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CONFLICT AND MODERNITY IN NEW SOUTH FLORIDA'S PHOSPHATE MINES, 1900-
1930

by

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B. A. University of Central Florida, 2013

A thesis submitted in partial fulfillment of the requirements
for the degree of Master of Arts
in the Department of History
in the College of Arts and Humanities
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ABSTRACT

This thesis places Florida's phosphate industry in the context of the New South and the state's fitful emergence into modernity. Historian Paul Ortiz has identified a long trend of “Florida exceptionalism” – the idea that Florida has been exempt from the conflicts characteristic of the New South. These conflicts are rooted in racial violence and inconsistent industrialization, which resulted in lagging wages, labor struggles, overproduction crises and sporadic capital investment. These Southern trends are likewise rooted in a national narrative of modernization, despite a tendency to consider the New South as in some sense outside of modernity.

I argue that Florida has not been exempt from the conflicts characteristic of the New South or of modernity, and that the phosphate industry between 1900 and 1930 strikingly demonstrates these conflicts. Florida phosphate mining was one of the most capitalized and developed industries in Florida during these years; yet it has received essentially no attention from historians working in the relevant historiographies of labor, race, mining technology and political economy. In placing the industry into these contexts, the thesis proceeds analytically rather than narratively, making the argument by examining the industry from three distinct, but interrelated, perspectives, posed at increasing levels of generality: first, examining labor conflict and interracial organization in the industry; second, examining competitive pressures and technological change and third, examining the industry's vertical integration into the national fertilizer market.

to Chelsea

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INTRODUCTION

The phosphate industry in Florida developed in the 1890s after the discovery of phosphate rich soils in and around Polk County in the preceding decade. Goaded on by an eager local press, this early industry was characterized by its land speculation and propensity for volatility, bankruptcies and mergers.¹ After the dust of the early years had settled, what began with dozens of potential mining companies had become concentrated and stable. As these corporations grew in profitability due to both national and international demand, so too grew their need for capital and labor. Given the rudimentary state of pebble mining technology, most of the labor was unskilled; and, among the unskilled laborers, most workers were black.² The relationship between capital and labor during this period was tense, and reached its most visible breaking point in a months-long strike in 1919.³

The phosphate industry came to prominence in Florida during the formative years that boosters and historians alike have termed the “New South,” and it did so with a large, typically black labor base and a protracted labor-capital opposition. This fits closely with wider trends in the region. The New South, as a whole, has been characterized by its foremost historians as a period of uneven industrialization and deepening racial segregation.⁴ Yet despite these

¹ Arch Blakey, *The Florida Phosphate Industry: A History of the Development and Use of a Vital Mineral* (Cambridge: Harvard University Press, 1973), xxi.

² *Ibid.*, 57.

³ Jan Voogd, *Race Riots & Resistance: The Red Summer of 1919* (New York: Peter Lang, 2008), 73-75.

⁴ C. Vann Woodward, *Origins of the New South, 1877-1913* (Baton Rouge: Louisiana State University Press, 1951) remains standard; Woodward characterized the New South as beholden to the economic interests of the Redeemers and of an ascendant capitalist class. Picking up in the year that Woodward left off is George B. Tindall’s *Emergence of the South, 1913-1945* (Baton Rouge: Louisiana State University Press, 1967), 95, 125, 184, 319, encompasses the other half of the period studied in this thesis. I find that the absence of an overarching theoretical framework gives Tindall the ability to closely narrate the conflicts of the period in greater depth than any other New South historian; his New South begins as Bryanite progressivism yields to a Wilsonian embrace of industry (“business progressivism”), as social progressivism is diffused into the Prohibition movement. Having “deeply implanted the idea of deliverance through industry,” the ‘20s simultaneously saw deepening segregation, credit shortages and

correspondences, the Florida phosphate industry is almost wholly absent from the historiography of the New South. This thesis will address the relationship between Florida's phosphate industry and these wider developments of the New South.

What the New South entails, and what phosphates' role in it was, must first be clarified. In *The New South Creed*, Paul Gaston identifies the myth of the New South as one that combined the goal of "economic modernization" (the "New") with a maintenance and reinforcement of segregated racial practices (the "South").⁵ For the early New South mythmakers this was to be a functional harmony.⁶ Gaston finds, on the contrary, that this economic development and these racial practices were far from harmonious. According to labor historian Henry McKiven, the project of the New South carried as much threat to the repressive social order of the boosters as it carried promise of harmony.⁷ Specifically, economic modernization entailed the creation of an industrial labor force. This could ferment labor activism. And the racial composition of Southern demographics posed an even greater worry to boosters.

The recurrent themes of the New South's historiography (economic modernization, urbanization, social conflict) are in many respects familiar beyond the region, and recur again and again in histories of America's struggle into modernity.⁸ Modernity as a historiographical category designates the various and contingent, though often stark and violent, historical

"chronic distress" in agriculture, culminating in the Depression. The New South experienced at once "urban booms and farm distress" and relied on, while being crippled by, its perpetually cheap labor markets.

⁵ Paul Gaston, *The New South Creed: A Study in Southern Mythmaking* (New York: Knopf, 1970), 195.

