also be found within the economics profession. Elinor Ostrom, the first woman to win

the Nobel Memorial Prize in Economics, was met with significant professional and personal resistance as she embarked on her career. She was denied admittance into PhD programs because it was considered a waste of departmental resources to fund a female graduate student, she had difficulty finding academic positions that enabled her to focus on her research, and her first husband was so disproving of her choice to pursue her graduate degree that he divorced her (Lemke 2022). Ostrom's persistence in the face of these obstacles and the important contributions she made to both economics and political science helps inspire countless women and serves to alter broader perceptions about what women may be capable of contributing to a male-dominated field.

The set of cultural entrepreneurs certainly includes legendary boundary pushers, like the women mentioned above. However, cultural entrepreneurs also include individuals, whose names are lost to history, who chose to challenge gender norms in importantly ordinary ways in their daily lives and inspire others to do the same. From the elementary school teachers who intentionally challenge traditional gender roles in their interactions with students, to the senior managers who choose to mentor a new parent in the beginning stages of their career, these more subtle forms of cultural entrepreneurship help normalize options that may have seemed off limits in the past.

5.2 Shocks of New Knowledge and Technology

The discovery of new knowledge and the introduction of new technology can alter the constraints on our choices by enabling us to more productively use our time and other scarce resources. As a result of these changing constraints, new possibilities for gender roles emerge. As Bellavitis (2016: 21) highlights, "(t)echnological advances have always had consequences for gender roles in the workplace…"

Technological innovations have aided women's ability to complete household labor in less time and with less physical exertion, freeing them up to participate in formal employment. Advancements in technology have also increased women's ability to take control of their reproductive destinies. Birth control pills, intrauterine devices (IUDs), and access to abortion care have made it possible for women to focus on investing in their human capital and building their careers without unplanned pregnancies diverting their path.

Technological progress has also helped overcome the physiological differences

between men and women in a way that it is no longer obvious that women have a comparative advantage in childcare tasks instead of working outside of the home. With the existence of breast pumps, baby formula, and other child-rearing tools, men are equally capable of being the sole caregiver of children. Additionally, tools and equipment that aid in heavy lifting and other activities that require significant physical strength have made certain jobs (like construction) more accessible to women.

Technology also has made more flexible work arrangements a possibility in fields that previously required in-person work attendance. In a post-COVID-19 world, employers and workers now have access to, and are more comfortable using, virtual conferencing tools and other technological innovations that make remote and flexible work arrangements much more accessible. In the past, the increased availability of flexible work arrangements, like part-time work, made it easier for women to formally participate in the economy. With more industries offering employees the ability to work remotely at least part of the time, it will become easier for those acting in primary caregiver roles to make the choice to work for pay in a variety of professions that were seemingly off limits in the past.

5.3 Institutional Fragmentation and Competition

An institutional environment that allows people to challenge existing gender norms is crucial for enabling cultural change. Mokyr's framework suggests that certain institutional arrangements (namely polycentric political systems) permit this process of contestation which allows for alternative cultural perspectives to emerge and spread over time. Both political and economic institutions are important in this regard. Political freedom allows people to exit and find a new location that possesses institutions and a culture that better suits their preferences. When enough people choose to exit, this puts pressure on political actors to make changes to the rules in order to maintain their population (Tiebout 1956).

However, institutions consistent with economic freedom give people the permission to make choices that challenge gender norms without necessarily having to exit to do so. Are women able to freely move outside of their home? Are there restrictions on women's ability to choose where to live? Can women choose an occupation that appeals to them, start a business, own property, and open a bank account? Or are there significant laws and regulations that restrict how women can participate in the market? These formal economic rules matter and an institu-

tional environment consistent with economic freedom provides people with the permission to make choices that challenge existing beliefs, values, and preferences.

The idea that certain institutional contexts may be more conducive to generating social attitudes that are more consistent with gender equality has been explored to some degree empirically. For instance, Fike (2024) finds that countries that are more economically free (i.e. ones fewer of formal barriers preventing people from challenging the status quo) are less likely to have gender norms that prioritize men over women when it comes to obtaining employment, attending university, and pursuing political leadership opportunities.

5.4 The Republic of Women: Networks to Challenge and Shares Ideas

The final pillar of cultural change that Mokyr identified is a network through which people share knowledge, test out new ideas, and develop new ways of thinking. Women have long sought out alternative ways to participate in shaping the cultural and intellectual landscape when formal and informal barriers to their participation in such conversations left them limited. Through these efforts, women, along with their allies, have been able to catalyze cultural change that has opened doors for future generations through changing aspects of culture.

A notable example of such a network is the women's salons that were popular during the French Revolutionary period. The salons offered women an opportunity to sharpen their speaking and debate skills, to learn how to formulate and articulate an argument and stretch their minds in a way that was often considered inappropriate according to cultural norms. Beyond that, the salons gave women a chance to influence life outside the domestic sphere. Women at the time were not allowed to vote or hold political office, or to participate in the debates at the national assembly. Engaging in debates and discussions in the salon setting provided them a chance to influence political discourse.

Another example of networks that women used to share new ideas is found in civil society organizations. In her book, *Natural Allies: Women's Associations in American History*, Anne Firor Scott (1992) details the role that women's groups played in providing assistance to soldiers during the Revolutionary War. Similarly, Lemke and Norgaard (2019) discuss the use of women's social clubs to supply community-oriented public goods in the 19th century United States. These "club women" were responsible for constructing public sidewalks, building libraries,

coordinating fire-fighting services, offering medical and financial relief to poorer community members, revitalizing public spaces, pushing for local reforms, and providing many educational opportunities to both club members and the broader community. In addition to providing these benefits to their communities, these social clubs provided a space for women to gather, hear speakers discuss a variety of educational topics, and to develop and debate their own ideas about the world.

5.5 Application of the Mokyrian Framework to Case Studies

A re-examination of two cases found in the economic literature can further illustrate how the Mokyrian lens can be utilized to understand changing gender norms. The first case comes from Lemke (2016) and the second from Goldin (2021).

Case 1: Interjurisdictional Competition and Married Women's Property Rights Act

Lemke (2016) provides a detailed exploration of how women in the US acquired the legal right to own property in the 19th century. While Lemke's analysis primarily focuses on the interjurisdictional competition present among states and territories as the main driver of the shift in property rights laws, the other historical details discussed in the paper speak to a more comprehensive cultural shift that relied on each of factors Mokyr identified: cultural entrepreneurs, changes in the available knowledge and technology, political fragmentation and competition, and a network through which people exchange new cultural perspectives.

First, technological innovations changed the underlying constraints people faced. The development of the factory system in the Northern US, specifically the focus on mass-produced textiles, increased the demand for women's labor. In addition, the expansion of the railroad across the US and its territories made it less costly for people to move to where better opportunities might be available.

However, just because new work opportunities were available for women, did not mean that many were eager to fill them. Cultural entrepreneurs including both business owners and politicians worked to encourage women to take advantage of these new options. Employers, such as Francis Cabot Lowell, made significant investments in convincing young women and their families that the work was respectable, and that they would be in good care. Cultural entrepreneurs also

pushed for legal reforms that would give women a greater incentive to work outside of the home (i.e. granting women the legal right to own property and keep their own wages).

Additionally, the fragmented political institutions of the early US generated competition among different US states and territories for population. Politicians in western US territories who were trying to attract enough residents to formally be granted statehood needed to get women to move to their territory if they wanted to increase their numbers. They advertised in newspapers encouraging women to move west where there were plenty of available men to wed, but also laws that granted women more autonomy and economic freedom than other places they could choose to live. Lawmakers with a vested interest in attracting a large population competing with other lawmakers who are doing the same. In addition, rules that allowed for freedom of movement across the states and territories meant that residents had the ability to exit to a location offering rules that are better aligned with their personal preferences and goals.

Finally, women working in textile factories formed associative groups, many of which focused on improving their educational outcomes and developing skills beyond what they learn on the job and providing channels for these women to exert an influence on the broader community. Women who went to work in the factories as well as the ones who moved to the Western territories often sent letters home to their sisters and female friends discussing their experiences and the opportunities it provided. This network provided a channel through which women were able to share experiences and ideas about potential new paths for their lives. All of these factors worked together not just to extend the formal institution of property rights to women in the US, but also to expand the menu of options available in future generations.

Case 2: Career and Family: Women's Century-Long Journey Toward Equity

Goldin's *Career and Family* (2021) provides a historical examination of the factors that drove the major shifts in women's labor market decisions in the US. One of the key drivers she mentions is the shift in women's identity – which ultimately speaks to an underlying cultural change that help enable women to make different labor market choices than previous generations. While the book does not discuss any networks through which women exchanged new ideas about

their career possibilities (outside of university spaces), it does touch on the other three sources of cultural change that Mokyr identifies.

Throughout the book, Goldin mentions many cultural entrepreneurs including economist Margaret Gilpin Reid, who became a visible symbol to women entering male-dominated professions - adding to the list of options in young women's minds regarding which paths are feasible. Goldin states that what she "gained from Margaret was far more than just a role model from a distance. I gained a vision of what was possible and the desire to achieve what was lacking" (ibid.: 62).

While cultural entrepreneurs pushed for changes, Goldin also emphasizes the role that technological progress played in altering women's work choices. Time-saving household appliances and even the birth control pill altered women's constraints, providing them with more time to enter the work force and control over their fertility so they are less likely to take unplanned breaks from their education and careers.

Of course, the 20th and 21st centuries brought changes to the formal rules as well. Formal institutions needed to change to create the environment necessary to allow women to enter the workforce en masse. Marriage bars, laws that required working women to leave their jobs once they married, largely ended in the 1950s. This was partly due to court cases, but also because firms ceased enforcing those rules because they needed female worker to satisfy their demand for labor. The widespread acceptance of divorce and the creation of a no-fault divorce option allowed women to "exit" unhappy marriages but also increased the need for many women to find work.

6. *Concluding Thoughts on the Implications of Employing the Mokyrian Cultural Lens to Understand Gender Norms*

What do economists gain from incorporating a systematic analysis of culture into their discussions of gender issues? Several important insights into a variety of policy relevant questions emerge when culture becomes an explicit part of the analysis, as do a few new potential directions for scholarly research.

First, Mokyr's framework allows us to recognize the importance of the formal intuitions in enabling cultural change and experimentation. For change to take place, there needs to be rules that allow people to contest the existing cultural norms or escape to a different place with cultural norms they prefer. A polycentric system that embraces economic freedom and political freedom may offer such

a rule structure. In using this framework, we are in a better position to identify potential roadblocks that prevent cultural change from taking place. Specifically, laws that ban (or significantly raise the cost) of choosing to challenge existing norms will inhibit the process of spontaneous discovery of alternative norms that enable a more efficient use of resources.

For example, as of 2023 there were 59 countries in the world that have some formal law that dictates women are not permitted to pursue certain types of employment. These restrictions include limits on their ability to work at night, in occupations deemed morally corrupt or dangerous, or even work with chemicals or pesticides, or work in positions that are physically demanding (Fike 2024). While it might be the case that few women would readily choose to work in those settings in the absence of such bans, the ban itself makes it more difficult for a pioneering woman to act as a cultural entrepreneur and choose to enter these male-dominated fields. In such an institutional context, a higher cost is incurred when contesting the dominant view what kind of work is acceptable for a woman.

Additionally, there are 27 countries in the world that place restrictions on women's ability to move freely both within and outside of their country (ibid.). These laws include passport restrictions as well as guardianship rules that require male chaperones. These formal restrictions make it more costly for women to exit to a society with different formal rules and different cultural norms if they are unhappy with the ones they are living under. From a policy perspective, facilitating cultural change may involve taking steps to relax the formal rules that stand in the way of cultural entrepreneurs testing out new gender roles.

Secondly, when we make culture an explicit part of the discussion, we gain a deeper understanding of why laws and regulations intended to achieve gender parity have had such varied results where they have been attempted. These policies are intended to improve women's performance in the labor market, but it is incredibly difficult to predict how changes in a law or regulation will interact with the existing culture, making it a challenge to anticipate whether such rule changes will result in desirable or undesirable consequences.

For example, Sanandaji (2016) marvels at what he calls the Nordic gender-equality paradox. He points out the fact that despite implementing many family-friendly work policies and gendered labor market mandates (e.g. quotas for corporate boards), Nordic countries seem to trail other OECD nations when comparing gender performance gaps in the labor market (e.g., the gender gap in STEM fields, the percentage of women in management

positions, etc.). However, in places like the US, where there are none of these policies imposed at the national level, the gender-gaps in the same outcomes are a lot smaller. Similarly, Fike and Lemke (forthcoming) conduct a meta-analysis of the impact of gender quotas for corporate boards and conclude that the cultural context in which gender quotas are implemented matters. If, as Goldin's work suggests, gender norms stand in the way of narrowing gender gaps in the labor market, policies like quotas are merely treating the symptom without affecting the cause.

Mokyr's cultural framework also allows us to discuss culture in a way that is not deterministic, but rather capable of change so that intentional choices may encourage new cultural attitudes to emerge. There is an element of choice regarding which aspects of the existing culture to pass along to the next generation. In doing so, this perspective sets the stage for a meaningful conversation about how to talk to our children, the images we present to them, and other ways we can shed aspects of the existing culture that hinder certain groups, like women. Through intentional changes in our actions and the messages we communicate through our art and the products we sell, the cultural legacy we pass on to the next generation can take a different shape.

For example, the toys purchased for children are influenced by current gender norms, but they also help determine which gender norms get passed to the next generation. Girls are often socialized at a young age to engage in care work as they play with toy kitchens, baby dolls, and even toy vacuum cleaners. Boys are often encouraged to play with STEM-oriented toys like Lego, model rockets, or science kits. In recent years, stores like Target have eliminated the "boys" and "girls" labels on their toys sections to encourage children of all genders to choose toys that appeal to them regardless of whether earlier generations deemed those toys more appropriate for children of a different gender. This results in the emergence of different sets of gendered beliefs, values, and preferences.

Finally, the work that Mokyr has done in unpacking culture provides scholars with a useful, actionable framework that can be used to explore additional lines of inquiry related to a variety of aspects of culture- including gender norms. There are many opportunities for scholars to use Mokyr's framework to discover which conditions are necessary for changes in gender norms to occur, or why change may seem rapid in some instances and glacial in others. More broadly, this framework could help us understand why societies evolved to exhibit different gender norms in the first place, and whether there are any key factors (institutional or otherwise)

that explain cross-country differences in attitudes regarding the appropriate roles for men and women in society. What we gain from making culture an explicit part of our analysis is a richer understanding of the world around us.

References

Becchio, Giandomenica. 2024. *The Doctrine of the Separate Spheres in Political Economy and Economics: Gender Equality and Classical Liberalism.* Cham, Switzerland: Palgrave Macmillan.

Becker, Gary S. 1985. "Human Capital, Effort, and the Sexual Division of Labor." *Journal of Labor Economics* 3(1): S33–58.

Bellavitis, Anna. 2016. *Women's Work and Rights in Early Modern Urban Europe.* Cham, Switzerland: Palgrave Macmillan.

Berlinger, Joshua. 2022. "Opting for pets over children is selfish and 'takes away our humanity,' says Pope Francis." *CNN News.* Available from: https://edition.cnn.com/2022/01/05/europe/pope-dogs-cats-kids-intl/index.html

Blau, Francine D., and Lawrence M. Kahn. 2017. "The Gender Wage Gap: Extent, Trends, and Explanations." *Journal of Economic Literature* 55 (3): 789–865.

Boettke, Peter J., Christopher J. Coyne, and Peter T. Leeson. 2008. "Institutional Stickiness and the New Development Economics." *The American Journal of Economics and Sociology* 67(2): 331-358.

Brooks, Connor. 2022. "Federal Law Enforcement Officers, 2020 – Statistical Tables." *U.S. Department of Justice, Bureau of Justice Statistics NCJ 304752.* Available from: https://bjs.ojp.gov/document/fleo20st.pdf

Carnevale, Anthony P., Nicole Smith, and Kathryn Peltier Campbell. 2019. "May the Best Woman Win? Education and Bias against Women in American Politics." *Center on Education and the Workforce* Georgetown University. Available from: https://cew.georgetown.edu/wp-content/uploads/Women_in_Politics.pdf

Center for American Women and Politics. 2024. "Facts: Current Numbers." Available from: https://cawp.rutgers.edu/facts/current-numbers

Department of Defense. 2022. *2022 Demographics Profile of the Military Community.* Available from: https://www.militaryonesource.mil/data-research-and-statistics/military-community-demographics/2022-demographics-profile/

Fike, Rosemarie. 2024. "Economic Freedom and Gender Norms." Fraser Institute Policy Report. Available from: https://www.fraserinstitute.org/sites/default/files/economic-freedom-and-gender-norms.pdf

Fike, Rosemarie and Jayme Lemke. (Forthcoming). "Can Gender Quotas Help Break the Glass Ceiling?" *Independent Review*.

Fry, Richard, Carolina Aragao, Kiley Hurst, and Kim Parker. 2023. "In a Growing Share of U.S. Marriages, Husbands and Wives Earn About the Same." Pew Research Center. Available from: https://www.pewresearch.org/so-

cial-trends/2023/04/13/in-a-growing-share-of-u-s-marriages-husbands-and-wives-earn-about-the-same/

Gilmore, David. 1991. *Manhood in the Making*. Yale University Press.

Goldin, Claudia. 1990. *Understanding the Gender Gap: An Economic History of American Women*. Oxford University Press.

Goldin, Claudia. 2021. *Career and Family: Women's Century-Long Journey Toward Equity*. Princeton University Press.

Landes, David S. 1998. *The Wealth and Poverty of Nations: Why Some Are So Rich and Some So Poor.* New York, NY: W.W. Norton.

Lemke, Jayme. 2016. "Interjurisdictional Competition and the Married Women's Property Acts." *Public Choice* 166(3): 291 -313.

Lemke, Jayme. 2022. Elinor Ostrom (1933-2012). In Don Boudreaux and Aeon J. Skoble (eds.) *The Essential Women of Liberty*. (Fraser Institute): 107-121. <https://essentialscholars.org/sites/default/files/2023-01/essential-women-of-liberty-ch9-elinor-ostrom.pdf>, as of January 21, 2024.

Lemke, Jayme and Julia Norgaard. 2019. "Club Women and the Provision of Local Public Goods," In: Hall, Joshua and Marcus Witcher (eds.) *Public Choice Analyses of American Economic History Volume 3*, Studies in Public Choice, vol 39. Springer.

McCloskey, Dierdre N. 2006. *Bourgeois Virtue: Ethics for the Age of Commerce*. Chicago, IL: University of Chicago Press.

Mokyr, Joel. 2016. *A Culture of Growth: The Origins of the Modern Economy.* Princeton, NJ: Princeton University Press.

Parent, Mike C., Laurel R. Davis-Delano, Elizabeth M. Morgan, Nathaniel W. Woznicki, and Alish Denson. 2020. "An Inductive Analysis of Young Adults' Conceptions of Femininity and Masculinity and Comparison to Established Gender Inventories." *Gender Issues* 37(1): 1-24.

Parker, Kim, Juliana Menasce Horowitz, and Renee Stepler. 2017. "On Gender Differences, No Consensus on Nature vs. Nurture." Pew Research Center. Available from: https://www.pewresearch.org/wp-content/uploads/sites/20/2017/12/Gender-report-December-2017-FINAL.pdf

Parker, Kim, Juliana Menasce Horowitz, and Ruth Igielnik. 2018. "Women and Leadership 2018." Pew Research Center. Available from: https://www.pewresearch.org/wp-content/uploads/sites/20/2018/09/Gender-and-leadership-for-PDF_updated-10.1.pdf

Sanandaji, Nima. 2016. *The Nordic Gender-Equality Paradox: How Nordic Welfare States are Not Only Empowering Women, But Also (un)intentionally Holding Them Back.* Stockholm, Sweden: Timbro.

Scott, Ann Firor. 1992. *Natural Allies: Women's Associations in American History*. Chicago, IL: University of Illinois Press.

Schaeffer, Katherine. 2023. "The Data on Women Leaders." Pew Research Center. Available from: https://www.pewresearch.org/social-trends/fact-sheet/the-data-on-women-leaders/#fortune-500-ceos

Storr, Virgil Henry. 2013. *Understanding the Culture of Markets.* New York, NY: Routledge.

Taylor, Paul, Gretchen Livingston, D'Vera Cohn, Wendy Wang, Gabriel Velasco, and Rebecca Hinze-Pifer. 2010. "Childlessness Up Among All Women; Down Among Women with Advanced Degrees." Pew Research Center. Available from: https://www.pewresearch.org/wp-content/uploads/sites/3/2010/11/758-childless.pdf

Tiebout, Charles M. 1956. "A Pure Theory of Local Expenditures," *Journal of Political Economy* 64: 416-424.

The Trades Union Congress. 2022. "Women Much More Likely than Men to Have Flexible Work Arrangements That Lead to Loss of Hours and Pay." The Trades Union Congress, November 30, 2022. https://www.tuc.org.uk/news/tuc-women-much-more-likely-men-have-flexible-work-arrangements-lead-loss-hours-and-pay.

Beloit, WI 1830-1930: Beloit's Migrant and Immigrant Populations

Beatrice McKenzie[1]

1. Introduction

Beloit, Wisconsin is a small city in the industrial Midwest that is rich in natural resources—rivers, streams, fertile soil—and built resources that include transportation networks, proximity to markets, and a favorable business climate. A large and reliable labor pool is another resource required for robust industrialization. This paper focuses on the history of the peopling of the city of Beloit in the century between 1830 and 1930. The research questions include: Who came to Beloit and lived there? Where did they come from? What drew them? How did they fare? Did their families remain?

For the century between 1830 and 1930, which includes the period of removal of Native Americans from the area by the United States Government, Beloit's resources drew migrants from the East Coast and the South, as well as immigrants from northern and southern Europe. This paper examines three periods of population change in Beloit: native sovereignty and U.S. territorial ambitions (17th c-1840s); settlers and old immigrants (1836-1900); and new immigrants and African Americans (1900-1930). Without exception individuals and families who moved to Beloit sought a beneficial future defined by job opportunities and good schools. Yet migrants' ethnicity, gender, and race influenced their ability to remain and their access to opportunities for success.

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2. *Native Sovereignty and U.S. Territorial Ambitions*

The area where Beloit, Wisconsin sits now had been the site of the largest Ho-Chunk population center for centuries prior to its claim by white settlers.[2] U.S. Native American policy and U.S. land policy drew European Americans who came as speculators and as settlers. As the town became an industrial center, town leaders encouraged continued in-migration, drawing migrants from the regional, national, and international labor pool.

Early in the 19th century, 4500 Ho-Chunk people in forty geographically dispersed bands lived in the area west of the Great Lakes.[3] The largest of the Ho-Chunk villages, Keecak, or the Turtle, stood at the confluence of Turtle Creek and the Rock River, the village covering an area that is now in the city and immediate environs of Beloit, Wisconsin and South Beloit, Illinois. In 1829 the Turtle had a population of 700 in 35 distinct lodges, large dwellings that housed multiple families. Ho-Chunk (known as the Winnebago tribe at the time) lived at the Turtle through much of the year.[4] They cultivated corn in the flats south of Turtle Creek and east of the Rock River, before storing it underground for use throughout the year.[5] They tapped maple trees for sugar in late winter and then fished starting in the Spring. Sometimes in Spring but especially in Fall, Ho-Chunk moved to temporary camps to hunt buffalo until the 19th century, and deer and elk after. They moved south, north, and west to various hunting grounds in what was, after 1813, Michigan Territory, but would later become parts of the States of Illinois, Wisconsin, Minnesota, Iowa, and Missouri. Although it is not a perfect representation, because Ho-Chunk hunted beyond these boundaries, a map the tribe

2 Ho-Chunk were in the area that became the State of Wisconsin for "thousands of years." Patty Loew, *Indian Nations of Wisconsin: Histories of Endurance and Renewal*, 2nd edition (Wisconsin Historical Society Press, 2013), 44-49. The Ho Chunk origin story places their beginning near Green Bay where burial mounds date to the 11th century. Their language is Siouan, not Algonquian like other nearby tribes including Menominee, Sac and Fox, among others. See Stephen Kantrowitz, *Citizens of a Stolen Land: A Ho-Chunk History of the 19th c United States* (Chapel Hill, NC: University of North Carolina Press, 2023), 18. See also Bill Green, "The Search for Ke-Chunk: 2012 Investigations in South Beloit, Winnebago County, Illinois," 1-67. Paper delivered to Illinois Historic Preservation Agency, Springfield, IL, April 2013.

3 Kantrowitz, 15.

4 Two distinct first nations trace their origins to the Red Banks, near Green Bay, Wisconsin. One is the Winnebago Tribe of Nebraska and the other is the Ho-Chunk Tribe of Wisconsin. Because Winnebago was a misnomer derived from an Algonquian word referring to marshlands, not people, in 1994 the Winnebago Tribe of Wisconsin changed its name to the Ho-Chunk Nation. See "Ho-Chunk Nation" in ho-chunknation.com.

5 Lucius Fisher, Pioneer Recollections, *Wisconsin Magazine of History*, Vol. I, No. 3, March 1918, 49.

agreed to in 1825 shows that their traditional lands were bound by Green Bay, Lake Michigan, the Rock River, and the Mississippi River.[6]

The paucity of Native Americans in the historical record of Beloit, despite the significance of the size of the Ho-Chunk population and their unqualified sovereignty over the land up to 1837, is no minor error.[7] Historian Stephen Kantrowitz argues that Americans "have learned to tell our history as though Native peoples, if they were there at all, played minor or reactive roles."[8] Kantrowitz and other historians writing since 2010 examine the uses and misuses of law, military, and extrajudicial authority to dispossess Native Americans from their homelands and replace them with European American settlers.[9] The truth, in Beloit, is that the white settlers in the 1830s were squatters who relied on the United States Government to protect them and legalize their land claims after the fact.

After the U.S. and Britain signed treaties dividing land in North America between them in 1783 and 1814, a messy colonialism unfolded in the territories of the Great Lakes region. Though the U.S. Congress envisioned an orderly process of treaties with Native American tribes that secured land and required Natives to leave it, American settlers flooded over treaty boundaries, claimed land, and then demanded U.S. Army protection against Natives. Four treaties sought to dispossess Ho-Chunk of their land and move them west of the Mississippi River. (A number of Ho-Chunk remained in communities in central and northern Wisconsin, and eventually established their national government in Black River Falls, WI.) The first treaty, made in 1825 at Prairie du Chien on the Mississippi River, required different native groups to state which land they possessed on a map of the area. A Ho-Chunk leader protested at the time that because resources were used in common by different native peoples, making a map that assigned land to a single tribe truncated the Ho-Chunk peoples' actual lands.[10] A second treaty

6 Kantrowitz, 13-20.

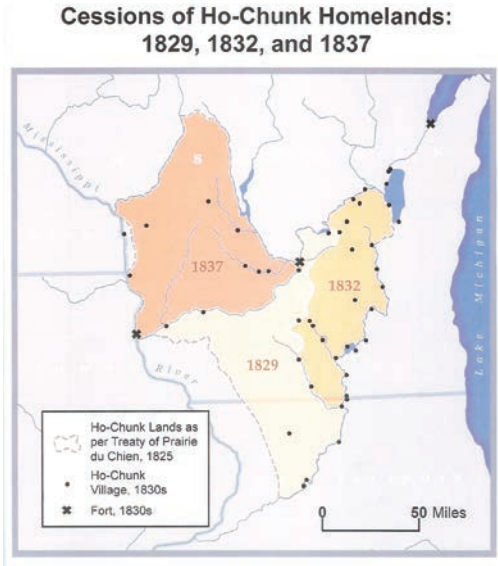
7 For primary sources with descriptions of large numbers of Native Americans see Fisher, 49-58 and Horace White, "The Founding of Beloit," 4, in Beloit College Archives.

8 Kantrowitz, 7. Kantrowitz also details Ho-Chunk (Winnebago) moves from the Neutral Grounds to lands in Minnesota, Iowa, and Nebraska.

9 See, for example, David G. Lewis, *Tribal Histories of the Willamette Valley* (Portland, OR: Ooligan Press, Portland State University, 2023); Jeffrey Ostler, *Surviving Genocide: Native Nations and the United States from the Revolution to Bleeding Kansas* (Yale University Press, 2020); Gray Whaley, *Oregon and the Collapse of the Illahee: U.S. Empire and the Transformation of an Indigenous World, 1792-1859* (UNC Press, 2010).

10 For a map that shows both the agreed-to area and the boundaries of Ho-Chunk ancestral lands, see Kantrowitz, 15.

in 1828 followed confrontations over lead resources near Galena, Illinois and on the Mississippi River., sometimes referred to as the "Winnebago War." The treaty required a temporary cession of Ho-Chunk land to the west of the Rock River. A third treaty, signed in 1832, followed the Blackhawk War between the United States and the Sauk, Fox, and Kickapoo tribes. Ho-Chunk sided with the Americans in that war. But because some Ho-Chunk helped Sauk and Fox evade American soldiers in Ho-Chunk territory, the treaty required cession of all Ho-Chunk land south and east of the Wisconsin River, including the land where the village of Turtle stood. Finally in 1837, U.S. authorities threatened and bullied a delegation of Ho-Chunk negotiators in Washington, D.C. until they agreed to treaty terms. Under these coercive conditions the Ho-Chunk agreed to relinquish all of their land east of the Mississippi River and to move the entire tribe to the Neutral Grounds west of the Mississippi.[11] The U.S. Government carried out deportations of at least half of the Ho-Chunk people in the early 1840s. Though white trappers and soldiers had traversed and stayed in the town that would become Beloit at various times in the 18th and 19th centuries, the first white settler claimed land there in 1836.



11 Kantrowitz, 32. See also Willard Barrows, "In the Neutral Grounds" from *Twelve Nights in the Hunters Camp*, 1869. Barrows offers an 1839 account of a hunting expedition in the Neutral Grounds, which he describes as a strip of land 150 miles long by 40 miles wide that was possessed by the "Winnebagoes" (Ho-Chunk), 107-108.

The first European American settler in what is now the Beloit area was a trapper and fur trader from Quebec named Joseph Thibault, who resided there for at least a few months in 1836.[12] Married to a Ho-Chunk woman, Thibault bought and sold furs in a large area that included land in Wisconsin and Illinois, and he built a log cabin near the Ho-Chunk village of Turtle. He had voted in the 1830 Illinois election, a right that depended on his race and his gender.[13] As the U.S. prepared to compel the Ho-Chunk to leave, Thibault claimed "three looks" of property at the confluence of Turtle Creek and the Rock River. The claim was not clearly legitimate since the U.S. had not yet permanently acquired the land. But Thibault's race and gender meant that other potential claimants recognized his claim.[14] This is the claim he sold to a newcomer in 1837.

3. Eastern Emigrants and Old Immigrants, 1830s-1900

U.S. Native American policy and U.S. land policy undergirded the founding of the city of Beloit. Veterans from the Blackhawk War and settlers who had already set up in Rockford and Belvidere, Illinois encouraged migrants from the East and North to the area. Before the U.S. Army "removed" the bulk of the

12 Sources vary with regard to the length of time Thibault, also spelled Tebo, lived at The Turtle. Some suggest for as long as 14 years. Historian Arthur Luebke, who wrote at length on such issues in *Pioneer Beloit*, (Beloit Historical Society, 1976) offers convincing evidence that Tebo only built his log cabin at the confluence of Turtle Creek and the Rock River *after* the Blackhawk War, and very likely in Autumn 1835, months before the first pioneer, Caleb Blodgett, arrived. Luebke read numerous diaries, letters, and newspaper accounts by pioneers and other voyagers passing through to answer this question. He suggests the reason a 14-year timespan is used is because Thibault worked for the American Fur Company for that entire period, and the Ho-Chunk at Keecak were in his territory. Luebke concludes Thibault regularly came through The Turtle but did not live there until 1835. Luebke, 24-37.

13 Joseph Thibeault (sic) voted in an 1830 Illinois election. See Luebke, 365, who cited Blanchard, *Discovery of the Northwest* (1880), 339. The Illinois State Constitution of 1818 allowed "white male inhabitants above the age of 21" to vote in the state. Illinois Constitution passed August 26, 1818.

14 The U.S. Congress passed a Preemption Act in 1830 (An Act to Grant Pre-emption Rights to Settlers on Public Lands, May 29, 1830, 21st Congress, 1st sess., ch. 208, Stats at Large of USA, 4:420-21) that was made permanent in 1841. Likely assumed to be for white men, the 1830 act did not specify the claimants' race or gender or tie the claim to U.S. citizenship, all of which was spelled out in the 1841 legislation. The 1830 act gave squatters already living on and improving land the right of first refusal when the government offered the land for sale to the general public. Scholars have explored the quid pro quo between congressmen from the slaveholding south and congressmen from the Old Northwest. Southern congressmen desired passage of the Indian Removal Act to remove natives from the Old Southwest to expand slavery and increase the power of the slaveholding states. They relied on votes of congressmen from the states and territories in the Northwest who, in turn, asked the southerners to support passage of the Preemption Act to legitimize squatters' claims. See Leonard A Carlson and Mark A Roberts, "Indian Lands, 'Squatterism,' and Slavery: Economic Interests and the Passage of the Indian Removal Act of 1830," *Explorations in Economic History* 43 (2006), 486-504.

Ho-Chunk population, and well before the U.S. set up a land office to survey and sell title to land, squatters could stake a claim, start to farm it, and sell parts of the claim to others. The first settlers of Beloit came from New England: from Vermont, New York, and New Hampshire. Some came from Canada. Many had previously sought claims in other areas west of New England as the nation expanded.

Lucius Fisher's story exemplifies the age and spirit of settlers from New England. Born in Vermont and son of farmers there, parents who could not afford to pay for their son's university education, Lucius took a job when he was 26 years old selling Fairbanks scales in the west.[15] Fisher took the job in order to explore opportunities for himself in the west, though he had the misfortune of setting out from Vermont during the economic panic of 1837. After taking a stagecoach to Troy, New York, and then a boat on the Erie Canal, Fisher found himself unable either to sell new scales or to collect monies owed to Fairbanks. On a whim in Buffalo, NY, he asked the captain of a schooner for passage to Chicago. They set out on still-icy lakes in early June and arrived in Chicago four weeks and two days later. From Chicago, Fisher took a steamer to Milwaukee, where the swollen lake flooded the town. He decided to head for Galena, Illinois, and began walking on the Indian trail from Milwaukee to the Rock River. In the town of Jefferson, fifty miles due west of Milwaukee, Fisher met Canadian immigrant Charles Goodhue and his two sons. They persuaded Fisher to visit the settlement, New Albany (later Beloit), and offered him a financial interest in the claims they had recently purchased there.[16] So Fisher joined up with the Goodhues and they purchased a canoe from Ho-Chunk people in a large encampment near Jefferson. Traveling forty miles south on the Rock River, the men stayed in Fort Atkinson and Janesville before arriving in New Albany. There they found a single settler family, the Blodgetts, who had bought Thibault's land claim just a few months earlier.[17] Lucius Fisher and his party arrived on a Sunday and the young man recorded his

15 Ironically, this was the same Fairbanks company that later became a leading industry in Beloit. Lucius Fisher is also mentioned in Burwell's chapter 8, "Can We Have a College Here?"