⁶ Henry McKiven, *Iron and Steel: Class, Race, and Community in Birmingham, Alabama, 1875- 1920* (Chapel Hill: The University of North Carolina Press, 1995), 1.

⁷ *Ibid.*

⁸ "Modernity" has long been a crucial historical and sociological category, associated since Max Weber with the rationalization of production, centralization of politics and industry and increasing bureaucracy. Historical and interpretive accounts of modernity important for this thesis Robert Wiebe, *The Search for Order, 1877-1920* (New York: Hill and Wang, 1966); Immanuel Wallerstein, *Historical Capitalism* (New York and London: Verso Books, 1983) and Joyce Appleby, *The Relentless Revolution: A History of Capitalism* (New York: W. W. Norton & Co., 2011).

processes of urbanization, commodification of labor, goods and services, integration into national and world markets (with concomitant nationalisms and World Wars), monopolization of capital, political centralization, racial tensions and technological change. This narrative is commonly one of “agrarian” becoming “urban,” but this simplifies the dynamic of modernity and industrial capitalism, which creates regions of “underdevelopment” in the same movement that sees tremendous growth in wealth and industry. Historian Robert Wiebe aptly characterizes the changes that took place throughout the 1890s and 1900s, finding economic centralization married to dislocation, urbanization to disruption and the imposition of law to the legal sanction of privilege.⁹ The boosters’ New South was a self-conscious attempt to reap the benefits of modernity while rhetorically downplaying its difficulties. Halting, isolated attempts at industry, and Jim Crow guaranteed that the difficulties of modernity were particularly acute in the South.

Within the historiography of the New South, there is a conspicuous scarcity of works on Florida; historian Paul Ortiz has identified a persistent trend of “Florida exceptionalism,” the image of Florida as set apart from the “racially oppressive Old South” and therefore not marked by the conflicts of its neighboring states.¹⁰ Florida’s per-capita lynching rate, the highest in the nation during this period, should dispel that myth.¹¹ And to place Florida squarely within the narrative and framework of the New South is to remove any vestiges of “exceptionalism” from its history. I argue that Florida’s phosphate industry demonstrates that Florida was not exempt from the inherently conflictual nature of modernity.

⁹ Wiebe, *Search for Order*, 27, 31, 77.

¹⁰ Paul Ortiz, “Afterward,” in Irvin D. S. Winsboro, *Old South, New South, or Down South?: Florida and the Modern Civil Rights Movement* (Morgantown: West Virginia University Press, 2009), 221.

¹¹ *Ibid.*, 224. Florida enjoyed this distinction from 1882 to 1930.

Structure and Historiography

This argument is made by examining three particular conflicts pervasive in the phosphate industry and characteristic of the New South.¹² These areas of tension are labor, technological change and political economy. The chapters will examine each of these perspectives distinctly, beginning with the local labor conflict of 1919; widening in scope to consider the intra-industry dynamics of technological change and ending with inter-industry and regional economic integration. In structuring the argument in this way, I intend to expand labor historian Brian Kelly's insistence on "bringing the employer back in," or considering the agency of labor at the local level alongside the structural constraints that become imposed upon actors at the level of capital.¹³ In skeletal outline: low wages and twelve hour shifts precipitated labor organization among the largely unskilled mine workers, an organization that cut across and negotiated the Jim Crow color line. Despite initial federal involvement, the resulting strike was only resolved grudgingly, with hours shortened and pay slightly increased. The industry was capital-intensive and during the period rarely saw high profit margins, at times mining at a loss. Mine operators were willing to halt production altogether rather than cede to labor's demands, in part because competition and overproduction had rendered higher labor costs deeply unpalatable to the industry leaders. The economic imperatives that constrained the behavior of capital were a result of regional and national market behavior, as the industry existed in a commodity chain integrated into agriculture, the fertilizer and chemical industries. The capacity of the union to organize was

¹² "Tensions" and "conflicts" can be translated into in the language of Marxist thought as essentially the question of *contradictions*: for example, the contradiction between both an ostensibly de jure free labor force (legal right to sell one's labor) and an actually de jure racial hierarchy; the contradiction between the drive for competitive production and the relative declines in profitability; the contradiction between free market imperatives and the centralization of production.

¹³ Brian Kelly, *Race, Class and Power in the Alabama Coalfields, 1908-21* (Urbana and Chicago: University of Illinois Press, 2001), 9.

also constrained by Jim Crow segregation, entrenched in law and white sentiment, and actively manipulated by the industry against the union.

Southern phosphate mining has a sparse secondary literature. The only notable monograph on Florida phosphate is Arch Blakey's 1973 institutional history, *The Florida Phosphate Industry*.¹⁴ Blakey's work is strictly narrative, avoiding questions of labor, race, or of a larger New South context. More pressing work has been done on the phosphate industry in South Carolina, explicitly connecting it to the development of the New South. The most valuable of these, a recent monograph published by New South historian Shepherd McKinley, places South Carolina's phosphate mines squarely within the context of post-bellum racial antagonisms, arguing for the significance of the early industry's role in the creation of a viable black labor force existing beyond the strictures of sharecropping.¹⁵ An earlier, far less sanguine, article published by Don Doyle and Tom Shick connected the industry's disappearance and failure with the economic and social divisions endemic in the New South. Doyle and Shick argue that the South Carolina phosphate industry experienced a "stillbirth" due to the inability of the upper class to cope with either capital-driven entrepreneurial demands or with the challenge of recruiting a sufficient amount of wage laborers.¹⁶

Given the centrality of labor in the industry's confrontations with the problems of race and economic change, the first chapter of the thesis is staged as a contribution to labor history. This chapter draws on two aspects of American labor history: the concept of "industrial

¹⁴ Blakey, *The Florida Phosphate Industry*. Given that this thesis is organized analytically rather than narratively, it presupposes the unimpeachable (if limited) narrative history given by Blakey – as such, it is recommended to consult Blakey's work for this narrative.

¹⁵ Shepherd McKinley, *Stinking Stones and Rocks of Gold: Phosphate, Fertilizer, and Industrialization in Postbellum South Carolina* (Gainesville: University Press of Florida, 2014), 8.

¹⁶ Don Doyle and Tom Shick, "The South Carolina Phosphate Boom and the Stillbirth of the New South, 1867-1920," *The South Carolina Historical Magazine* 86 (January 1985), 4. Doyle and Shick credit "Afro-American resistance to the wage labor market" for this difficulty.

democracy” and of interracial unionism, and attempts to bring these ideas into conversation. The question is whether the demand for World War I-era industrial democracy was hindered or helped by the racially egalitarian organizational stance of the industry’s WWI-era union, the International Union of Mine, Mill and Smelter Workers (known commonly as Mine-Mill).¹⁷

Interracial unionism became a prominent topic in the historiography due to an essay published by Herbert Gutman in 1968 on the letters of black labor organizer Richard L. Davis. The debate that ensued must be rehearsed. Gutman expressed the possibility of a genuine interracial spirit among in the United Mine Workers and asked that more work be done on the matter.¹⁸ Two decades later, labor historian Herbert Hill took strong issue with the essay, arguing that uncritical acceptance of the rhetoric of the union organizers will blind historians to the far more divisive racial realities underlying them and dictating union policy.¹⁹ Although their positions are more nuanced, the “Gutman-Hill debate” became shorthand for the historiographical argument regarding the very possibility of interracial unionism.

In the late 1990s and early 2000s works by Daniel Letwin, Brian Kelly and Robert Woodrum revisited the Gutman-Hill debate. Writing within a decade of each other and actively engaged in conversation, Letwin, Kelly and Woodrum provide a natural point from which discussion of Florida’s Mine-Mill policies can be broached. All three historians look to the coal mining unions of Alabama (primarily, the UMW, the object of the Gutman-Hill debate) in the first decades of the 20th century. Letwin offers support for Gutman’s hope to find class solidarity

¹⁷ Joseph McCartin, *Labor’s Great War: The Struggle for Industrial Democracy and the Origins of Modern American Labor Relations, 1912-1921* (Chapel Hill: University of North Carolina Press, 1997), 12.

¹⁸ Herbert G. Gutman, “The Negro and the United Mine Workers of America, the Career and Letters of Richard L. Davis and Something of Their Meaning: 1890-1900,” in *The Negro and the American Labor Movement*, edited by Julius Jacobson (New York: Anchor Books, 1968), 49-127.

¹⁹ Herbert Hill, “Myth-Making as Labor History: Herbert Gutman and the United Mine Workers of America,” *International Journal of Politics, Culture, and Society* 2 (Winter 1988), 133.

trumping racial division in even a limited way by examining closely the moments that miners were able to separate wage and labor-related issues from the everyday experience of racial caste, which went largely unchallenged. Kelly in part suspends the debate to consider the composition and internal conflicts among Alabama's black UMW miners. Rather than rehashing the white-black labor dichotomy, Kelly finds that among black workers themselves there was a significant division between middle class, reconciliatory, conservative black workers and a much smaller group of radical or militant workers. Woodrum, writing after Kelly, partly echoes Letwin, and draws a useful "underground-aboveground" distinction, which was particularly operative in the 1920s. This distinction allowed for practices evincing racial solidarity to be engaged in "underground," that is, in the mines, but go ignored or violated while in the segregated, Jim Crow space of the "aboveground."²⁰

The historiography of mining technology offers only blank pages on the developments of phosphate mining after 1900. From the perspective of the history of technology, the industry provides a chance to examine the relationship between technological change and the economic dynamics that provide the framework that either enables or inhibits the development of technology. This includes intra-industry competition, world-market competition and opposition between labor and capital.²¹ Robert Woodrum provides a salient example of conflict between labor and technological change: interracial labor practices in Alabama were severely undercut by the process of technological unemployment, which favored white workers for the increasingly

²⁰ Robert Woodrum, *"Everybody Was Black Down There": Race and Industrial Change in the Alabama Coalfields* (Athens: The University of Georgia Press, 2007), 11.