16 Squire Charles FH Goodhue of Sherbrooke, Lower Canada, former member of Canadian Parliament, had immigrated to the area with his two sons, George and William. Goodhue was a speculator with claims throughout the region, including in Rockford, Chicago, and Saint Louis. William, who was 14 when the family met Lucius Fisher, later became the first mayor of Beloit. Luebke, 55.

17 The 1936 Book of Beloit states that Caleb Blodgett paid $200, or perhaps up to $500, for Thibault's claim. He earned $2500 from the New England Emigrating Company for 1/3 of the claim, $2000 from George Goodhue for 1/4, and $1500 from Major Charles Johnston and John Doolittle for 1/6 of the claim. Thus he earned $6000 and still retained 1/4 of the claim for himself. *Book of Beloit*, 8.

first impressions of the place from the bluff where Beloit College now stands. "We had an uninterrupted view of the prairie…I said to my friend with me that it was the most beautiful landscape view that I had ever seen."[18] Fisher's intended stay of a couple of years was extended—he served multiple business and civic roles—and he lived in Beloit for decades.

Beyond U.S. Native American and land policy in the west, one of the reasons the town of Beloit grew so quickly in the mid-19th century is that a sizeable community of families from New England migrated together, bringing resources and people with them. The New England Emigrating Company, a group of 14 male investors from Colebrook, New Hampshire, sent Dr. Horace White and two others, Otis Bicknell and Robert Crane, to the area in February 1837. The men purchased one third of Blodgett's claim for $2500 and they encouraged their partners and other New Hampshire families to join them. The group's status as early comers combined with their race and gender allowed these "land colonists," as they called themselves, to prosper quickly. The 1936 Book of Beloit detailed the investment credits of each of the fourteen men and how they divided their pooled resources in February 1838.[19] Using one example, Cyrus Eames' investment credit with the New England Emigrating Company amounted to $630. In the division of property, he obtained a 280-acre farm and the buildings that were on it, and two lots of timber that he could cut down to use himself or to sell. He purchased the stake of an investor who didn't make the trip, and he acquired 26 lots in the newly-platted town of Beloit that he could use or sell to newcomers. Eames and the others profited greatly. We don't have much in the record about what happened to the Ho-Chunk people whose village had been located there, but there are some indications. Settlers hired them as guides on the Rock River. Settlers purchased their canoes and horses.[20] Settlers hired them to break prairie. Settlers even hired Ho-Chunk men to clear timber and build log cabins from a camp across the river where they were held under United States Army guard.[21] The timber clearing happened in 1837 while the removal treaty was being negotiated in Washington, DC. It would be two more years (Spring 1839) before the U.S. land office was

18 Lucius Fisher, 49.

19 Book of Beloit 1936, 11, spells out the amount of credits and division of spoils for each of the NEEC investors.

20 Fisher.

21 Horace White, "The Founding of Beloit," 4.

set up in Milwaukee to sell lots to settlers.[22] Thus years before the U.S. formally acquired the land by treaty with the Ho-Chunk nation, and well before the Native Americans were deported from the area, American settlers had claimed land, transferred claims, broken prairie, platted the town, and built homes.

Beloiters referred to the town right away as industrial and within a decade its history became an industrial history. The New Englanders and other settlers quickly set up factories, shops, community, and civic buildings—a sawmill in 1837, a store in 1838, the first churches, a post office, a bridge across the Rock River in 1839, a dam and a college in 1844. The fast-moving Rock River provided energy for industrial growth, and the west side rapidly grew to become a regional industrial center. Incorporated as a township in 1846, Beloit, Wisconsin became a city in 1856 with the son of one of the earliest white settlers, William Goodhue, as its first mayor.

The construction of railroads across the region from the 1850s to the 1880s facilitated the growth of Midwestern cities and their hinterlands; two major passenger and freight railway lines, the Chicago & Northwestern and the Racine & Southwestern connected Beloit and its industries to Midwestern and national markets.[23] The flour and saw mills were followed by factories to fabricate paper products and farm tools. Two of the largest industrial businesses that persisted in some form into the 20th century were the Merrill & Houston Iron Works and Eclipse Wind Engine & Company. Merrill & Houston made tools and then paper making machines. Eclipse made windmills. The town became known as "Iron City."

Beloit was and is an archetypal small city, a city that encompasses a few elite manufacturers and a predominantly American-born middle-class elite who promoted local boosterism and wielded social control that kept working class and transient residents in check.[24] Capital growth in Beloit was mainly local until industries first marketed products and then expanded production internationally at the end of the 19th century. Beyond the children of early settlers and migrants, this industrial growth relied on a steady stream of laborers from the vast number

22 Luebke, 120, citing Lucius Fisher, 281.

23 *Book of Beloit* 1936, 98-103. William Cronon, *Nature's Metropolis: Chicago and the Great West* (WW Norton & Co., 1991), 63-69.

24 Beatrice McKenzie, "Beloit WI 1896-1914: Global Integration of a Midwestern Industrial Town," in Miller Upton publication, *Annual Proceedings of the Wealth and Well-being of Nations*, Beloit College, November 2019. Original citation John Jakle, "America's Small Town/Big City Dialectic," *Journal of Cultural Geography* (1999), 1-27.

of European immigrants and their children.

Local industries that thrived were Beloit Iron Works (established in 1885 from remnants of Merrill & Houston), Fairbanks, Morse & Company (established in 1893 from remnants of Eclipse Wind Engine Company), Berlin Machine Works (moved to Beloit from New Berlin, WI in 1887), and Warner Instruments (established in 1902), among others.[25] In 1911, Beloit's factories operated at full capacity due to the recent growth.[26] But not everyone worked in industry. In a city directory published in 1907, people listed their occupations as blacksmiths, shopkeepers, carpenters, cigarmakers, growers of wheat, and tailors.[27]

Mixed in with the original settlers from New England were people who had immigrated from overseas or from Canada, but soon the growing industrial businesses attracted workers from the largest immigrant groups arriving to cities across the United States. Beloit's population expanded much more quickly than the populations of the State of Wisconsin or the entire United States.[28] Similar to other destinations in the Midwest, the largest immigrant groups to Beloit in the 1870s and 1880s were Germans, Irish, and Scandinavians (especially Norwegians).[29]

Among the various immigrant groups, Old Immigrants from Northern Europe enjoyed preferential treatment in Beloit. The German communities of Chicago and Milwaukee are well-known; census records indicate that many Germans also settled in Beloit. Irish immigrants came to Beloit from 1838, mainly as laborers in railway construction (and some would later become railroad officials) in the period between 1850 and 1890.[30] A vocal group in Beloit claims Norwegian ancestry, one of three nations (Norway, Denmark, Sweden) that comprise Scandinavia. Norwegians have been in the area the longest: a group of

25 *Ibid*.

26 "Beloit in 1911: Published by the *Beloit Daily News*," 9. Paid for by Beloit Commercial Club, Beloit College Archives.

27 People's occupations listed as carpenters, blacksmiths, tailors, cigarmakers, farmers, upholsterers, among others, in Beloit and South Beloit City Directory 1907-1908 (Milwaukee, WI: Wisconsin Directory Company, 1907-1908). See also *Handbook of Beloit* (Shumaker & McCabe, 1889), Beloit Historical Society.

28 The U.S. Census showed a 65 percent population increase for Beloit in 1900, versus a 21 percent increase for the United States and 21 percent increase for the population of the State of Wisconsin. *United States Census*.

29 *U.S. Census*. Germany was the leading source of United States immigrants from 1872-1896 but their numbers saw a steady decline after 1890. June Granatis Alexander, *Daily Life in Immigrant America*, Vol. 2, 1870-1920 (Chicago, IL: Ivan R. Dee, 2009), 13. Irish immigration, too, peaked in the 1880s, 14. In a wave that also crested in the 1880s, 1.2 million Scandinavians from Sweden, Norway, and Denmark, more than half of them Swedes, immigrated to the U.S. between 1870-1900, Alexander, 15.

30 *Book of Beloit*, 176.

Norwegians had arrived to farm a nearby rural area called Luther Valley in the 1840s; some in their large families relocated from their or their relatives' farms to Beloit and to other towns and cities in the region.[31] A preference for Scandinavian and German immigrants endured: in 1915, for example, an ad for a servant in a Beloit home read "Competent girl: German or Scandinavian preferred."[32] Between 1880 and 1905, leading families of Beloit, such as William Aldrich, windmill manufacturer, and his son, Alonzo Aldrich, who was the eventual owner of Beloit Iron Works, employed young Swedish, Danish, and Norwegian immigrant women in the home as servants.[33]

The children of German, Irish, and Scandinavian immigrants prospered in Beloit, thanks to the good living earned by their parents and to Beloit's fine public schools. The best educated in the second generation studied engineering, medicine, and law; some left for other U.S. cities but others remained to be city leaders and workers and managers in Beloit's factories. There are not a lot of histories of these middle-class Beloiters, but census evidence exists for many individuals, two of whom are noted here. John Voss, whose mother was a German immigrant, was born in Beloit in 1888. His father worked in Beloit as a blacksmith. Voss Jr. started working at Fairbanks at age 25 and 41 years later he retired as a foreman of blacksmith, drop forge and die sinking in the forge shop of the same company. James Hanlon, son of two Irish immigrants, started working at Fairbanks Morse in May, 1913. We can judge his parents' modest level of wealth by the presence of four boarders in the home in 1900. By January 1952 James was general foreman of machine repair and president of the Fairbanks-Morse recreational council.[34]

Thus, while some left the town, the children of privileged immigrant populations thrived in Beloit. They took jobs in the large industries, earned good livings, and stayed in town. This was not uniformly true of all migrant populations.

31 "Ethnicities of Beloit," *Book of Beloit*, 92.

32 *Beloit Daily News*, 1/2/15.

33 At the homes of William Aldrich, father, windmill manufacturer and Alonzo Aldrich, son, an owner of Beloit Iron Works, the census showed a different young Scandinavian woman (Swedish, Danish, and Norwegian in 1880, 1900, and 1905) living with the family as a servant. *U.S. Census*. In smaller cities, there were fewer opportunities for women. They were found in food processing, laundries, and light manufacturing—paper boxes, cigars, garments. But few worked in heavy industries. Alexander, 106.

34 *Beloit Handbook*, *U.S. Census*. *Hillfolks* newsletter, Fairbanks-Morse, 1954. *Beloit Historical Society*.

4. New immigrants and African American migrants, 1910s-1930s

The thriving industrial economy in Beloit around the turn of the 20th century continued to draw immigrants, migrants, and their children. As the Industrial Revolution transformed economies beyond Northern Europe, new groups of European immigrants arrived in even greater numbers.[35] Beginning in the 1880s and continuing until World War I, immigrants from Eastern and Southern Europe, particularly Italians, Greeks, and Lithuanians, settled in Beloit, making up a large part of the population increase of 65 percent from 1890 to 1900.[36] Like the earlier immigrants, they came to Beloit for the good industrial jobs, good schools, and the ability to purchase a home. At Fairbanks, Morse and Company in 1923, the number of workers born in Italy and Greece exceeded the number born in Norway, Ireland, or Germany.[37] The town provided "integration services" to these migrants, from basic literacy classes to classes for clerks and office personnel, classes in sewing and dressmaking, and classes in automobile work, including repairing, disassembling and assembling engines and motor cars.[38] One adult night school class in 1915 had six Italians, three Austrians, two Greeks, a Russian and a Lithuanian student.[39]

Italian and Greek newcomers faced discrimination in Beloit. Many articles in the Beloit press decried degenerate Greeks who "howled and cursed in the streets" and Italians who "have accomplished practically nothing for their own betterment in the last several years."[40] Italians had been found responsible for stealing coal from the St. Paul freight yard. Italian immigrants made up one third of the families who applied for aid during a two-week period in February, 1915.[41]

35 450,000 Greeks arrived in the U.S. between 1900 and 1914. 4.2 million Italians immigrated to the U.S. from 1870-1920; each year between 1900 and 1914, more than 130,000 Italians arrived. Alexander, p. 22.

36 *U.S. Census* 1880-1900.

37 "Americanization" memorandum detailing FM's diverse immigrant workforce in July 1923 shows 185 Italians, 77 Greeks, 64 Germans, 126 Danish/Swedes/Norwegians, and 64 English/Scotch/Irish. Weaver History, "Fairbanks-Morse" folder, Beloit College Archives.

38 Beloit Daily News (BDN) 8/7/15.

39 Vocational schools did not accept Black workers, telling potential students there was no reason to learn the skills because Fairbanks would not allow them to use the skills. Tom Polaski, "The Impact of the Black Migration to Fairbanks, Morse and Co. (1915-1920)", Master of Arts Thesis, Northern Illinois University, 1984, 22.

40 BDN 1915. See in particular 1/12/15 and 4/30/15.

41 BDN 2/3/15.

Newspaper accounts also suggested Italians were used as strikebreakers.[42] The reputation of the young Italian and Greek men changed, however, when they returned to Europe to fight for their nations.[43] Accounts through the war followed particular young men who returned to the front in Greece and Italy—some local workers were killed—and they were spoken about more favorably after the war.

There is very little research conducted of the outcomes for the children of Italian and Greek immigrants in Beloit, but a limited number of oral histories indicate professional opportunities for the children of other immigrant groups, including the son of a Croatian immigrant. Frank Vuchetich was born in Croatia, immigrated as a young boy with his parents in 1912, moved to Park Falls, Wisconsin in 1920, attended school and university, and was drawn to Beloit by a teaching offer.[44] The children of Mexican and Chinese immigrants who were educated in Beloit's public schools also fared well. Jim Terrones was born in Delevan, Wisconsin to immigrant parents from Mexico. He attended Beloit public schools, lived in Beloit, and worked for decades in nearby Rockton, Illinois, at Ecolab.[45] Moreover, Chinese immigrants Charles and Yee Shee Wong raised seven children in Beloit Wisconsin starting in 1924. Three of their sons worked in Beloit industries while they were in high school and college. After their college graduations, the oldest sons, Gim and George, worked for decades as professionals and in management at Yates American, Warner Electric, Beloit Corp. and Fairbanks-Morse in Beloit and for their subsidiaries in other midwestern cities. The children of Mexican and Chinese immigrants faced overt discrimination, but it did not prevent them from professional success in Beloit. This was different for the children of Black migrants.

African Americans were critical to Beloit's industrial development during World War I. A cutoff in international migration due to the war hampered production at Northern factories like Fairbanks Morse & Co. Fairbanks had large orders for their diesel engines, but they needed workers to meet production goals. Black workers made up the largest group and accounted for thirty percent of the total number of immigrants and migrants working at Fairbanks within six years of initial recruitment.[46] Black residents of Mississippi and other states were pushed

42 BDN 4/30/15.
43 BDN September-October 1915.
44 Oral history of Dan Schooff, conducted by author in 2017.
45 Oral history of James Terrones, conducted by author on March 13, 2018.
46 "Americanization" memorandum shows 229 Black workers, 185 Italians, 77 Greeks, 64 Germans,

north by limited job opportunities and inadequate schools in the South, while newspapers like the Chicago Defender promised access to good jobs, schools, and civil rights in the North. In 1917, Fairbanks sent a Black worker, John McCord, to Mississippi to recruit laborers, promising a wage of 22.5 cents per hour. Another Fairbanks plan recruited students from Tuskegee Institute as summer interns in the 1910s.[47] The population of Black Beloiters, who had appeared in the Beloit census since 1850, grew through the 19th century and burgeoned in the 20th. There were fewer than 100 African Americans in the city and township in 1910. That number grew to 834 in 1920, a figure that stayed around the same size until the industrial boom during World War II and the Cold War. By 1970, the African American population of Beloit and Beloit township was over 3000, about ten percent of the total population. Although African Americans faced systemic racism in the North--in Beloit, too--opportunities in education and especially through the organization of and participation in Black social institutions like the church helped some individuals and families thrive in Beloit.[48]

Courtesy of Fairbanks Morse Defense and the Beloit Public Library

Systemic racism existed in Beloit. Fairbanks segregated its employees, building the Edgewater Flats, four concrete block apartments with 24 two-story units across the river for Black employees, and 138 houses near the factory for white employees.[49] It also built the segregated YMCA on Sixth

126 Danish/Swedes/Norwegians, and 64 English/Scotch/Irish. Weaver History, "Fairbanks-Morse" folder, Beloit College Archives.

47 Students appreciated earning money and gaining practical experience in the summer work. Ernest Jones, a Liberian, came to Beloit from Tuskegee in 1920 to learn manufacturing. He worked as a molder in the brass foundry. Polaski describes deleterious effects of working in the brass foundry, including a debilitating illness called "brass chills" from longterm exposure to the fumes, 20.

48 The African Methodist Episcopal Church was organized in 1883. *Handbook of Beloit* (Shumake & McCabe, 1889), Beloit Historical Society.

49 Polaski, 11.

Street initially to house the Tuskegee student interns, and so Beloit had segregated YMCAs and scout troops for decades.[50] By 1920, many restaurants and lunch counters in Beloit refused to serve Black patrons.[51]

Segregation also occurred in the workplace. Factories relegated Black workers to particular jobs in the foundries and power plants, and for decades it was impossible to move to other areas of the factories to less dangerous jobs that had better pay.[52] Moreover, managers in the largest factories colluded to deny jobs to Black workers who complained or demanded change. Professional jobs such as teacher were denied to migrants who came north with credentials and experience.

Unlike the children of white immigrants, job opportunities eluded the children of Black Beloiters in the next generation. In 1961, the President of Beloit's chapter of the National Association for the Advancement of Colored People (NAACP) remarked that there was not a single Black engineer, draftsman, or foreman at Fairbanks-Morse. This is in spite of access to the same schools and in stark contrast to the opportunities outlined above for the children of other immigrant groups.[53] Between limited advancement in the workplace, lack of opportunity for their children, and systemic racism in the town, many Black residents did not stay. They sought work elsewhere, whether Madison, Milwaukee, or sites in Illinois and Iowa.[54]

Some Black workers, like the Johnson brothers, found the means to advance. In 1917, Joseph Johnson and his two brothers, Jim and Wade, migrated to Beloit with their wives and children. Having worked as sharecroppers in Pheba, Mississippi, the three families came north by train "looking for a better future."[55] The brothers were hired to work in the foundry at Fairbanks Morse and Company and they joined other recent arrivals living in a temporary camp set up next to the

50 Polaski, 9.

51 Polaski, 18.

52 Foundry work at Fairbanks-Morse, 20 cents per hour in 1919, was "hard, dirty, and noisy" with injuries a common occurrence. There were two types of work in the foundry: the shakeout laborer took hot castings out of the sand molds and removed hot sand from the castings, which required a strong back. The chipper and grinder smoothed out rough edges around and inside an engine using an electric hammer and chisel. This work was noisy and dangerous, often injuring workers' eyes and hearing. Injury and death occurred most frequently where the castings were poured. Polaski, 19.

53 See Beatrice McKenzie, *The Wongs of Beloit, Wisconsin* (University of Wisconsin Press, 2023).

54 Polaski, 18 and Census information. Black workers were relegated to foundry work and only Beloit Iron Works and Fairbanks Morse had foundries. Interviewees stated that the two operations colluded in the hiring of Black workers.

55 Oral history of Beverly Bond by Beloit College student Fiona Cismesia, March 22, 2019, New Zion Baptist Church, Beloit, WI. Transcript in Beloit College Archives.

factory. After two or three years working at Fairbanks and pooling their money, the Johnson brothers purchased homes on the 1100 block of Pleasant Street and they opened Johnson's Grocery Store a few blocks away, on the corner of Pleasant and Portland Streets. Similar to the experience of the migrants of the New England Emigrating Company, that they migrated as a small community allowed the Johnson family to rapidly improve their circumstances. They were also able to bypass job and housing discrimination.

Attending well-funded and unsegregated public schools in Beloit benefitted the children and grandchildren of African American migrants. Joseph Johnson's son Phillip, who was only four when the family moved to Beloit, attended Wright Elementary, Roosevelt Junior High School, and Beloit Memorial High School, from which he graduated in 1934. Phillip worked at Fairbanks, too. He met his wife, Christabel, at a school dance in high school. In the 1930s Phillip was active in the NAACP. Later he was elected to the Rock County Board of Supervisors, and he volunteered in other civic organizations. The family were leaders at New Zion Baptist Church, where Christabel led Bible Study and sang and Phillip was a deacon. Although they were educated in Beloit's schools, the high-achieving African American children recognized that because of a racist atmosphere in the largest industries, their futures lay elsewhere.[56] Phillip's children attended university, becoming a television producer, an attorney, and a financial manager. The oldest, Philip Leslie, attended Princeton University on an ROTC scholarship and served as a helicopter pilot for three tours in the Vietnam War. After the war he became an attorney and moved to Los Angeles.[57] Christabel and Phillip's youngest child, Beverly, having raised three successful kids and worked in government, returned to Beloit in retirement and now works at New Zion Baptist Church.

It is difficult to tell a single story that encompasses the ugly with the impressive history of the peopling of the city of Beloit. From 1836, the first European American settlers had real privileges, squatting on Ho-Chunk land while the U.S. government managed the legalities of treaties and land law. The

56 Polaski, 17. Evidence of movement of Black population earlier. Eleven Black families in 1880 census, total 57 persons. By 1891, only four of the 11 families were still there. *Handbook of Beloit* (Shumaker & McCabe, 1891), Beloit Historical Society.

57 Beloit College student Fiona Cismesia interviewed Beverly Bond Johnson in 2019 as part of a Digital History Harvest co-sponsored by the college and Beloit Historical Society. See transcript in Beloit College Archives. Phillip Johnson (his brothers were James and Wade) worked at Fairbanks for several years before working as a welder and millwright at Gunite in Rockford, IL for 30 years. Christabel Johnson also graduated from Beloit Memorial High School, in 1936.

Ho-Chunk—who never disappeared from the state—lost in those interactions. They lost their largest town at the confluence of Turtle Creek and the Rock River. In the early 1840s, the U.S. government deported a great number of Ho-Chunk from the area, making way for Americans and others. Over time, economic and social opportunity drew migrants to Beloit. From New Englanders seeking land and prosperity in the west to various immigrant groups from Northern, Southern, and Eastern Europe and beyond, to African American migrants from the South, migrants came to Beloit looking for well-paid jobs, good schools, and the ability to live a good life in community. Their children benefited from the education and community involvement, but if opportunities seemed limited, migrants and their children left, often for other Midwestern cities and towns.

References

Alexander, June Granatis, *Daily Life in Immigrant America*, Vol. 2, 1870-1920 (Chicago, IL: Ivan R. Dee, 2009).

Carlson A. Leonard and Mark A Roberts, "Indian Lands, 'Squatterism,' and Slavery: Economic Interests and the Passage of the Indian Removal Act of 1830," *Explorations in Economic History* 43 (2006), 486-504.

Cronon, William, *Nature's Metropolis: Chicago and the Great West* (WW Norton & Co., 1991).

Fisher, Lucius, Pioneer Recollections, *Wisconsin Magazine of History*, Vol. I, No. 3, March 1918.

Kantrowitz, Stephen, *Citizens of a Stolen Land: A Ho-Chunk History of the 19th c United States* (Chapel Hill, NC: University of North Carolina Press, 2023).

Lewis, David G., *Tribal Histories of the Willamette Valley* (Portland, OR: Ooligan Press, Portland State University, 2023).

Loew, Patty, *Indian Nations of Wisconsin: Histories of Endurance and Renewal*, 2nd edition (Wisconsin Historical Society Press, 2013).

McKenzie, Beatrice, *The Wongs of Beloit, Wisconsin* (University of Wisconsin Press, 2023).

Ostler, Jeffrey, *Surviving Genocide: Native Nations and the United States from the Revolution to Bleeding Kansas* (Yale University Press, 2020).

Whaley, Gray, *Oregon and the Collapse of the Illahee: U.S. Empire and the Transformation of an Indigenous World, 1792-1859* (UNC Press, 2010).

Celebrating Beloit's Industrial Past and Forging a Path Forward

Rob Gerbitz[1]

Introduction

Our company's mission statement is to "make an impact on communities by stimulating growth, creating jobs, and honoring history." When Diane Hendricks hired me approximately fifteen years ago, she was clear that my number one responsibility was to build the City of Beloit. At the time, I thought I knew what she meant. I thought she was talking about buildings. But what I've grown to understand is that what she really meant was *stimulating growth* through buildings and *creating jobs* (in part) through buildings. And that has been what has driven me for the last fifteen years.

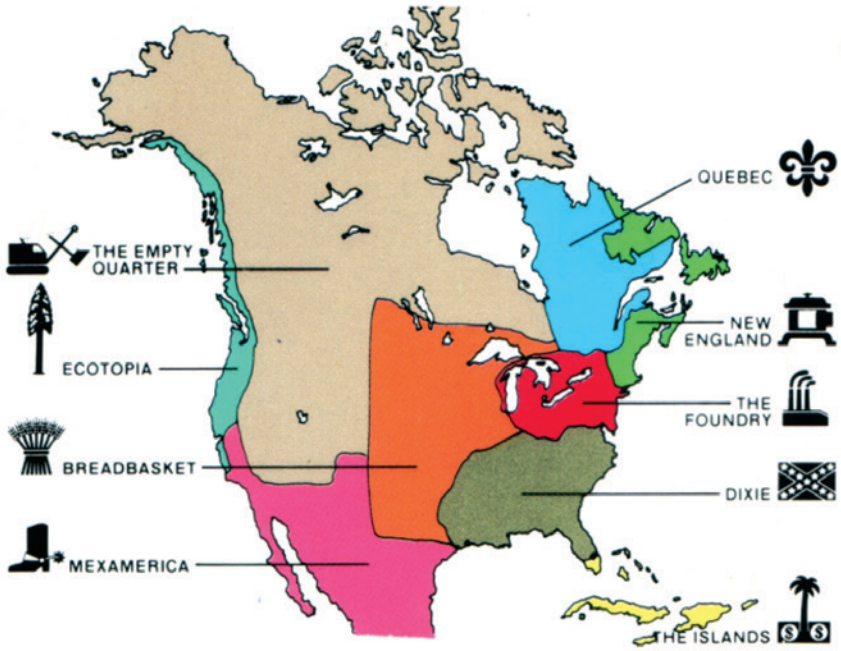
Hendricks Commercial Properties (HCP) has taken on many projects in and around the City of Beloit during that time, including (but not limited to) restaurants on Grand Avenue such as Lucy's #7 Burger Bar and Truk't, a new baseball stadium at the confluence of Turtle Creek and the Rock River, an industrial park near Interstate 90, two large apartment buildings on the west side of downtown, and most importantly, the Ironworks campus.

Fifteen years ago, I also did not know much about the City of Beloit. My job has been to learn about the history of the City and to find ways to honor it and champion it the best we possibly can. I am not a historian. I had to figure out how to study history along the way, and how to access the materials that I needed (I have spent countless hours going through the archives at the Beloit Historical Society). To understand the economic history of this great city, you have to pay attention to its geographic location. Beloit sits between two major economic regions of the 19th and 20th centuries- the industrial region (also called

1 Rob Gerbitz is the President & CEO of Hendricks Commercial Properties.

"the foundry), which continues north and east through Pennsylvania, and the agricultural region (or "the breadbasket"), which continues west to the Dakotas and as south as Oklahoma.

Figure 1. Map of economic regions of the United States, 19th and 20th Century



Many different industries and companies have operated in the City of Beloit; the Beloit Iron Works is one that represents the industrial past very well. For myself, it became clear that the place to start my study of history was my own office, which is located in what was Beloit Iron Works (and now, is the Beloit Ironworks Campus). It is the epicenter of this downtown – just a block from the main street. Therefore, I start this chapter, section 2, with the story of Beloit Iron Works.

You do not need to travel far from City boundaries to find yourself in corn and soy fields. And, as someone who pays attention to buildings, it is hard to miss the Hormel Chili or Frito Lay factories, especially as you are traveling along Interstate 90. Of course, we're not just in agricultural territory, we are in Wisconsin – the

Dairyland. I will share just a bit of that agricultural history by talking about the Wright and Wagner Dairy (section 3). To conclude, I will bring our economic history up to present day and share a bit about what Hendricks Commercial Properties is working on today.

1. Beloit Industrial History and Beloit Iron Works (1858 – 1999)

In the 1840s and 1850s, a tide of New England settlers migrated west, and several made their home in the Rock River Valley and the City of Beloit. Hodge and Ely describe how industries were attracted to the best sources of water power: "Newspapers ran advertisements boasting of new dams that could supply cheap power through the use of industrial water wheels" (1980: chap 1, pg 2).[2] By 1844, a dam and sawmill were located in Beloit along the Rock River. By 1850, two foundries and five mills "crowded Beloit's industrial canal" (ibid.).

A foundry is a factory that makes metal objects through a process of casting, or melting metal, pouring liquid metal into a mold, and then allowing it to cool and solidify. The work was difficult, requiring physical strength to handle the machinery, and the fortitude to withstand the hot temperatures and risks of injury. The early foundries along the Rock River cast parts for many different industries nearby.[3]

One of these foundries would become Beloit Iron Works. Built by George Barker and Israel Love in 1847, the foundry first manufactured reapers, used to harvest grain (ibid.). Ten years later, in 1857, another partner joined, John B. Merrill, who came to Beloit from New Hampshire. Soon after, his brother, Orson E. Merrill, joined the business.

In December 1858 the two brothers started a separate business within the factory known as the J.B. and O.E. Merrill Machine Shop. The machine shop made rotary plows, mill gearings, Anderson Water Wheels, and sugar cane mills. Unfortunately, a nation-wide depression hit by 1859, causing the company to reduce their labor force from sixty to six (ibid: chap 1, pg 3).

2 This source is an unpublished manuscript in the Beloit College archives. The title is "The Earliest Forerunners of the Beloit Corporation." The completion date is unknown but estimated to be 1980. The second author, Larry Ely, is a graduate of Beloit College class of 1978. The page numbers restart each chapter, therefore, the notation is chapter number as well as page number.

3 "Hard Metal Heartbeat" *Beloit Daily News*, Book of Beloit II, March 1986. Pg. 306.

It's unclear how the City of Beloit population may have been affected by the depression 1858-59. The first census numbers are from 1860 and show increases in population for each subsequent decade to 1940.

Table 1. Population of Beloit City, 1860 to 1940

Year	Population	Population increase	Population increase as percentage
1860	4,098		
1870	4,396	298	7.3
1880	4,790	394	9.0
1890	6,315	1,525	31.8
1900	10,436	4,121	65.3
1910	15,125	4,689	44.9
1920	21,284	6,159	40.7
1930	23,611	2,327	10.9
1940	25,365	1,754	7.4

Source: Census of Wisconsin, Table 2, "Population of incorporated places of 10,000 or more from earliest census to 1940" page 1162.[4]

After leaving Beloit for a brief time, Orson returned in late 1860 and soon became involved in the papermaking industry with another brother, Sereno Merrill. In 1862, Sereno and Orson built a new machine to make paper using steam drying. As Hodge and Ely note, Orson entered the paper machine business at the right moment:

> The coming of the railroad had marked the beginning of a revolution in the growth of the midwestern paper trade because it enabled paper makers to reach distant markets. General paper consumption was growing, and, after the Civil War began in 1861, the needs of centralized government pushed paper demand even higher… In spite of a sag in the paper market during the early 1870s, the midwestern paper trade was booming. From 1860 to 1890, paper production in Wisconsin and Michigan alone increased from 1.52 % to 8.5 % of total paper production in the United States (ibid.: chap 1, pgs 7-8).

4 Available online at https://www2.census.gov/library/publications/decennial/1940/population-volume-1/33973538v1ch10.pdf

In addition to papermaking machines, Orson soon expanded into water wheels. Local miller and inventor, George Houston, created an improved water wheel and asked Orson to manufacture it. The water wheel was patented in 1870, and Houston joined O. E. Merrill and Company to lead the water wheel division (ibid.: chap 1, pg 9). By 1873, the company was renamed the Merrill and Houston Corporation. The Houston Water Wheel was exhibited at the 1876 Centennial Exposition in Philadelphia, Pennsylvania, the only invention from Beloit, Wisconsin featured.

Over the next decade, a series of hardships hit the company again, including an economic recession and depression, a fire at the company buildings, and the death of part owner and manager, C. F. G. Collins in 1883 (ibid.: chap 2, pg 34). In 1885 the assets of Merrill & Houston Iron Works were sold for approximately $31,000, or approximately $1 million dollars today (year 2024).

In July 1885 four former employees of the Merrill and Houston Iron Works– Fred Messer (former superintendent), Alonzo Aldrich, William Grinnell, and Noble Ross – formed a new corporation, the Beloit Iron Works.[5] In 1896, Beloit Iron Works unveiled a new state of the art machine shop in downtown and built a new foundry. One year later the company had its first international order, a papermaking machine was shipped to Japan.

Under the leadership of Alonzo Aldrich and Elbert H. Neese, Sr., Beloit Iron Works experienced strong growth in the first several decades of the 20th century. The Great Depression hit the company hard with orders limited to parts and repairs, rather than new machines. By 1941, however, the Beloit Iron Works had a new area of production supporting war efforts. The company made machine tools needed for war production and Corvette engines for the U.S. Maritime Commission.[6]

By 1949, the company had grown to employ more than 1,500 people (ten times the number fifty years earlier), and opened the first international office in Paris, France. In 1962, Beloit Iron Works rebranded itself as the Beloit Corporation to be consistent with the company's activities and plans for further diversification. Sales continued to be strong. The Beloit Corporation purchased Lenox Machine Company, the Rader Companies, the Roll Covering Division of

5 "From Beloit Iron Works to Beloit Corporation." The Beloit Historical Society. Available online at https://www.beloithistoricalsociety.com/ironworks.php.
6 Ibid.

Raybestos Manhattan, and diversified its activities into insurances, railroads, and agribusiness.[7] At its peak, the Beloit Corporation employed approximately 7,700 people.

Courtesy Beloit College Archives.

Then in 1985, Chairman Elbert H. Neese, Jr. announced that the Neese Family had decided to sell Beloit Corporation. The Harnischfeger Corporation of Milwaukee, Wisconsin purchased Beloit Corporation for $175 million. In 1999 Harnischfeger Corporation filed a Chapter 11 petition for Bankruptcy and the Beloit Corporation closed its doors.

Half-full cups of coffee were left on desks. Fifteen hundred employees lost their jobs.

The former Beloit Corporation campus gained a lifeline in 2001 when Diane and Ken Hendricks purchased the property. The couple already owned HCP and ABC Supply in Beloit, Wisconsin. When I started with HCP in 2009, we had approximately 160 employees across about six different companies. Diane and Ken wanted to bring employees back, increasing employment opportunities in Beloit.

7 Ibid.

That was their goal. That was their drive. It's an extraordinarily difficult task.

If you look at the Ironworks campus today, we've collaborated with many different companies to bring activity back to this space. We have 1,600 employees that are working in this building, 44 different companies, and we're about 50% there. We still have work to do, but it has become something dynamic and growing.

The YMCA is an important part of the Ironworks campus. The vision of the YMCA is to "create communities that we all want to live in."[8] The Stateline YMCA was first chartered in 1882, so it is an organization with a long history in the community as well. The YMCA opened its doors on the Ironworks campus in 2017. They bring in people of all ages and socioeconomic status, with services such as daycare, group exercise activities for adults, and summer camp for school-age children. The Beloit and Roscoe locations together have over 11,000 memberships and more than 225,000 visits each year.[9] For this community, in the City of Beloit downtown, that is a dramatic change.