²¹ Immanuel Wallerstein, *World-Systems Analysis: An Introduction* (Durham: Duke University Press, 2004), 26-27. Wallerstein discusses the mechanisms of competition and monopolization and their influence on technology and profitability in detail throughout his oeuvre.

skilled division of labor.²²

The most immediately relevant subfield within the history of technology is the historiography of American mining technology. The field was most active between the mid-1980s to the mid-1990s. Three works highlighting the unique manner in which capitalist development affects or determines technological change merit notice. In *Hard Rock Epic*, Mark Wyman argues that the contingencies of capital structure, geography and labor organization resist and influence the implementation of mining technology. This argument is developed by Ronald Eller, who also places this technological change within a wider Southern economic context. Technological change is no guarantee of economic progress, and can instead bring with it underdevelopment, decreased wages and deskilling harmful to labor, if these are beneficial to capital.²³ The impact of these changes specifically on mining labor are explored by Keith Dix. Dix introduces the concept of “labor process” and workplace control, and examines strategies deployed by management to use technology specifically to undermine the workers’ ability to control the pace or magnitude of work.²⁴ These arguments bear on similar changes that occurred in phosphate mining.

The historiography relevant to the third chapter falls loosely under “political economy” and the phosphate industry’s place within the broader New South economic landscape. The industry was marked by a turn toward rapid monopolization due to recklessly competitive overproduction. Is the industry’s development typical of New South political economy, or do certain conditions render it atypical (as compared to mining and other rapidly modernizing

²² Woodrum, “Everybody...,” 55.

²³ Ronald Eller, *Miners, Millhands, Mountaineers: Industrialization of the Appalachian South* (Knoxville: University of Tennessee Press, 1982), xxvi, 119, 84-87.

²⁴ Keith Dix, *What's a Coal Miner to Do?: The Mechanization of Coal Mining* (Pittsburgh: University of Pittsburgh Press, 1989), 139.

industries)? This is answered with reference not only to the works of New South political economy, but also to works that explore more widely the institutional history of industrial growth and monopolization during this period.²⁵

The historiography of the political economy of the New South spans decades, but the most relevant works for this thesis begin with the synthesis provided in James C. Cobb's *Industrialization and Southern Society*.²⁶ Cobb sets the tone by casting the New South as economically stagnant due to its delay in sufficiently capitalizing agriculture or developing infrastructure. Cobb and the historians following him are united in their attempt to understand the uneven and delayed regional development of a modernized industrial economy in the post-bellum South. Gavin Wright, perhaps the most notable of recent New South economic historians, considers the stagnation of industrial development from the perspective of the Southern labor market, which he argues was distinctively low wage in an otherwise high wage national economy.²⁷ This was due to the available labor opportunities being overwhelmingly agricultural, which created a downward pressure on wages for all other economic sectors. When industrialization did occur, it did so in relatively isolated pockets that ultimately could not reverse the uniformly low wage of the Southern labor market. Although this low wage labor market meant that labor was cheap relative to capital, it also meant that the robust level of consumption necessary for economic growth could not take hold. In their individual and jointly authored works, economic and New South historians David Carlton and Peter Coclanis argue

²⁵ Alfred D. Chandler, *The Visible Hand: The Managerial Revolution in American Business* (Cambridge: Belknap Press), 1977 and Naomi Lameroux, *The Great Merger Movement in American Business, 1895-1904* (Cambridge: Cambridge University Press, 1988) are two of the most visible examples of this approach.

²⁶ James C. Cobb, *Industrialization and Southern Society 1877-1984* (Lexington: University Press of Kentucky, 1984), 11.

²⁷ Gavin Wright, *Old South, New South: Revolutions in the Southern Economy Since the Civil War* (New York: Basic Books, 1986), among Wright's other works on Southern economy.

that industrial development was also hampered by the region's reliance on technologies and skillsets that had to be imported.²⁸ Even if there was capital available to develop industry, it could not become self-sustaining as the knowledge and machinery was not locally available. Industrial jobs were thus typically confined to low skill, low wage work that reinforced the problems of the labor market.²⁹ Access to capital was also limited by a weak investment infrastructure.

More recently, Scott Marler's *The Merchant's Capital* reemphasizes the theme of stagnation, going so far as to argue that until the New Deal, aside from small pockets of industrial capital the New South remained fundamentally non-capitalist. Marler's argument hinges on his theoretically sophisticated epilogue that engages with and provides a bridge to works using Marxist and world-systems theory approaches to political economy.³⁰ Although I take issue Marler's characterization of the New South, I draw on similar resources in my argument, particularly on the works of economist Anwar Shaikh and historian Giovanni Arrighi; their concepts of capitalism are in many respects congruent, and share an adherence to a macroeconomic theory grounded in the imperatives of profitability and the accumulation of capital.³¹ Their insistence on the dynamic and destabilizing effects of competition are more useful in explaining industrial instability, overproduction and imbalances in supply and demand than are neoclassical approaches to economics, which presuppose equilibrium models of perfect

²⁸ David Carlton and Peter Coclanis, *The South, the Nation, and the World: Perspectives on Southern Economic Development* (Charlottesville: University of Virginia Press, 2003) , 73-98.

²⁹ Ibid.

³⁰ Scott P. Marler, *The Merchants's Capital: New Orleans and the Political Economy of the Nineteenth-Century South* (Cambridge: Cambridge University Press, 2013), 257-282. In a sense, Marler is rehearsing the career-long arguments of Eugene Genovese, who often insisted on the non-bourgeois and non-capitalist nature of the South.