Adjacent to the YMCA is Irontek, a coworking space for startups and small businesses. Irontek opened in 2016 as a 8,000 square foot facility. One of the first companies to use the office space was Comply365, an airline software company, led by Kerry Frank.[10] Other large technology companies moved to the tech hub such as Acculynx, a cloud-based software that supports the roofing industry, and FatWallet, a comparison shopping website, later acquired by Rakuten, a Japanese ecommerce company.[11] In addition, gener8tor, a nationally ranked venture capital firm and accelerator, operates an office in Irontek and provides workshops and accelerator programs for local start-ups. Irontek is an incredibly dynamic place, and it has seen tremendous growth. Less than a decade later in 2024, Irontek provides space for over 100 companies and has expanded to 27,000 square feet. I am very proud of the team at Irontek and the companies that are in the building, contributing to our local economy.

8 Available online, https://www.statelineymca.org/Portals/0/YMCA%20Media%20Kit.pdf

9 The estimate of 225,000 is swipes at the door, which does not include children in daycare or summer camp, or children engaged in other activities at other facilities, such as the baseball and soccer fields on Prairie Ave, Beloit, WI.

10 "Beloit's Comply365 flying high and expanding into other industries" *Wisconsin Business*. April 1, 2016. Available online, https://www.wisbusiness.com/2016/beloits-comply365-flying-high-and-expanding-into-other-industries/.

11 Cordio, Matt. "Beloit: An Emerging Tech Hub in Southern Wisconsin." *Milwaukee Journal Sentinel*. July 6, 2016. Available online, https://archive.jsonline.com/blogs/business/beloit-an-emerging-tech-hub-in-southern-wisconsin-768539019324-385781141.html

Although the Beloit Corporation closed its doors twenty-five years ago, there are still former employees who live in the City and a Beloit Corps alumni group that meets periodically. Several years ago, I was asked to give a speech to the Beloit Corp alumni. I shared an update on the Ironworks campus, including Irontek. Afterwards, a woman came up to me, and she was crying. She hugged me and explained, "I worked on that floor for 35 years of my life… I am so happy to see this filled with people again." It meant so much to me. That's what gives me and my entire team the drive to keep going.

On the east side of the Rock River, HCP has another project which pays homage to Beloit Iron Works. HCP purchased the Beloit Inn in 2001 and transformed and renamed it the Ironworks Hotel in 2013. The steak house on the first floor is called Merrill and Houston's Steak Joint, after the early owners of Merrill and Houston's Iron Works. Both the Ironworks Hotel and Merrill and Houston's celebrate the industrial history of Beloit, with exposed steel framing, collections of ring gears (or "cogs") displayed, and historical photographs of the City and residents in the 19th century.

2. Agricultural History of Beloit

Another important aspect of Beloit's economic history and current economy is agriculture and food production. As McKenzie describes in chapter 6, early immigrants in the 19th century were drawn west by the natural resources of rivers, streams, and fertile soil. Many early residents of Beloit were from New England (especially Vermont, New Hampshire, and New York), and especially in the subsequent decades (1870s), many were from Germany, Ireland, and Scandinavia (McKenzie XX). Wheat was the first cash crop for settlers in Wisconsin because it was easy to grow and could be harvested twice a year. In fact, from 1840-1880, Wisconsin was known as "America's breadbasket" because it grew one-sixth of the country's total wheat production.[12]

Over time, farmers shifted more and more towards feed crops, which were well-suited for state's climate. At the same time, dairy farming was becoming more popular and by 1899, over 90 percent of farms in Wisconsin raised dairy cows.[13]

12 "The Rise of Dairy Farming How Wisconsin Became the Dairy State." Wisconsin Historical Society. Available online at https://www.wisconsinhistory.org/Records/Article/CS411
13 Ibid.

Charles Wright and Orville Sturtevant started Sturtevant & Wright Creamery in Beloit in 1906. The creamery was located downtown on Mill Street and was Beloit's first bottled milk plant. The creamery had one wagon which delivered fresh milk to city residents. On the first day in 1907, they sold 12 quarts of milk. A few years later in 1909, the business had expanded to 1,700 customers.[14]

That same year Ira Wagner joined the company, and it was renamed Sturtevant, Wright and Wagner Dairy. The dairy was the first to pasteurize bottled milk with a machine.

In 1921, Sturtevant resigned due to health, and the firm was incorporated under the name Wright & Wagner Dairy. A decade later in 1930, the company merged with Beatrice Foods and becomes one of the leading food companies in the country. They manufactured evaporated milk, powdered milk, ice cream, cottage cheese, butter, and caramel based candy or caramel candy base.

The next major change in the company's history came in 1988, when Kerry Group acquired the company and used the dairy as their North America headquarters. Kerry Group is based in Ireland and started in 1972 as a dairy cooperative. As their business grew, Kerry needed to expand, and they built a campus near Interstate 90 and Interstate 43 in 2009. The facility serves as their Regional Technology and Innovation Centre in North America. Today, Kerry Group makes dozens of different types of products, from flavor ingredients to pharmaceutical applications to pet food nutrition. Alongside ABC Supply and HCP, Kerry Group is one of the major employers in Beloit.

After Kerry moved from the downtown, the buildings and space needed a new use. HCP purchased the building. The City of Beloit, like many other places, needs more housing, and like many other cities, there is a desire to build housing in the downtown in order to further animate the area. Unfortunately, the building could not be reused; the existing structure would have been too costly to renovate and expand. Therefore in 2016, HCP broke ground on a new apartment building on the site, naming it the Wright and Wagner Lofts in honor of the former company and history of dairy and food production in Beloit. As of 2024, Wright and Wagner is two apartment buildings, the Grand Building and the Riverfront Building, with 54 and 83 units, respectively.

14 The 1910 Census for the City of Beloit was approximately 15,000 people.

3. Beloit Today (2024 – future)

The economy of Beloit looks different from what it did when industry was first forming along the Rock River in the 1840s. Through the mid-20th century, industry, led by Beloit Iron Works (and Fairbanks Morse, described by McKenzie in chapter 6), was king. By the 1980s, new technology and the forces of globalization led to a decline in the industrial sector throughout the United States. Places like Beloit became known as part of the "Rust Belt." Today, the businesses of Beloit, including HCP, ABC Supply, Kerry Ingredients, Fairbanks Morse Defense, and others, are finding ways to honor the past and chart a course forward.

In 2024, manufacturing remains a large part of the economy as well as health care, retail, hospitality, education, and technology. Looking at the 10-Mile City, an area formed by creating a 10-mile radius from the City center, the largest sectors by employment are manufacturing with 17.6 percent of the labor force, 15.8 percent in health care, and 11.4 percent in retail.[15] The population has stayed relatively steady over the last several decades at around 36,000 people, and the 10-Mile City population is approximately 112,000.

Part of the strategy to grow the local economy is to create a vibrant downtown where people want to live and work. HCP has supported a number of entertainment and recreational facilities downtown, including the YMCA, the new ABC Supply Stadium for the Sky Carp minor league team, and coming soon, Henry Dorrbaker's, a venue with duckpin bowling, arcade games, bar, pub food, and more. The entertainment space is named after a resident of Beloit (Henry Dorrbaker, 1855- 1924), who owned several bowling alleys and saloons in the City. He was also a talented bowler, winning tournaments throughout the Midwest.

Finally, HCP is working to renovate Hanchett Hall, located near the corner of Broad and State in downtown Beloit. The building was constructed in 1856 and operated as a concert hall. Importantly, Abraham Lincoln spoke in Hanchett Hall in 1859, expressing his hatred of slavery and opposition to its extension.[16] Many residents of Beloit gathered to hear Lincoln's one-and-a-half-hour speech.

15 "Beloit 10-Mile City Report, 2023-24," Belmark Associates, created for the Greater Beloit Economic Development Corporation. pg 11.

16 https://www.wisconsinhistory.org/Records/Property/HI16401

A member of the Republican Party, Lincoln was elected President of the United States a year later and served from 1861-65. HCP plans to incorporate a museum and conference space into the renovated Hanchett Hall.

References

"Beloit 10 Mile City Report, 2023-24." Belmark Associates, created for the Greater Beloit Economic Development Corporation.

"From Beloit Iron Works to Beloit Corporation." The Beloit Historical Society. Available online at https://www.beloithistoricalsociety.com/ironworks.php.

Hodge, Robert, and Larry Ely. 1980 (estimated). *The Earliest Forerunners of the Beloit Corporation.* Not published. Available in Beloit College Archives.

"The Rise of Dairy Farming How Wisconsin Became the Dairy State." Wisconsin Historical Society. Available online at https://www.wisconsinhistory.org/Records/Article/CS411

Can We Have a College Here?

Fred Burwell[1]

1. Horace White and the New England Emigrating Company: In search of a new home

Let's travel back to a day in late October, 1836. As the leaves turned golden, orange, and fiery red, the young men of Colebrook, New Hampshire, gazed westward and pondered their futures. The most enterprising gathered together and established the New England Emigrating Company, with plans to move once they settled on the best location.

Several factors contributed to their desire to move west. Colebrook's winters, said one writer, lasted seven months.[2] Played-out soils and short summers led to poor crops and even crop failure. A national depression in 1836 didn't help matters. Books and pamphlets touted the fertile lands opening up out west.

Enter 27-year-old physician Horace White, a Dartmouth College graduate, selected by the Company as their agent, with a salary of $100 per month and expenses. That winter of 1836-37, he set out on an arduous journey, often traveling by cutter (a small horse-drawn sleigh). He visited promising and not-so-promising regions in Iowa and Illinois and one day happened upon a lovely valley in Wisconsin Territory. He stood on the eastern bank of the Rock River, gazed at its pristine, fish-filled waters, and liked what he saw. Unbroken prairie spread far into the distance, its rich soil ideal for farming. Bur oak trees stretched their gnarly branches high on a nearby bluff, the perfect site – although he didn't know it yet – for a college.

An earlier settler, Vermonter Caleb Blodgett had purchased land from Tebo, a French-Canadian trapper and trader. On March 14, 1837, Horace White

1 Fred Burwell is the College Archivist Emeritus at Beloit College.

2 Robert K. Richardson, *The Centenary: The First Congregational Church Semi-Centennial Anniversary 1838-1938* (1938), 5.

hunkered down with Blodgett, worked out a deal for land, and then went home, where he stunned everyone with the story that he had ploughed a furrow of land in *February*. Over the next few years, citizens from Colebrook and elsewhere populated Turtle, which changed its name to Blodgett's Place, then to New Albany, and finally to the more original and euphonious Beloit.

In 1837, Dr. White commissioned a planning map, known as the Kelsou Survey, which imagined the new city as the pioneers hoped it would be. Nestled among "Canal Street" and "Hydraulic Street" appeared a "College Street." Settlers moving west from New England wanted familiar institutions, including mills, mercantile establishments, churches, and schools. The best Eastern cities also had colleges. Why not Beloit?

By 1840, the entire population of Wisconsin Territory stood at 30,945, several thousand less than Beloit's population today. As its settlers built log cabins and lived off the land, using barter and what little cash they had to purchase supplies, a New England-style village took shape. In 1838, students at Beloit's first school gathered in the kitchen of Horace White's log house, and, shortly thereafter, they began meeting at the Rock River House, a hotel built by Caleb Blodgett, where they learned their lessons huddled amidst bins of grain.[3]

Looking to the future, however, Beloiters Major Charles Johnson and Cyrus Eames visited the Territorial Legislature, seeking a charter for a new school. On December 27, 1837, the governor approved an act, which read, "That there shall be established at Beloit, in Rock County, a Seminary of learning for the instruction of young persons of either sex in science and literature, to be called The Beloit Seminary…"[4] Although they had the charter, Beloit Seminary would not open for several more years. In obtaining the charter, however, these pioneers had laid the groundwork for what would become Beloit College.

In 1842, Beloit built its first church, located on the northwest corner of Broad and Prospect Streets, and by 1843 a new school, the Beloit Seminary, had begun instruction in the church basement. Although an excellent preparatory school, it wasn't yet a college.

3 Stephen Denison Peet, "Early History of Beloit," *Beloit Journal* (1866-1867), Scrapbooks, Stephen Peet and Stephen D. Peet Collection in Beloit College Archives.

4 *Proceedings at the Presentation of the Fisher Collection of Antique Greek Sculpture: On the Occasion of the Fiftieth Anniversary of the Inception of Beloit College, June 20th, 1894* (Beloit College, 1894), 13.

2. First steps toward a college

On September 7, 1843, Congregational Church pastor, Dexter Clary, wrote to the American Home Missionary Society, hoping that they would put him in touch with the new Society for the Promotion of Collegiate and Theological Education in the West. He described the lay of the land and imparted one of the community's dreams for the future:

> This place is on Rock River—central east and west in the Territory—the village has 6. or 700 inhabitants...We are surrounded by a beautiful and excellent country which is rapidly settling. We have a meeting house nearly finished—and a High School…just commencing its operations…This school is designed to meet the wants of an extensive region round about and to grow with the growth of the country—and perhaps some day be a college…[5]

Clary and other Beloit leaders felt that it was the right time to plan the next step.

In June of 1844, a "Convention of Western Ministers and Churches" met at Cleveland, Ohio. Returning west on Lake Erie, some of the delegates gathered in a tiny stateroom on board the steamer, "Chesapeake," including Yale College alumni, the reverends Stephen Peet and Aaron Lucius Chapin, then a pastor at a Presbyterian church in Milwaukee. Chapin recalled the meeting:

> You may see seven of us crowded together in that narrow room. Stephen Peet,…foremost and chief of the founders of Beloit College, is lying on the berth, ill in body, but his fertile mind as active as ever…The Western College Society was fairly organized and a hand from the East will be stretched out to help on the establishment of genuine Christian colleges…in the West. Peet seizes on the gleam of encouragement…There is an earnest consultation — there is a fervent prayer — there is a settled purpose and Beloit College is a living conception.[6]

5 Robert K. Richardson, "How Beloit Won its College," *Wisconsin Magazine of History* (1945), 299.
6 *Exercises at the Quarter-Centennial Anniversary of Beloit College. July 9, 1872*, (Beloit College, 1872), 6.

The men set to work through a series of conventions held in Beloit during 1844-45, with plans to establish a college near the Illinois and Wisconsin border. Several communities lobbied for the college, but Beloit made the strongest case. At the third convention in May of 1845, 68 of 69 attendees voted to establish a college at Beloit. On October 23, the Beloit College Trustees convened for the first time. Yale graduate and longtime trustee, George S.F. Savage remembered:

> I wish that we had a photograph of those trustees…as they prayed, and counseled together; how without funds, without a campus, without a building, without a library, or scientific apparatus, without a faculty, with only a name to begin with, they could develop, and build up a Christian college, which should be the worthy peer of long established and fully equipped eastern institutions.[7]

Establishing a college in a remote, though growing, territory, was a daunting task. In his *Historical Sketches of Beloit College*, President Edward Dwight Eaton observed that at that time Beloit was "five hundred miles from the nearest trunk line of railroad. It required about three days' driving to reach Beloit from Chicago or Milwaukee."[8] Eaton described Beloit College as "absolutely nothing but a name, a hope, a purpose, a prayer."[9]

3. The College Site

At first, Beloit citizens had offered a 50 acre site upriver, the eventual location of Fairbanks Morse and Company, but the trustees wanted a site closer to downtown. Enter one of the city's founders, Lucius Fisher.[10] On a warm, sunny Sunday in 1837, he had climbed up to the bluff where the college now stands and gazed at the lush panorama before him. "I had an uninterrupted view of prairie such as I had never had before," he wrote, later. "I said to my friend with me that it was the most beautiful landscape view that I had ever seen."[11] Fisher purchased the property and intended to build his house overlooking the river and

7 *Semi-centennial Anniversary, Beloit College; Commencement Week, June 20-23, 1897*, (Beloit College, 1897), 34.
8 Edward Dwight Eaton, *Historical Sketches of Beloit College* (A.S. Barnes and Company, 1935), 25.
9 Ibid.
10 Lucius Fisher is also featured in McKenzie's chapter 6 "Beloit, WI 1830-1930: Beloit's Migrant and Immigrant Populations."
11 Lucius G. Fisher, "Pioneer Recollections of Beloit and Southern Wisconsin," *Wisconsin Magazine of History* (1918), 273.

an expanding downtown. Then he changed his mind. As a young man in Vermont, circumstances prevented him from obtaining the college education he had always desired. He believed in higher education and, to help the incipient college, offered his prime land on the bluff and persuaded other pioneer Beloiters to do likewise. Now, Beloit citizens donated this combined ten-acre site and, by 1846, had pledged $7,000 to fund construction of the college's first building.

Sereno T. Merrill, later a pioneer in Beloit industry, but then the principal of Beloit Seminary, recalled that, in order to show a smidgeon of progress, Lucius Fisher "had a few loads of stone hauled upon the campus"[12] to show that work was underway at last. Not long after, as Merrill noted, they officially broke ground: "Let us follow the crowd and stand beside those men of faith. A few shovelfuls of earth were removed from the spot which now marks the northwest corner of Middle College, [and] a few stones laid…"[13] However, it would take years of stops and starts to actually complete Beloit College's first building. History professor and first college archivist, Robert K. Richardson, once described the efforts to finish Middle College as "compounded of the sweat and weariness of its givers. It was an undertaking of communal dedication and personal devotion akin to the cathedral building of the Middle Ages."[14]

Meanwhile, the Trustees had prepared a college charter, enacted by the Wisconsin Territorial Legislature on February 2, 1846. And, under the tutelage of Sereno T. Merrill, several ambitious Beloit Seminary students were preparing for college.

Newspapers began to take notice of the fledgling college. One, *The American Freeman*, of Prairieville, Wisconsin, praised a decision that was not a given at the time: "We are happy to learn, among other things favorable to this rising college, that it is to be open to colored students on equal terms with others."[15] Although nearly 50 years would pass until Beloit College admitted women, it was already planning for a diverse student body. The Reverend Henry Barber, of Dutchess County, New York, had written to Stephen Peet on April 1, 1847:

12 *Proceedings at the Presentation of the Fisher Collection of Antique Greek Sculpture: On the Occasion of the Fiftieth Anniversary of the Inception of Beloit College, June 20th, 1894* (Beloit College, 1894), 19. Sereno Merrill is also mentioned in Gerbitz's chapter 7 "Celebrating Beloit's Industrial Past and Forging a Path Forward."

13 Ibid., 19-20.

14 Robert K. Richardson, "How Beloit Won its College," *Wisconsin Magazine of History* (1945), 301.

15 "Beloit College," *American Freeman* (August 18, 1847), 2.

> You know that I am an abolitionist & a friend to the colored man whether bond or free. I think it a most unreasonable thing that the free colored man should be reproached for his ignorance & at the same time be prevented from improving his mind, by being excluded from Seminaries of learning.[16]

As Professor Joseph Emerson affirmed in his tenth anniversary address, the founders accepted Barber's donation of 160 acres, which netted $1,000, "on the express condition that students should be received in the College without respect to color."[17] President Chapin alluded to the decision in his inaugural address of 1850: "[A college] must stand with open door to youth of every rank and condition in life…"[18]

The charter also included a non-sectarian clause, which ensured that, although Beloit College identified as strongly Christian, it did not require students or faculty to belong to a particular denomination, as Dexter Clary explained:

> The college is neither an ecclesiastical nor a sectarian institution. Students, in coming to it, are not questioned as to their denominational preferences, except so far as may help them to decide where they choose to attend church services. That choice once made, they are encouraged to pay due attention to the service chosen, but in all respects, the utmost religious freedom is enjoyed…[19]

Construction of the first building began in earnest after the college purchased rosy-colored bricks from Asa Curtis's kiln in Turtle Township at $3 per thousand. Citizens who had pledged labor instead of money, hauled the bricks to campus by horse teams. The building's limestone, used for windowsills and other trim, hailed from a quarry in Genesee, Wisconsin. Eventually, needing steps to the doors of the building, the college procured massive slabs of limestone from the

16 Henry Barber to Stephen Peet (April 1, 1847), Stephen Peet and Stephen D. Peet Collection in Beloit College Archives.

17 Joseph Emerson, *Address by Prof. J. Emerson and proceedings of convention at tenth anniversary of Beloit College, July 8, 1857* (Beloit College, 1857), 25.

18 Aaron L. Chapin, *Address and Discourse at the Inauguration of the Rev. Aaron L. Chapin, M.A. As President of Beloit College July 24, 1850* (Beloit College, 1850), 32.

19 *Exercises at the Quarter-Centennial Anniversary of Beloit College. July 9, 1872* (Beloit College, 1872), 14.

quarry at what is now Big Hill Park.[20]

On June 24, 1847, two thousand citizens from Beloit and vicinity crowded under the campus oaks to witness the fulfillment of their pledges to build a college. They enjoyed lively melodies from Beloit's city band, sang songs, listened to Aaron Chapin's brief history of Beloit College, and endured multiple speeches. One of the orators, Reverend Alexander Montgomery from Beaver Dam, insisted "that Western minds should be educated on Western soil and that the education of the West should be *expanded, liberal* and *democratic,* a *universally polished Westernism.*"[21]

Afterwards, the crowd moved into the open, where stonemasons had erected tentative-looking walls, ready for the bricklayers, but with a gap at the southeast corner. Officials had prepared a "leaden box" to serve as a time capsule. The *Milwaukee Daily Sentinel* reported its contents as: "the charter of the college and sundry other documents, a copy of Lapham's Wisconsin and McCabe's Directory of Milwaukee, the papers of the day and some specimens of currency, metallic and paper."[22] After sealing the box and placing it inside the cornerstone, and after another speech, workmen set the cornerstone in place, where it still resides, its date proudly carved in the soft limestone, now worn and weathered. Once dubbed "the college edifice," we know the building today as Middle College.

4. First Students

On a cold evening in early November of 1847, five students buckled down and underwent rigorous examinations in Latin and Greek, mathematics, geography, and English grammar. The following Monday, November 8, they entered Beloit College as its first students. Sereno T. Merrill continued as their instructor.

At first, they pursued their studies in the basement of the Old Stone Church, before moving to the unfinished Middle College, joined by students from Beloit Seminary. An early student, Harlan M. Page remembered, "for months, and even for years afterwards, recitations were held in rooms roughly plastered, the ceiling supported by tamarack poles, and they with the bark on."[23]

20 Helen L.D. Richardson, "Founders Struggled to Raise Middle College," *Round Table* (October 20, 1966), 3.

21 *Exercises at the Quarter-Centennial Anniversary of Beloit College. July 9, 1872* (Beloit College, 1872), 8.

22 "Beloit College," *Daily Sentinel and Gazette* (Milwaukee, June 30, 1847), 2.

23 Harlan M. Page, *Patience. An Address Before the Alumni of Beloit College Commemorative of the First*

In the fall of 1848, the college opened its preparatory department, which included sub-departments focusing on preparation for college, a "normal" department designed to prepare teachers, and a department emphasizing general education. The Preparatory Department evolved into Beloit Academy, which, through 1910, educated a large number of students from Beloit and the surrounding region, and was a vital feeder for the college proper.

Hearing rumors that Beloit College's longed for first professors might arrive any day, members of the Freshman class visited the stage office frequently, vowing to provide a warm welcome.

Joseph Collie was a member of that class. Handwritten notes by his son, George, provide insight into just how impactful the establishing of a pioneer college could be:

> He was born in Scotland, but his family came to this country when he was only 12…[They] reached the lead region of Wisconsin at Mineral Pt. He attended the country school there and soon finished what they had to offer and he went to work in a lead mine. [He was] very anxious for a higher education but there were no high schools or academies within easy reach. He had resigned himself to giving up all thought of further education and decided to follow the drab labors of a miner for the rest of his life. One spring day in 1846 he learned that the territorial legislature of Wisconsin had granted a charter to a college to be formed at Beloit, the college to open in the fall of 1847. Can you… imagine what that news meant to this Scotch lad? All at once he realized that he was to be freed from the drudgery of a miner's life to enter the realm of scholars, to associate with the great minds of the past and to fit himself to take a worthy part in this unfolding west. He hunted up a minister who had a college education and who agreed to tutor him in beginning Greek, Latin and Algebra. He spent the next year in trying to master these subjects as thoroughly as possible. In the early fall of 1847 he put a pack on his back and hitchhiked his way to Beloit. On arrival here he learned the depressing news that there was no college building only four bare walls without floors or roof and no faculty. He hunted up a trustee and asked what he should do. The trustee said

Decade, Delivered July 10, 1861 (Addison & Rublee, Book and Job Printers, 1861), 21.

> we intended to have a building ready but the money gave out and we could not finish it, but he said there will be a Middle College someday. We have appointed a faculty but they are not here, but there will be a faculty someday…On the strength of that *someday* he decided to stay.[24]

5. First Faculty

Seeking to hire its first two professors, Beloit chose Jackson J. Bushnell and Joseph Emerson, both 1841 graduates of Yale College, at a salary of $600 per year, "if we can raise it."[25]

Many years later, Emerson described his friend Bushnell as having "the soul of a poet, the mind of a scholar, the zeal of a man of business."[26] Perhaps it was Bushnell's zeal that led him to arrive in Beloit a few weeks before Emerson. What was it like to see Beloit for the first time? What was it like to be one of the first to help bring Beloit College to life? Professor Bushnell's quarter-centennial speech provides firsthand experiences:

> On the 27th of April, 1848, I came in sight of Beloit, as the lumbering stage, rose over the crest of the hill to the northeast of Roscoe…I landed from the stage at the old Rock River House…and soon found my way to the house of Rev. Mr. Clary…the Secretary of the Board of Trustees. The invitation which had brought me hither was, to come and assist in the preliminary steps for the organization of the college… It will perhaps be a marvel to the future historian, that Beloit College began to be a college upon such slender means, and upon so narrow a pecuniary basis. A few inquiries brought out the facts, that at the time of my arrival the College had no cash funds...For six months preceding my arrival, the walls of Middle College had stood floorless, windowless and roofless, without any means to finish it…[27]

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24 George L. Collie, "Tribute to the first class to enter Beloit and to the pioneers who founded the college – talk given before the students on November 5, 1947" (1947), George L. Collie Collection in Beloit College Archives.

25 *Semi-centennial Anniversary, Beloit College; Commencement Week, June 20-23, 1897*, (Beloit College, 1897), 110.

26 Joseph Emerson, *Addresses at the Inauguration of President Eaton, Beloit College, November 4, 1886* (Beloit College, 1886), 22.

27 *Exercises at the Quarter-Centennial Anniversary of Beloit College. July 9, 1872* (Beloit College, 1872), 21-22.

On May 23rd, Joseph Emerson reached Beloit after traveling by carriage for two days in steady rain. Jackson Bushnell remembered visiting with Emerson that very day:

> He came directly to my room, and almost his first question was, "Can we have a college here?" Having had some experience in building up a college in Ohio, already twenty years old, and still in peril of failure, and a vivid consciousness of our meager resources, I answered, "Yes – if we will make it." How heartily my honored colleague accepted this view, and set himself to the work of *making* a college here…[28]

One day later, on May 24, 1848, the trustees assigned the Department of Languages to Joseph Emerson and the Department of Mathematics to Jackson J. Bushnell. Another early professor, William Porter, recalled Bushnell's and Emerson's mentorship to the college's first students, but his words ring true for generations of faculty and student relationships:

> There was not one who did not feel the uplifting power of those teachers' lives, not one who had not caught something of the enthusiasm of their high purpose…Altogether the relationship of teacher and scholar had never seemed to me more beautiful. The Beloit spirit, which has always been so real and distinctive in the life of the College…was even then a pervading presence.[29]

6. Raising Money and Finishing the "College Edifice"

With a faculty of two and a tiny student body, the college's existence seemed tenuous at best. Bushnell sensed "discouragement" and "disaffection" among college supporters. "The weather beaten brick walls," he said, "seemed to tell of a community that began to build, and were unable to finish."[30]

In order to complete construction, the college needed a new subscription

28 Ibid., 23.
29 *Professor Joseph Emerson D.D., L.L.D. May 28, 1821-August 4, 1900* (1900), 8.
30 *Exercises at the Quarter-Centennial Anniversary of Beloit College. July 9, 1872* (Beloit College, 1872), 23.

from Beloit of at least $2,000. Since it seemed unlikely that the Trustees could persuade tapped out residents to give any more, one of their "sanguine and self-confident young" instructors offered to go door-to-door, as Bushnell wrote, "not to solicit subscriptions, but to talk College." Three weeks of canvassing brought renewed enthusiasm, which led to pledges of $4,000.[31]

Despite the apparent success, however, pledges did not translate into immediate cash. The lean winter and spring of 1848-49 turned into two years of economic depression and citizens paid much of the $4,000 through labor and supplies.

In the summer of 1848, the young professors continued their proselytizing missions as agents for Beloit College. Emerson set out on horseback, covering southern Wisconsin and northern Illinois, while Bushnell headed east. They hoped to raise funds to endow professorships and scholarships, while also seeking books and scientific apparatus for use by students. Among other things, Bushnell secured and shipped 100 books, a barometer, a thermometer, a rain gauge, and a hygrometer.[32]

An early student, Lucien B. Caswell, remembered their determination: "We were proud of this for it was a college and it was in the hands of a faculty that knew no failure."[33]

7. The Life of a College Student in Mid-19th Century Beloit

From the beginning, Beloit College modeled its curriculum on that of Yale. Beloit's stringent entrance examinations kept numbers in the college quite small. In addition, the college required "satisfactory testimonials of good moral character." Once accepted, students took only required courses, heavily Classics-based, along with theology, moral, natural, and intellectual philosophies, as well as mathematics and several branches of the sciences. Rhetorical training was paramount, "designed to exercise the students in elocution, composition and debate."[34]

31 Ibid., 24.
32 Helen L.D. Richardson, "The Beloit College Agency" *Wisconsin Magazine of History*, (Summer 1957), 248.
33 Lucien B. Caswell, "Beloit: The Pioneer College of the West" *Codex* (Beloit College, 1911), 21.
34 *Catalogue of the Officers and Students of Beloit College for the Academical Year, 1850-51* (Beloit College, 1851), 16.

What were conditions like for those early students? Here's Lucien B. Caswell, class of 1854:

> We all worked with an untiring industry to make up for lost years incident to pioneer life. That merciless bell on College Hill, with Collie on the rope, brought us to our feet at five in the morning. It was then a race up the hill to reach chapel in time for services. Then came a recitation and finally we returned for breakfast…Athletics, games and sports were cast aside. We were then for books and books only would satisfy us. We were ambitious to learn and were looking forward to service in that new field which our learning would open up for us…[35]

Despite a rigid schedule of prayers and studies, Beloit College students found time for extracurricular activities, conducting Sunday schools in nearby communities, founding the college's Missionary Society, and establishing The Archaean Society, a literary organization which held public meetings, debates, and guest lectures, attended by droves of citizens. The Trustees and Faculty encouraged this openness to the community, as noted by Emerson: "We believe that the College is and ought to be a power in the community. Its influence ought to be felt…in elevating and purifying the moral tone and ruling principles of the community."[36]

8. First President

Meanwhile, on November 21, 1849, the Board of Trustees unanimously approved the election of Aaron Lucius Chapin as the college's first president. He held a successful pastorate in Milwaukee and considered staying. He also felt drawn to moving back east. However, he had also been intimately connected to the college since it was simply an idea. In deciding whether to accept the offer, Chapin wrote out an eight-page self-analysis and concluded, "The College has fr. (sic) its first starting had a place near my heart…& I am willing to devote myself entirely to its interests…"[37]

35 Lucien B. Caswell, "Beloit: The Pioneer College of the West" *Codex* (Beloit College, 1911), 21.
36 Joseph Emerson, *Address by Prof. J. Emerson and proceedings of convention at tenth anniversary of Beloit College, July 8, 1857* (Beloit College, 1857), 8.
37 Robert H. Irrmann, "Milwaukee Gives Beloit a President" *Alma Mater* (April 1957), 9.

Decision made, Chapin began his duties in February and was inaugurated on July 24, 1850.

9. First Commencement

The pounding of hammers broke the stillness of a warm summer day in July 1851. A few curious students wandered over to an oak grove in the northwest corner of the campus and watched workmen cobble together two large platforms. In another day, Beloit College would graduate its first students.

July 9 dawned bright and sunny and promised heat. Campus and town gathered that afternoon under a canopy of bur oak trees. The graduation ceremony opened with music and prayer, followed by student speeches, later described by *Weekly Wisconsin* as "masterly productions, delivered with taste and effect, and would have done honor to any College in the land."[38]

Joseph Collie gave the valedictory address, entitled "To Live is to Act." He was well aware of the first class's place in history. In his words, "We have seen an entire college spring into existence."[39] Then President Chapin rose to confer the college's first degrees.

38 "Beloit – Its advantages for the Education of Youth – Beloit College – Its Examination – Plan of Instruction – Commencement Exercises – Orations – Conferring of Degrees, &c." *Weekly Wisconsin* (Milwaukee, July 16, 1851), 2.

39 Joseph Collie, "To Live Is to Act. Commencement Oration 1851" (1851) Joseph Collie Papers in Beloit College Archives.

10. Other Early Contributions from the Citizens of Beloit

Apart from donating land, labor, materials, and money, the citizens of Beloit contributed to the college in other foundational ways. Among the college library's boosters were the Young Ladies' Literary Society, which purchased and donated books, as did the Reverend Horatio N. Brinsmade, of the First Congregational Church. In time, the women also contributed cases for the College Cabinet, which consisted of geological, paleontological, ornithological and botanical specimens intended for study. The College Cabinet's small collection of Native American antiquities became the basis for the college's Logan Museum of Anthropology.

In September of 1849, members of the Congregational Sewing Society, concerned about the bachelor Professor Bushnell's sparse living quarters in Middle College, lured him away while others laid down a warm carpet, hung curtains, and upholstered an easy chair.[40]

More important to the overall life of the college, however, was their gift of the college bell, intended to ring for all college exercises. With no cash at hand, college officials hoped that the Meneely Bell Company of Troy, New York, would donate a bell. Meneely countered with an offer to discount $24.20 off a bell costing $84.20. For now, it seemed that the college would have to do without, that is, until the Congregational Sewing Society offered to pay through an installment plan. Meneely shipped the 254 pound bell, soon installed in the Middle College cupola, where it resided for the next 30 years, ringing students to breakfast at 6 a.m., to chapel services, to daily recitations, and to evening prayers at 5:30.[41]

Beloiters also contributed funding for the construction of the college's next two buildings, North College (Campbell Hall), and the College Chapel and Preparatory Department (South College), as well as for many future buildings.

Just as crucial, Beloit and surrounding communities contributed students. By 1873, for example, one-fifth of the 200 students at the college and academy hailed from Beloit.[42]

Can we have a college here? Beloit ensured that the answer was an emphatic *yes*!

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40 Henry M. Whitney, "Beloit College," in *The Columbian History of Education in Wisconsin*, edited by J.W. Stearns (State Committee on Educational Exhibit for Wisconsin, 1893), 150.

41 Helen L.D. Richardson, "Founders Struggled to Raise Middle College," *Round Table* (October 20, 1966), 3.

42 *Annual Catalogue of the Officers and Students of Beloit College for the Academical Year 1873-4* (1873), 5-13.