³¹ Giovanni Arrighi, *The Long Twentieth Century* (New York and London: Verso Books, 1994) and Anwar Shaikh, *Capitalism: Competition, Conflict, Crises* (New York: Oxford University Press, 2016).

competition.³² Shaikh and Arrighi explain crises and conflicts as endogenous to the functioning of industrial capitalism; Shaikh does so by drawing out the consequences “real competition” and Arrighi by drawing on the theme of asymmetric development, which sees growth and underdevelopment as endogenous to the accumulation process.³³ Given the New South’s vexing appearance, with pockets of urbanization and industrialization amidst sprawling rural “backwardness,” an approach that sees both as consequences of an economic and historical process of modernization is exceedingly valuable.

The approach that Shaikh takes in understanding capitalism offers a strong conceptual corrective to histories of economics that share the presuppositions of orthodox, neoclassical models. In doing so, he joins into a heterodox tradition within economics that is more interested in instability than stability, crises than perfect functioning; this line draws back from Joseph Schumpeter and Robert Heilbroner to Marx and David Ricardo. Instead of modeling capitalism and economic behavior as guided by universal rational norms, and seeing instability and crises as aberration resulting from extra-economic causes, Shaikh insists that these “non-perfect” features are intrinsic to the functioning of capitalism, which is driven to by profitability, capital accumulation and real competition – actual firms undercutting, overproducing, monopolizing to drive competitors out and achieve monopoly prices, in historically specific situations and markets. Given a noted divorce that has occurred between narrative economic history and economic theory, and the divorce between supposedly ahistorical models of economic rationality and perfect competition and the messiness and “irrationality” of actual historical events, this

³² This theory is broadly derived from Marx’s argument regarding the centrality of profit and the falling rate of profit in *Capital*, vol. 3, trans. David Fernbach (London: Penguin, 1981). It is also developed in Moishe Postone, *Time, Labor and Social Domination: A Re-Interpretation of Marx's Critical Theory* (Cambridge: Cambridge University Press, 1996) and Guglielmo Carchedi, *The Frontiers of Political Economy* (New York and London: Verso Books, 1992).

³³ Shaikh, *Capitalism*, 259-321.

heterodox approach offers much to historians.³⁴ Moreover, the importance of understanding conflict endogenously has more far reaching historical consequences, and is seen at different scales in all of the following chapters.

Conclusion

If Robert Wiebe can be taken as the exemplary proponent of the concepts of modernity and modernization in American history, then a critique of him offered by historian Kenneth Cmiel warrants some consideration, especially since these critiques echo the theses on conflict discussed above.³⁵ Cmiel recites the modernization thesis formulated by Max Weber and considers how closely Wiebe adheres to it. Cmiel argues that despite his pessimistic tone, Wiebe is guilty of downplaying conflict (particularly economic conflict between classes, and racial conflict) and, moreover, refusing to see conflict as part of the process of modernization itself, and not as an aberration or epiphenomenon.³⁶

The task is to think of modernity not as the stable endpoint reached after the resolution of conflicts, even if this stable endpoint itself is cast in the pessimistic terms of Weber (the iron cage of rationality) or Wiebe; likewise, not to think of this progress toward rationalization or order as necessary or inevitable one, which reduces conflicts to epiphenomena. The “search for order” cannot be understood apart from the patterns of disorder intrinsic to that very search.

This thesis contributes to this task by holding fast to the idea that conflict is endogenous to the process of modernization, that modernity is defined by the instability and conflicts that

³⁴ Jeremy Adelman and Jonathan Levy, “The Fall and Rise of Economic History,” *The Chronicle of Higher Education* (Dec. 1, 2014): accessed March 7, 2016, URL: <http://chronicle.com/article/The-FallRise-of-Economic/150247/>

³⁵ Kenneth Cmiel, “Destiny and Amnesia: The Vision of Modernity in Robert Wiebe's *The Search for Order*,” *Reviews in American History*, Vol. 21, No. 2 (Jun., 1993), pp. 357.

³⁶ *Ibid.*

took place, and that the South most clearly displays this convoluted process of “amelioration on the one hand and heightened tension on the other.”³⁷ This is done by focusing on one state, Florida, and providing three linked analyses of conflict typical of modernity. Labor and race, industry and technology, integration and monopolization; each of these aspects analyzed within the industry display the conflictual logic of modernity.

³⁷ The quote is from Tindall, *Emergence of the New South*, 150 – Tindall is describing the conditions of black migrants arriving in the North during the Great Migration, but the phrase is widely applicable.