BELOIT COLLEGE.
BELOIT, Wis.

References

(1873) *Annual Catalogue of the Officers and Students of Beloit College for the Academical Year 1873-4*. Beloit, WI: Beloit College.

Barber, Henry (1847), Henry Barber to Stephen Peet, April 1, 1847. Stephen Peet and Stephen D. Peet Collection, Beloit College Archives.

(1847), "Beloit College." *American Freeman* (Prairieville, WI). Vol. 3, No. 41, August 18, 1847: 2.

(1847), "Beloit College." *Daily Sentinel and Gazette* (Milwaukee, WI). Vol. II (New Series), No. 117, June 30, 1847: 2.

(1851), "Beloit – Its advantages for the Education of Youth – Beloit College – Its Examination – Plan of Instruction – Commencement Exercises – Orations – Conferring of Degrees, &c." *Weekly Wisconsin* (Milwaukee, WI). Vol. 5, No. 8, July 16, 1851: 2.

(1936), *The Book of Beloit 1836-1936*. Beloit, WI: Beloit Daily News Publishing Company.

Caswell, Lucien B. (1911) "Beloit: The Pioneer College of the West." *Codex*: 1911, Beloit, WI: Beloit College: 21-22.

(1851) *Catalogue of the Officers and Students of Beloit College for the Academical Year, 1850-51*, Beloit, WI: Beloit College.

Chapin, Aaron L. (1850), *Address and Discourse at the Inauguration of the Rev. Aaron L. Chapin, M.A. As President of Beloit College July 24, 1850*. Beloit, WI: Beloit College.

Collie, George L. (1947), "Tribute to the first class to enter Beloit and to the pioneers who founded the college – talk given before the students on November 5, 1947." George L. Collie Collection, Beloit College Archives.

Collie, Joseph (1851), "To Live Is to Act. Commencement Oration 1851." Joseph Collie Papers, Beloit College Archives.

Eaton, Edward Dwight (1935), *Historical Sketches of Beloit College*. 2nd ed. New York, NY: A.S. Barnes and Company.

Emerson, Joseph (1857), *Address by Prof. J. Emerson and proceedings of convention at tenth anniversary of Beloit College, July 8, 1857*. Beloit, WI: Beloit College.

Emerson, Joseph (1886), *Addresses at the Inauguration of President Eaton, Beloit College, November 4, 1886*. Beloit, WI: Beloit College: 22.

(1872), *Exercises at the Quarter-Centennial Anniversary of Beloit College. July 9, 1872*. Beloit, WI: Beloit College.

Fisher, Lucius G. (1918), "Pioneer Recollections of Beloit and Southern Wisconsin." *Wisconsin Magazine of History*. Vol. 1, No. 3, March: 266-286.

Irrmann, Robert H. (1972), "Introspection. The Commencement Address April

17, 1972." Beloit, WI: Chapin Society.

Irrmann, Robert H. (1957), "Milwaukee Gives Beloit a President." *Alma Mater*, IV, April 1957: 6-10.

Luebke, Arthur L. (1985), *Pioneer Beloit*. 3rd ed. Beloit, WI: Beloit Historical Society.

(1894), *Proceedings at the Presentation of the Fisher Collection of Antique Greek Sculpture: On the Occasion of the Fiftieth Anniversary of the Inception of Beloit College, June 20th, 1894*. Beloit, WI: Beloit College.

(1900), *Professor Joseph Emerson D.D., L.L.D. May 28, 1821-August 4, 1900*: 8.

Page, Harlan M. (1861), *Patience. An Address Before the Alumni of Beloit College Commemorative of the First Decade, Delivered July 10, 1861*. Madison, WI: Addison & Rublee, Book and Job Printers.

Peet, Stephen Denison (1866), "Early History of Beloit." *Beloit Journal*, 1866-1867, clippings in scrapbook. Stephen Peet and Stephen D. Peet Collection, Beloit College Archives.

Richardson, Helen L.D. (1957), "The Beloit College Agency." *Wisconsin Magazine of History*. Vol. 40, No. 4, Summer 1957: 247-254.

Richardson, Helen L.D. (1966), "Founders Struggled to Raise Middle College." *Round Table*. Vol. CXV, No.6, October 20, 1966: 3.

Richardson, Robert K. (1938), *The Centenary: The First Congregational Church Semi-Centennial Anniversary 1838-1938*. Beloit, WI.

Richardson, Robert K. (1945), "How Beloit Won Its College." *Wisconsin Magazine of History*. Vol. 28, No.3, March: 290-306.

Richardson, Robert K. (1938), "The Non-sectarian Clause in the Charter of Beloit College." *Wisconsin Magazine of History*. Vol. XXII, No.2, December: 127-155.

(1897), *Semi-centennial Anniversary, Beloit College; Commencement Week, June 20-23, 1897*. Beloit, WI: Beloit College.

Whitney, Henry M. (1893), "Beloit College." In *The Columbian History of Education in Wisconsin*. Edited by J.W. Stearns. Milwaukee, WI: State Committee on Educational Exhibit for Wisconsin: 133-153.

An Analysis of Female Labor Force Participation: a Historical Case Study on Beloit, Wisconsin

Louise Claussen[1]

1. Introduction

The relationship between gender and the economy has been studied and analyzed by countless scholars seeking to understand their complex interactions. For example, the 2023 Nobel Memorial Prize in Economics was awarded to Claudia Goldin for her advancements in the study of women's labor market outcomes, reinforcing the importance of this field of study. There are countless questions to ask within this field, such as: how does women's economic participation impact their political freedom? Or how has their introduction into the labor market affected the economy? Goldin, in particular, analyzes the relationship between women, marriage, and labor force participation in several of her works, including "The Quiet Revolution That Transformed Women's Employment, Education, and Family" (2006) and "Life-Cycle Labor-Force Participation of Married Women: Historical Evidence and Implication" (1989). Drawing on this work, I explore further the relationship between female labor force participation and marriage rates, using Beloit, Wisconsin as a case study.

Furthermore, the 2023 Beloit College Miller Upton Scholar, Joel Mokyr, and his work *A Culture of Growth* (2016) has been a source of inspiration for this paper. While his research focuses on the economic history of Europe, his

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methodology and "evolutionary model" for understanding economic history have been influential in the formulation of my research question. In his work, Mokyr applies the evolutionary model to understand how culture changes over time. An evolutionary approach "supplies a framework for explaining the evolution of complex, undesigned outcomes over time, and it involves both the adaptation of cultural beliefs to changing circumstances and the elimination of others through selection" (2016: 28). Furthermore, he argues that "cultural elements themselves, and not their carriers [people], are subject to evolutionary forces" (2016: 24). Using an evolutionary approach to study economic history is illuminating in many ways– it can provide a helpful framework for understanding cultural changes over time, including why some cultural ideas and institutions prevailed over others.

Mokyr argues that an evolutionary approach "gives us more reasonable ways of thinking about how and why historical trajectories were followed" (2016: 32). Although Mokyr uses an evolutionary approach to cover centuries of change, I believe that this evolutionary model is still applicable to the topic at hand. The change in female labor force participation rate is both a cultural and economic change, which indicates the adaptation of certain beliefs regarding the status of women and the elimination of others. My analysis also differs from Mokyr as in this paper I use census micro-data, instead of larger-scale, qualitative, historical data. However, this data can reveal trends that point to a broader historical picture of economic, political, and social changes happening with the role of women in the United States.

Increasingly, scholars are using large data sets to analyze economic history. Economist Ran Abramitzky (2015: 1248), in a paper on trends in economic history states,

> ...Recently there has been a huge surge in the availability of high-quality micro-level historical data. Full-count historical censuses of population, birth records, death records, military enlistments, and marriage certificates are being digitized. Computing technology enables economic historians to construct new data sets by linking individuals across data sources, tracing people over time and across space from birth, through marriage and work, through death and then follow their children… These developments put history in a unique position to address questions that require both micro data and a long-term perspective, such as the determinants and consequences

of intergenerational mobility and the long term consequences of historical events and policies.

In particular, economic historians can use census micro-data to analyze trends in many different research areas including income, poverty, labor force participation, education, and migration. Researchers such as Berkes, Karga and Nencka (2023) have further enriched existing census data analysis methodologies through projects such as the "Census Place Project: A Method for Geolocating Unstructured Place Names."

My research draws on these sources to present a descriptive analysis of the relationship between marriage and labor force participation rates from 1910 to 1950 in Beloit, Wisconsin, and to determine whether these trends fit with the existing literature on this topic. First, I will review literature from Goldin and other relevant sources on female labor force participation, specifically looking at the history of female labor force participation rates and marriage rates in the United States. Then, I present my data source, IPUMS, and an overview of available census data for Beloit from 1910-1950 (for more details on how I extracted my data, see Appendix A). Finally, I present my research findings and determine whether they are compatible with the literature.

2. The Evolution of Women in the Labor Market

The most important piece of literature that I used to guide my research is Goldin's "The Quiet Revolution That Transformed Women's Employment, Education, and Family" (2006). This work serves as the basis for my research, as she comprehensively breaks down the evolution of married women's participation in the workforce arguing that the modern economic role of women emerged in four phases. Phase one spanned from the late nineteenth century to the early 1920s, in which female work was characterized by the "independent female worker." This usually meant that unskilled, young, and unmarried women worked low-skilled jobs. The majority of these women were piece workers, in manufacturing or service sector jobs such as domestics or laundresses. A small minority were professional workers, in teaching and clerical occupations, although this group began to expand in the 1910s. Due to the social stigma associated with married women working before the 1920s women were expected to leave the workforce

at marriage. This was due in part to the nature of the work, which was often dangerous, dirty, and required long hours.

The second phase occurred from 1930 to 1950 and saw an increase in the labor force participation rate of married women specifically. This was due to various factors, including the increase in demand for office and clerical work and the growth in high school enrollment and graduation rates from 1910 to 1930. Both of these factors contributed to the changing of social stigmas around women's work, as women entered cleaner, more "respectable" jobs that required shorter hours. Some women continued to work after marriage, although considerable change did not occur until the 1940s. The rise of part-time employment during the 1940s and 50s meant more flexibility for married women in the workforce. Furthermore, advancements in household technologies such as refrigerators and washing machines, meant that women spent less time on household work.

Phase three took place from the 1950s to the 1970s and saw a rapid increase in married women's labor force participation rate. Changing social attitudes towards women's labor meant an increase in labor force participation, and importantly higher demand. Again, the creation of scheduled part-time employment played a large role in the increase in married women's ability to participate in the labor force. At the same time, the almost complete end of marriage bars signified the greater social acceptance of married women's employment. However, while their human capital was increasing, it was usually increasing outside of the scope of their job and advancements within their fields were stagnant.

Finally, Goldin characterizes the period from the 1970s to the present as the "quiet revolution." She identifies three factors of women's choices that distinguish the first three phases from the last: horizon, identity, and decision-making. What characterized the "quiet revolution" was the changing attitudes of women towards work– they began to see their career as a primary focus of their life instead of categorizing it as something to fall back on. This, along with the advent of contraception, and increases in divorce rates gave women more autonomy and they began to place careers on equal or higher status to marriage. In my research, I examine the time from 1910 to 1950, so I am focusing on Goldin's explanations of the first and second phases of the evolution of women's labor force participation.

To compare the data that I present on women's labor force participation, marriage rates, and other descriptive statistics, I am presenting a brief history of these factors in the United States. Although the female labor force participation rate did rise from 1900 to 1950 in the United States, it did so only modestly.

Statistics show that in 1900 the FLFPR was around 20.40% and by 1950 had only grown to 28.60% – the more significant jump in the female labor force participation occurred mostly after 1950, as the rate rose to 40.45% in 1960 (Ortiz-Ospina et al. 2018).

This remains consistent with the literature on female labor force participation in the 20th century. There are a variety of factors that influenced this change. For example, many people have credited the beginning of World War II with the rise of female labor force participation. While it is true that women joined the labor force in record numbers during these years, it is also true that by 1946, the female labor force participation rate had returned almost to pre-war levels (Rose 2018). Instead, long-run changes in female employment were likely due to changing economic and social trends such as increases in part-time employment, advancements in education, elimination of "marriage bar" laws and policies, and in particular, access to contraception (Goldin 2006). Furthermore, most of the long-run increase in female labor force participation is specifically attributable to the increase in married women's participation, which has more than doubled since 1955, while overall single women's participation increased by much less (Engemann and Owyang 2006).

While female labor force participation rates rose modestly from 1900 to 1950, the age at first marriage remained relatively constant. Data from the U.S. Census Bureau shows that the average age at first marriage in 1900 was approximately 21.9, while the average age was 20.3 in 1950 (U.S. Census Bureau 2023). The age at first marriage did not begin to increase until the late 1970s and 1980s, which allowed women to take their education more seriously. Similarly, during the 1960s onwards, the period divorce rate began to rise. The combination of the later age at first marriage and the rising divorce rate meant that the average amount of time women spent married declined, and economic independence became more valuable- propelling women into the workforce (Goldin 2006).

Furthermore, to compare the percentage of women married in Beloit, WI to the national average, I examined IPUMS 1% data from each decade, which is representative of the population. I found that the percentage of women who were married in the United States gradually increased from 1910 at 66.07% to 74.54% in 1950. These figures are consistent with the data from Beloit, WI, as the percentage of women married increased from 66.17% in 1910 to 73.26% in 1950. This is consistent with the existing literature which states that the proportion of women married in the United States reached its peak around 1950.

This is due to a variety of societal and economic factors that emphasized the importance of the nuclear family after the end of World War II.

3. Early 20th Century Census Data on Women in Beloit, Wisconsin

In this research paper, to examine the economic history of women in Beloit, Wisconsin I use IPUMS USA Full Count data from 1910 to 1950. There are several variables that I am looking at including age, marriage status, labor force status, employment, and class of worker. My primary focus is calculating the labor force participation rate of married and unmarried women over time to identify trends. I use Goldin's framework on the four phases of the modern economic role of women and analyze whether the data from women in Beloit support this framework. She identifies the first phase as spanning from the late 19th century to the early 1920s, so I will be using IPUMS USA Full count data from 1910, and 1920 to see if there is a lower labor force participation rate among married women. Although IPUMS USA full count census data is available from the year 1900, the variable for participation in the labor force is not available so I have chosen not to include it in my research. The second phase she identifies spans from 1930 to 1950, so I will be using full census data from 1930, 1940, and 1950 to see if the labor force participation rate increased among women who were married.

Below are two tables that provide descriptive statistics on the variables that I have used for my analysis.

Table 1: *Descriptive Statistics for Age, 18 (min) - 65 (max) years old*

Year	# of Obs.	Mean	S.D.	Median
1910	4,720	35.49	12.73	33
1920	6,362	36.61	12.98	35
1930	7,620	37.17	12.83	36
1940	8,494	38.50	13.14	38
1950	9,799	38.99	13.62	38
Total	36,995	37.65	13.18	36

Table 2: *Dummy Variable Statistics Table, Totals for 1910-1950*

Variables	Labels	Codes	Count	Percent
Sex	SEX	1 Male	0	0%
		2 Female	36,995	100%
Marital Status	MARST	1 Married, Spouse Present	25,517	68.97%
		2 Married, Spouse Absent	866	2.34%
		3 Separated	102	0.28%
		4 Divorced	813	2.20%
		5 Widowed	2,416	6.65%
		6 Never Married/ Single	7,236	19.56%
Labor Force Status	LABFORCE	1 No, not in the labor force	25,943	70.13%
		2 Yes, in the labor force	11,051	29.87%
Employment Status	EMPSTAT	1 Employed	9,000	29.38%
		2 Unemployed	329	1.07%
		3 Not in the Labor Force	21,161	69.08%
		9 Unknown	142	0.46%
Class of worker	CLASSWKR	0 N/A	25,777	69.68%
		1 Self-employed	1,018	2.75%
		2 Works for Wages	10,188	27.54%
		9 Unknown	12	0.03%

4. Analyzing Female Labor Force Participation in Beloit, WI (1910-1950)

I found through my research that the trends of female labor force participation follow what is commonly known in the literature. Looking at the overall labor force participation for women in Beloit it increases steadily from 1910 to 1950. It is somewhat difficult to obtain data on overall female labor force participation during this period (the Federal Reserve data begins in the late 1940s). However, I have chosen both to use data provided by Our World in Data, which is based on OECD data and to use the same methodology to analyze IPUMS 1% data from the same period.

Table 3: Female Labor Force Participation Rate

Year	FLFPR Beloit	FLFPR United States OECD	FLFPR United States IPUMS 1%
1910	25.64%	22.80%	26.11%
1920	25.54%	23.30%	24.52%
1930	27.03%	24.30%	26.67%
1940	30.00%	25.40%	29.71%
1950	36.82%	28.60%	30.63%

Interestingly, the overall female labor force participation rate was higher for every individual year than what is estimated on the national level, except when comparing the FLPR in 1910 to the U.S. 1% averages. Readers should be aware that data provided by the OECD includes women who are economically active over the age of 15, while the U.S. data begins at age 18. The female labor force participation rate within Beloit also increased by a larger margin over this period, as in Beloit it increased by 11.18 percentage points, while in the OECD data, it only increased by 5.8 percentage points, and in the IPUMS 1% data it increased by a similar amount, 6.11 percentage points. The larger increase in labor force participation coincides with the beginning of World War II and could be connected to Beloit's history as an industrial town and home to Fairbanks Morse, which produced war materials. However, without more historical data on the occupations of women, this is merely speculation.

Turning towards overall marital status, we see that there is an overall increase from 1910 to 1950. I use IPUMS 1% data to compare the women's marriage rate in Beloit to the national average.