CHAPTER ONE RACE AND INDUSTRIAL DEMOCRACY

The topic of interracial unionism has occupied the historiography of American labor since its rebirth in the 1970s and 1980s. Daniel Letwin's *The Challenge of Interracial Unionism* – a seminal work of this New Labor History – narrates the United Mine Workers' attempts to organize across racial lines in Jim Crow Alabama's coal fields.¹ Letwin found that due to the racial composition of the miners, an exclusion of black laborers in the union would have amounted to certain defeat.² But Letwin also notes that if the public thought the UMW sought “social equality” between the races, it would have been equally disastrous.³ The UMW, like other interracial Southern labor unions of the period, had to find a specific means to organize across racial lines “without perishing in a frontal assault” from those who refused to see segregation effaced.⁴

The racial demographics and low-skilled work of those coal miners is strikingly mirrored in another, far more neglected mining industry: the pebble phosphate mines in Central Florida. Although demographics and a low skill threshold contributed to the Alabama UMW's successful organization in the 1920s, these factors do not necessarily entail the success of interracial unionism. From the early years of the 1900s until the middle of the First World War, Florida's phosphate miners were unable to found a lasting union or to mount large-scale demands of their employers. This changed only in the last years of the First World War, when the International Union of Mine, Mill and Smelter Workers took notice of the region. The local unions formed under the direction of Mine-Mill were able to organize and to bring demands to the National War

¹ Daniel Letwin, *The Challenge of Interracial Unionism: Alabama Coal Miners, 1878-1921* (Chapel Hill: The University of North Carolina Press, 1998).

² *Ibid.*, 130.

³ *Ibid.*

⁴ *Ibid.*

Labor Board in late 1918. In 1919, after the mining companies refused to comply with NWLB-approved demands, Mine-Mill mounted a seven month strike. The Mine-Mill Union, like the UMW, was faced with the challenge of finding a means to publicly negotiate the terms of Jim Crow while still pursuing the goals of interracial organization.

I argue that it was war-time industrial democracy that provided the framework that enabled interracial organization during Mine-Mill's 1918-1919 efforts in Florida's phosphate mines. According to labor historian Joseph McCartin, two crucial components of industrial democracy were the active mediation of the federal government in labor conflicts and the war-time language of "working class Americanism."⁵ The Florida Mine-Mill efforts exemplify this approach. Federal mediation and patriotic language allowed Mine-Mill to maintain the rigidity of the Jim Crow color line while nevertheless challenging mine operators in the interest of a common cause.

This chapter also draws on Henry McKiven Jr.'s *Iron and Steel*, which argues that class identities are always crucially mediated by constructions of race.⁶ However, the pessimistic conclusions McKiven takes from this are demonstrated to be specific to the circumstances of the iron and steel district he studied. The demographic conditions of the phosphate mines, the greater uniformity of the labor and the framework provided by industrial democracy gave a sounder basis to Mine-Mill's interracial organization. But McKiven gives a stark reminder that neither pole of interracial unionism – class or race – can be ignored.

Industrial labor organization and Jim Crow are both products of modernity that share its conflictual logic. It is easy to separate industrial organization and the modern creation of the

⁵ Joseph McCartin, *Labor's Great War: The Struggle for Industrial Democracy and the Origins of Modern American Labor Relations 1912-1921* (Chapel Hill: The University of North Carolina Press, 1998), 4-6.

⁶ Henry McKiven, *Iron and Steel: Class, Race, and Community in Birmingham, Alabama, 1875- 1920* (Chapel Hill: The University of North Carolina Press, 1995), 4.

color line into progressive and regressive elements of modernity, but the harder task is to understand this disparity together, as moments of a wider narrative.⁷ This narrative of modernity invariably includes the First World War, the global background of the labor conflict occurring in Polk County.

The chapter draws primarily from two bodies of primary sources, which reflect the two defining moments of Mine-Mill's efforts in the region. The first is the series of interviews conducted December of 1918 with the National War Labor Board in Tampa. This was the stage on which Mine-Mill sought to gain legitimacy for the union in the eyes of the government and mine operators. The latter, however, refused to concede to either the union or to the National War Labor Board. The response from Mine-Mill was a strike. The strike, which spanned seven months between April and December of 1919, is the second pivotal moment for this period.⁸ The sources for the strike come from the commentary of local and state newspapers contemporary with the event. A difficulty of this chapter stems from the fact that the union, though heavily staffed by black workers, is represented by white members of Mine-Mill. Although the very organization of the union points to the active drive and patient work on the ground by black workers, the sources give little insight into their everyday goals or tactics. The difficulty of extrapolating from the experiences and histories of other Florida labor organizations also bears stressing. For the period, Mine-Mill's interracial practice was almost completely unique. Much

⁷ That Jim Crow and the Jim Crow color line are modern creations, rather than holdovers from the early post-bellum period, is the contentious but compelling argument Woodward made in *The Strange Career of Jim Crow* (New York: Oxford University Press, 1974).

⁸ "Strike of Florida Phosphate Workers," in *Official Proceedings of the Twenty-Fourth Consecutive and Fourth Biennial Convention of the International Union of Mine, Mill and Smelter Workers* (Denver: Union of Mine, Mill and Smelter Workers, 1920), 133.

more typical were the segregated policies of craft unions such as the Florida State Federation of Labor.⁹

Industrial democracy

Joseph McCartin introduced “industrial democracy” as a category of analysis into American labor history with his book *Labor’s Great War*. McCartin looked at the activity of a number of unions during the First World War, arguing that previous labor historians had neglected the centrality of the federal government in mediating labor conflict. This mediation was enabled by the newly established federal bureau that oversaw labor conflict – what would become the National War Labor Board. McCartin’s definition of industrial democracy was deliberately expansive. This allowed him to incorporate within it a number of related phenomena while retaining the modern state and the First World War as centers of gravity. More narrowly, industrial democracy entailed the use of a rhetoric he terms “working class Americanism,” the reliance on the active mediation of the federal government and the workplace demand for a degree of regularity in labor.

“Working class Americanism,” was a political language that presented labor demands in terms that were sympathetic to the war effort and patriotic in tone. This was a response to the contentious role of labor organization during the First World War. During the war, the threat of being labeled a Bolshevik or being cast as un-American loomed large. The importance of federal mediation was most evident in those cases in which the National War Labor Board played a part. As McCartin notes, this was a reflection of the increasing regulatory power of the Wilson

⁹ Robert Cassanello, "We Are White Men and Haven't Got Black Hearts': Racialized Gender and the Labor Movement in Florida 1900-1920," in *Florida's Working-Class Past: Current Perspectives on Labor, Race and Gender from Spanish Florida to the New Immigration*, edited by Robert Cassanello and Melanie Shell-Weiss (Gainesville: University Press of Florida. 2009), 132-133.

administration, and of the growth of the federal government during the Progressive period.¹⁰ The demand for regularity in the workplace is framed in contrast to historian David Montgomery's emphasis on workplace control. McCartin finds that workplace control is not a universal standard for labor demands. In the context he examines, and particularly in low-skilled work, the demand was simply for a predictable and non-arbitrary "rule of law" in the workplace, free from the caprice of management. This tied into the idea that the workplace, if not controlled by workers, should reflect the patriotic values espoused as wartime values; America being free and fair, the workplace should follow suit.

The language of working class Americanism was steeped in the rhetoric of patriotism and pro-war nationalism. It was typically anti-German but eventually became anti-Bolshevik and anti-anarchist. This concept comes initially from labor historian Gary Gerstle, who narrates its emergence as a political language in response to the wartime Americanization efforts, the centralization of industry and the influence of mass culture.¹¹ When adopted, this political language could differ wildly in its aims: used as readily for traditionalist as for as democratic and progressive ends. It is its democratic manifestation that is most relevant here, and Gerstle charts how the concepts of democracy, liberty and rights came to be adopted as tropes used in formulating political and organizational goals.¹²

Mine-Mill's phosphate union spoke in a language that was at once democratic, patriotic and nationalistic. This manifested first in the private space of the National War Labor Board hearings, before spilling into the public sphere during the strike. There the debate was waged between supporters of the union and mining companies over which group represented American

¹⁰ McCartin, *Labor's Great War*, 4-6.

¹¹ Gary Gerstle, *Working-class Americanism: The Politics of Labor in a Textile City, 1914-1960* (Cambridge: Cambridge University Press, 1989), 8.

¹² *Ibid.*, 10.

interests. By repeatedly insisting on the pro-war, pro-American interests of the union, Mine-Mill attempted to circumvent the presentation of its organizational aims as at all subversive.

Mine-Mill's working class Americanism operated with a number of distinct rhetorical tactics. The first was used exclusively during the NWLB hearings. There union representatives emphasized that Mine-Mill successfully prevented a strike of the workers. This was used to maintain that the union had the interests of the nation first, given that phosphate had been classified as a war essential industry by the War Industries Board, and the Board forbade the striking of such industries.¹³

The order from the union officials was that that union members were to “not allow any strikes by any means” and to wait for and ultimately “abide by the decision of the War Labor Board.”¹⁴ This was then presented in the language of industrial democracy: that however deplorable working conditions may have been, strikes were forbidden by the union because the miners were to be “first patriots as long as this war lasted, and then straight union men.”¹⁵ A worker at the Charleston Mining and Manufacturing Company agreed with Mine-Mill representative Edward Crough: it was a matter of putting the workers’ “patriotism first and your trade unionism second.”¹⁶ And, when workers at the Prairie Phosphate Company attempted a three day strike, the union immediately acted to end it, stating that they must, “stay on the job as long as the country is at war.”¹⁷

¹³ Docket 688, Record Group 2, Records of the National War Labor Board, National Archives, College Park, Maryland, 58.

¹⁴ Docket 691, Record Group 2, Records of the National War Labor Board, National Archives, College Park, Maryland, 22-23.

¹⁵ Ibid.

¹⁶ Docket 688 Record Group 2, Records of the National War Labor Board, National Archives, College Park, Maryland, 28.

¹⁷ Docket 690, 691a, Record Group 2, Records of the National War Labor Board, National Archives, College Park, Maryland, 73.

Throughout the NWLB hearings, related tactics were pursued, all aimed at affirming the patriotic interests of the workers in contrast with the avaricious behavior of the mine operators.¹⁸ It was repeatedly stated to the NWLB that workers across a number of the companies accepted a wage cut in 1914 in the interest of maintaining the war effort.¹⁹ Mine operators, facing war-related shortages, cut wages by as much as 25%; interviewees stressed that this was suffered stoically by the workers, sacrificing self-interest in favor of patriotism.²⁰

Similarly the fight over the reduction of labor hours was framed in patriotic terms. The demand was to shorten hours from the standard 10 or 12 (depending on the work being done) to a consistent 8 hours of per day. Crough justified the demand for 8 hours as arising not merely from the harsh conditions of the work, but from the fact that an 8 hour day was the properly American thing to do: not only insofar as it had become the industry standard for mining throughout the country (he claimed), but more specifically because fair hours were a means of distinguishing the labor of America from its autocratic wartime enemies.²¹ Crough stated that even in Germany, a country ruled by a Kaiser, the miners were worked less harshly than in the phosphate district.²² Here Crough made the implicit connection between the autocracy of the mine operators and the autocracies in Europe into an explicit critique.²³ When the mine operators attempted bribery or intimidation of the workers, this too was likened to the policies of a Kaiser

¹⁸ As used here and throughout the thesis, “mine operators” refers to the companies owning and operating the phosphate mines – that is, capital as opposed to labor. This term was common in primary sources.