Table 4: Marriage Percentage

Year	Percent Married Beloit	Percent Married U.S.
1910	66.17	66.07
1920	70.89	68.49
1930	71.83	68.99
1940	71.8	68.83
1950	73.26	74.54

The percentage of women married in Beloit is similar to the national average, with both increasing approximately 8 percentage points over the period. For most years, besides 1950, the marriage rate in Beloit was higher than the national average. This is interesting considering that both the percentage of women married and the female labor force participation rate is higher than the national average. This could potentially indicate that more married women were in the labor force than the national average. However, it is important to note that while calculating overall marriage rates in Beloit I included both marital status options married, spouse present, and married, spouse absent.

Finally, to look at the breakdown of female labor force participation data by marital status, I first calculated the distribution across all possible marital statuses, including married: spouse present, married: spouse absent, divorced, widowed, and single. Taking the year 1910 as a case study, we can see just how drastically labor force participation is impacted by marital status.

Table 5: Labor Force Status by Marital Status (1910)

Marital Status	Not in LF	In LF	Total	LFPR
Married, Spouse Present	2790	165	2955	5.58%
Married, Spouse Absent	82	86	168	51.19%
Divorced	18	28	46	60.87%
Widowed	210	90	300	30.00%
Never Married/ Single	410	841	1251	67.23%
Total	3510	1210	4720	25.64%

The data presented here illustrates just how much of an effect marital status can have on female labor force participation. In the year 1910, married women (whose spouses were present) made up 62.61% of the female population between the ages of 18-65, however, their labor force participation rate was by far the lowest, at only 5.58%. Unsurprisingly, the group with the highest labor force participation rate was women who were never married/single with a participation

rate of 67.23%. One interesting thing I found in my research was the labor force participation rate of married women, whose spouses were absent. Although they made up a small percentage of the sample size– about 3.6%, they had a very high labor force participation rate, with about 51.9% of them present in the labor force. This is likely due to a variety of factors– married women with absent spouses potentially had to join the workforce out of necessity to maintain their household consumption levels for themselves and their children. However, it is possible that they also received financial support from their spouse or other family members. For this reason, I chose not to include this marital status in either the labor force participation rate of married women or the labor force participation rate of unmarried women. In 1910 the labor force participation rate of married women excluding those without their spouses present was 5.58%. If I included married women with their spouses absent in this figure the labor force participation rate would rise to 8.04%, which is a substantial enough difference that I chose not to include them.

Graph 1: Labor Force Participation by Marital Status

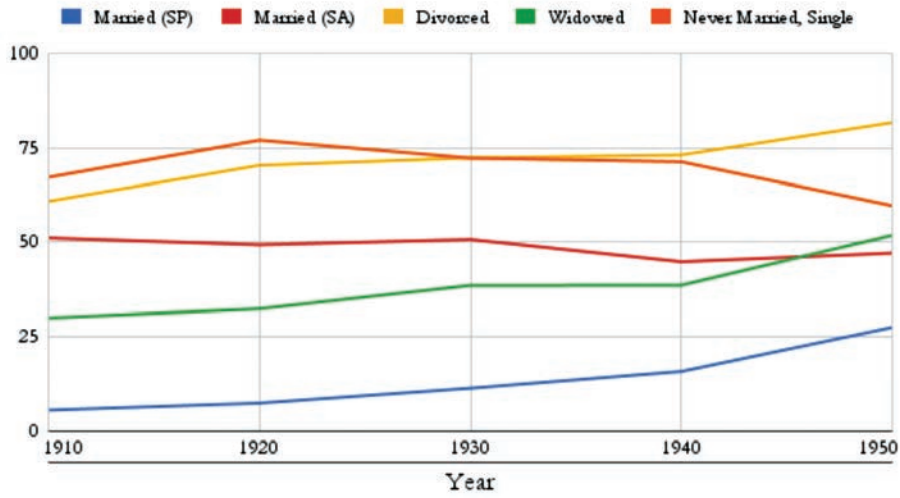

Table 5 shows the labor force participation rate by all marital statuses over the period from 1910 to 1950. The lowest among all five decades is married women with their spouses present, although it does rise significantly from 1910 to 1950, which I will be examining next. The highest labor force participation rate is among single women, which peaks in 1920 at 77.02% and then surprisingly

declines to 71.3% in 1950. Interestingly, the labor force participation rate among widowed women rose the most out of all statuses between 1940 and 1950, with a 13.23% increase. A comparatively high labor force participation rate is among divorced women, whose rate was 60.87% in 1910, which rose to the highest labor force participation rate at 81.69% in 1950.

To look at the overall labor force participation rate in a more condensed way, I compared the labor force participation rates of married women (married, spouse present) and unmarried women (divorced, widowed, single). I also included the total female labor force participation rate for comparison. I then also compared these figures to the national averages using IPUMS 1% data.

Table 6: Labor Force Participation by Marital Status, Beloit

Year	Married LFPR	Unmarried LFPR	Total LFPR
1910	5.58	60.05	25.64
1920	7.44	66.04	25.54
1930	11.40	64.51	27.03
1940	15.86	63.17	30.00
1950	27.53	60.95	36.82

Table 7: Labor Force Participation by Marital Status, United States

Year	Married LFPR	Unmarried LFPR	Total LFPR
1910	9.43	55.70	26.11
1920	7.62	57.81	24.52
1930	10.41	58.85	26.67
1940	13.76	59.90	29.71
1950	19.99	60.23	30.63

The figures above show the percentages for married and unmarried women's labor force participation. There are a few interesting trends to note here. First of all, the labor force participation rate of married women in Beloit increased steadily from 1910 to 1940. In 1910 the total labor force participation rate for married women was 5.58%, and by 1950 it had increased by almost 400% to 27.53%. While this statistic is still relatively low in comparison to the participation of

unmarried women it does show that married women were beginning to enter the workforce in increasing numbers before the beginning of World War II.

Another interesting trend to note is the decrease in unmarried women's participation. Unmarried women's labor force participation in Beloit peaked in 1920 at 66.04% and then declined almost to the level it had been at in 1910, to 60.95% in 1950. This could indicate that unmarried women were less affected by the social and economic changes over the beginning to mid-20th century that were pushing married women into the workforce. Since the labor force participation rate of unmarried women did not increase much between 1910 and 1920, the increase in the total female labor force participation rate from 25.64% in 1910 to 30.63% in 1950 must have been driven by the entrance of married women into the labor force.

Similarly, the data from the entire United States shows an increase from 9.43% in 1910 to 19.99% in 1950 among married women, however, the total female labor force participation rate did not change as drastically, with only a 4.52 percentage point increase. The most important thing to take away from this data is the clear and significant difference between labor force participation rates between married and unmarried women, as well as the significant increase in married women's labor force participation rates.

I have also included data on the average age for women in Beloit broken down into four categories: overall mean age, married, unmarried, and single.

Table 8: Age Averages Beloit

Year	Overall Average	Married	Unmarried	Single
1910	35.5	37.3	31.4	26.5
1920	36.6	37.8	33.9	27.5
1930	37.2	38.3	34.4	28.4
1940	38.5	39.6	33.9	28.9
1950	39.0	39.9	38.7	28.8

One interesting thing to note is that the average age of unmarried/single women increased slightly from 1910 to 1940. This is potentially due to the fact that women began to wait longer to get married after entering the workforce at

a young age. However, the overall average age of women in Beloit also increased over this time, as did the average age of married women, so there could be a general increase in the average age of the population to account for this trend.

Finally, I also looked at the class of workers, which was divided into "self-employed" or "works for wages."

Table 9: Class of Worker (Overall)

	Class of Worker	
Year	Self-Employed	Works for Wages
1910	18.72%	81.28%
1920	10.58%	89.42%
1930	5.66%	94.34%
1940	5.62%	94.34%
1950	9.83%	90.17%

The number of women in the workforce who worked for wages, rather than were self-employed increased significantly from 1910 to 1930, after which it leveled off. This mirrors what we would expect to see as married women enter the workforce to work for wages rather than being self-employed or working from home. Surprisingly, this trend shifted in the 1950s trend as the number of women self-employed rose, and the number of women working for wages declined. This could potentially be explained by the movement of women out of the labor force after the end of World War II.

I also included data on the class of workers for married women specifically.

Table 10: Class of Worker (Married, spouse present)

	Class of Worker (Married, spouse present)	
Year	Self-Employed	Works for Wages
1910	61.36%	38.64%
1920	22.97%	77.03%
1930	7.58%	92.42%
1940	7.73%	92.27%
1950	12.32%	87.82%

This data shows the drastic movement from self-employment to working for wages that occurred from 1910 to 1930. In 1910 61.36% of married women in the workforce were self-employed, and by 1930 that number had dropped to only 7.58%. This follows the overall trend that we see of an increase in women choosing to work for wages, however even by 1950 a higher percentage of married women were self-employed than the overall average. The rise in self-employment among married women from 1940 to 1950 mirrors the overall trend that we see among all women.

5. Conclusion

Overall, the data available on female labor force participation in Beloit heavily supports the claims made by economic scholars about the changing roles of women in the labor force over the early to mid-twentieth century. Specifically, the data supports Goldin's work "The Quiet Revolution That Transformed Women's Employment, Education, and Family" on the four phases of the history of women joining the labor force. She notes that the period from 1900 to 1920 would be characterized by a low female LFPR among married women, due to women leaving the workforce upon marriage, which is reflected in the data shown, as married women's LFPR was 5.58% and 7.44% in 1910 and 1920 respectively. During this period, the majority of the female labor force was made up of women who were never married/single, in 1910 they made up 70% of the female labor force and in 1920 they made up approximately 63% of the labor force.

In phase two, the period from 1930 to 1950, she notes the increase in married women's labor force participation rate due to factors such as increased enrollment in education (specifically high school), as well as increased demand for clerical work. This is also reflected in the data, as the female LFPR was 11.40% in 1930 and 15.86% in 1940. While these numbers are not close to the labor force participation rate of unmarried women, the steady increase in the total labor force participation rate along with the stagnation of the unmarried women's labor force participation rate indicates that the increase in the total was driven by married women's entrance to the workforce.

The trend of married women's increase in labor force participation can likely be explained by numerous factors presented by some of the scholars I have mentioned, as well as various political and social factors such as the changing roles of women in the household and the changing of "marriage bars." Economic

factors such as increased demand for female labor due to the economic effects of the New Deal, the shift towards factory-based work over household work, and increased efficiency in technology all likely play some role in this trend as well. More research on the specific occupations of married and unmarried women in the labor force, as well as on the educational attainment and monetary income of these workers, would be needed to determine the overall cause and effect of these trends, as well as the geographic-specific history of industries and job availability. Finally, one interesting trend I found in my research was the drastic decrease in self-employed women in the labor force, particularly among married women. This is likely caused by changing social perceptions around women's role in the workforce, but more specific data would have to be reviewed on the relationship between social attitudes and women's labor force participation.

My analysis of the labor force participation rate of married women in Beloit supports the claims that Goldin has made on the development of women's employment. However, Beloit's rich and interesting history and the lives of the women who lived there cannot all be captured by census microdata. Certainly, there are many more trends to be explored on how other variables like their education, immigration status, race, and income all affected their choice to work which can be explored through further research.

Appendix A: Notes on how the data was extracted

For clarity and replication, I will provide a brief step-by-step explanation of how I obtained my data. On the IPUMS website, I chose to create my custom data set and then select samples. I chose to look at the IPUMS full census data instead of the 1% sample from each decade for a few reasons. First, looking at the full census data had a better chance of providing me with the variables that I was interested in. Although the samples from the 1% data are representative of the entire population, there were restrictions on the variables available. For example, in the 1950 1% sample, only places of at least 100,000 population could be identified with any geographic variable, and in the 1960 1% sample the smallest identifiable geographic unit was the state. Also, although the full census data has millions of data points, because I was looking specifically at Beloit, WI, I wanted the largest sample size available to me.

Secondly, I chose the variables that I wanted to look at. Narrowing and refining the census data is one of the last steps I performed after I selected all of my variables. For my geographic variable, I chose to look at 'City' so that I could exclusively look at the City of Beloit WI. I also chose to look at the most important demographic variables, including sex, age, and marital status. The final type of variable I wanted to look at was work, for which I chose employment status, labor force status, class of worker, and occupation. It is important to note that I did not end up using all of these data points to reach my findings, as their availability varied by year selected.

To refine this data, I selected specific cases for some of my variables. For the variable city, I chose Beloit, WI (code 0704), for the variable sex, I chose to only look at female data (code 2) and finally, for age, I chose to only look at citizens between the ages of 18 and 65, to make sure that I was focusing on women who would have the option to be in the labor force. Although historically the ages that women have started and stopped working have varied over time, I chose this range for a few reasons. One, I did not want my data to be impacted by child labor laws that were passed in the early to mid-twentieth century, so I chose 18 as the youngest age to examine. Secondly, I did not want my data to be impacted by changing the average retirement age, specifically with the introduction of social security in the 1930s and 1940s. Although I know that choosing this range may risk including some data from under or over the selected range, I believe that this range gives me access to the broadest sample size while maintaining consistency

across decades. Finally, I made sure that my data was compatible with STATA, so I changed the format from fixed-width text (.dat) to Stata (.dta), and I submitted the extract.

To determine labor force participation rates of married and unmarried women I downloaded the IPUMS data into STATA. The first variable I was interested in is marital status, which is coded into six separate categories: married: spouse present, married: spouse absent, separated, divorced, widowed, and unmarried. The census data from 1910 to 1950 tracks five of these- both marriage variables, as well as divorced, widowed, and unmarried. The data available for 1950 also tracks a sixth category, separated. Before I examined this variable with labor force participation, I chose to look at the overall percentage of women married. I first looked at all of the data available for each year- and then I calculated the marriage rate by changing marriage to a binary variable, so married (married: spouse present and married: spouse absent) = 1 and unmarried (divorced and unmarried) = 0.

Secondly, I wanted to examine the overall labor force participation rate by year, before examining the connection with marital status. To do this I calculated the overall labor force participation rate for each year from 1910 to 1950 for all women who resided in Beloit, Wisconsin who were working age. The process of doing this in STATA just requires tabulating the variable for laborforce by each year. My goal here was to see if the female labor force participation rate in Beloit Wisconsin follows the trends that we would expect to see throughout the early to mid-twentieth century.

Next, I calculated the labor force participation rate of married women and unmarried women from 1910 to 1950. First I created a detailed breakdown of the labor force participation rate by marital status. This included looking at the labor force participation rate for all five types of marital status, across all five decades. My goal here was to see if there were any outliers within the data, and to just generally have a more complete picture of how specific marital status impacted labor force participation.

I then calculated the labor force participation rate for married women and unmarried women, choosing to include married, spouse present in the category of 'married', and divorced, widowed, or never married in the category of 'unmarried'. I chose not to include 'married, spouse absent' in the category of 'married' because the labor force participation rate for this group was significantly higher than the labor force participation rate of those who were 'married, spouse present'. I then compiled these data points to identify any trends in changing labor force

participation. Finally, I also examined the variables of age and the class of the worker by marital status. To do this I first calculated the mean age of all women across all five decades, then I calculated the mean age of 'married' and 'unmarried' (using the same classifications as I have been). Finally, I was also interested in calculating the mean age of those who were 'single/never married' across all five decades. To examine the class of the worker, I first tabulated the variable by all five decades, to give an overall picture. Then, I tabulated the class of the worker correlated to the new variable 'married', which gave me the breakdown of whether married women were self-employed or worked in the labor force. However, this also showed the breakdown for those classified as 'unmarried', which included 'married, spouse absent'. Finally, to maintain consistency, I tabulated my new variable 'unmarried' which did not include married spouse absent, with the class of the worker, to determine any trends.

References

Abramitzky R. Economics and the Modern Economic Historian. The Journal of Economic History.
2015;75(4):1240-1251.

Berkes, Enrico, Ezra Karger, and Peter Nencka. 2023. "The Census Place Project: A Method for Geolocating Unstructured Place Names." *Explorations in Economic History*, Methodological Advances in the Extraction and Analysis of Historical Data, 87 (January): 101477. https://doi.org/10.1016/j.eeh.2022.101477.

Engemann, Kristie and Michael Owyang. 2006. "Social changes lead married women into labor force." *The Regional Economist* (Apr), 10-11

"From Beloit Iron Works To Beloit Corporation." n.d. Beloit Historical Society. Accessed March 20, 2024. https://www.beloithistoricalsociety.com/ironworks.php.

Goldin, Claudia. 1989. "Life-Cycle Labor-Force Participation of Married Women: Historical Evidence and Implications." *Journal of Labor Economics* 7 (1): 20–47.

———. 2006. "The Quiet Revolution That Transformed Women's Employment, Education, and Family." *The American Economic Review* 96 (2): 1–21.

Maxwell, Nan L. 1990. "Changing Female Labor Force Participation: Influences on Income Inequality and Distribution." *Social Forces* 68 (4): 1251–66. https://doi.org/10.2307/2579143.

Mokyr, Joel. 2016. *A Culture of Growth: The Origins of the Modern Economy*. Princeton University Press.

Ortiz-Ospina, Esteban, Sandra Tzvetkova, and Max Roser. 2024. "Women's Employment." *Our World in Data*, March. https://ourworldindata.org/female-labor-supply.

Rose, Evan K. 2018. "The Rise and Fall of Female Labor Force Participation During World War II in the United States." *The Journal of Economic History* 78 (3): 673–711. https://doi.org/10.1017/S0022050718000323.

US CENSUS BUREAU. 2023. "Estimated Median Age at First Marriage, by Sex: 1890 to Present." https://www.census.gov/data/tables/time-series/demo/families/marital.html.

Vasist, Pramukh Nanjundaswamy, Debashis Chatterjee, and Satish Krishnan. 2023. "The Polarizing Impact of Political Disinformation and Hate Speech: A Cross-Country Configural Narrative." *Information Systems Frontiers*, April, 1–26. https://doi.org/10.1007/s10796-023-10390-w.

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