¹⁹ Docket 680 Record Group 2, Records of the National War Labor Board, National Archives, College Park, Maryland, 23.

²⁰ Docket 680 76; Docket 680 File A Record Group 2, Records of the National War Labor Board, National Archives, College Park, Maryland, 8-9.

²¹ Docket 680, 36.

²² Docket 691, 39.

²³ Docket 682, 16.

or despot.²⁴ This claim would then be taken outside of the labor hearings and into the public, where striking miners were able to present their case to the press – one of the first articles produced during the strike openly pleaded, “help us win against the autocrats of the phosphate mine.”²⁵

The low wages and the inevitable debts taken on by employees at the Palmetto Phosphate Company were disdainfully likened to conditions in Mexico, “where men are forced into such peonage.”²⁶ Palmetto’s policies are wont to bring on similar “dissension” and “war” as is found in Mexico, as they were enslaving their men, Crough argued, by virtue of the fact that they consistently underpaid them while lending out future pay to workers at steep interest rates.²⁷ Mine-Mill’s moral argument is clear. This debt placed workers in a state equivalent to feudalism, to the labor of “four or five hundred years ago;” conditions which have no place for the “most progressive people” of the United States.²⁸ Industrial democracy meant that the fruits of industrial labor should be shared with the workers; that the principles of democracy and freedom touted as patriotic for the sake of war ought to be considered equally essential for labor.

Legal intimations rather than moral exhortations were made in the hearings for the International Agricultural Company. Crough noted that the company primarily exported their phosphate to Germany prior to the war. When the war broke out, it is asserted that IAC continued their dealings without regard for possible illegality.²⁹ By connecting the IAC to illegal

²⁴ Docket 683, Record Group 2, Records of the National War Labor Board, National Archives, College Park, Maryland, 14.

²⁵ “Phosphate Men Want 8 Hours and Increases,” *The Tampa Tribune*, April 28, 1919.

²⁶ Docket 687, 42.

²⁷ *Ibid.*

²⁸ *Ibid.*

²⁹ Docket 690, 691a, 17, 33.

dealings with Germany, the aim was to undermine the legitimacy of the mine operators by associating them with America's wartime foe.

In the presentation of the 1919 strike to the public additional tactics were adopted. Foremost among them was the use of the NWLB's verdict in favor of the union as a rhetorical trope to justify the strike to the public. In doing so, the workers were also able to condemn the companies as therefore being anti-American, in that they refused to acknowledge the authority of the federal government. During the strike, controlling the discourse of patriotism became a far more difficult task, as mine operators and their sympathizers took part in claiming the mantle of Americanism for themselves. One newspaper contributor, under the pseudonym Vox Populi, openly mocked the use of patriotic discourse by labor activists in Tampa, implying that their patriotism was a phony guise for "Debsite" radicalism.³⁰

Alongside the prevalence of "working class Americanism," the most conspicuous aspect of industrial democracy was the unprecedented mediatory role that the federal government took in arbitrating labor conflict. Mine-Mill recognized early on that success would depend on the union's ability to prevent immediate action in favor of a longer term approach that would culminate in the recognition of the union's demands by the federal government. That the union's strategy relied on this appeal to the NWLB stands as strong evidence that Mine-Mill's organizing efforts would have been squelched far earlier had they not received the support of the federal government.

Negative proof of the significance of federal intervention was offered by the extent to which that mine operators resisted it. Prior to the hearings, the NWLB contacted the International Agricultural Company asking for their presence. In response, IAC stated flatly that the company

³⁰ "Vox Populi is After Debsites," *The Tampa Tribune*, May 1, 1919.

would not be present, as it “will not submit to the jurisdiction of your Board.”³¹ The response from the NWLB was equally firm – the company’s defiance would certainly “not prevent the Board’s proceeding with the case in regular order.”³²

No company management was ever present during the hearings. A single lawyer, A. C. Turner, representing all of the mine operators, was there to insist on the uniform rejection by the mine operators of the idea that they must offer themselves up to a federal hearing.³³

The role played by the NWLB during the hearings was firm, almost aggressive. This was illustrated by one of the more contentious moments during the hearings. While interviewing the Phosphate Mining Company, one of the interviewees employed at this mine was revealed to have been fired due to his attendance at the hearing.³⁴ This employee attempted numerous times to tell his superiors that he would be absent from work. The supervisors and mine operators obstinately refused to accept the validity of his absence.³⁵ The NWLB representatives were incensed. They demanded from Turner that the employee be immediately reinstated – Turner deferred responsibility on to the mine operators, who communicated that they had no knowledge of a valid reason for absence.³⁶ The exchange led again to Turner flatly asserting that the NWLB had no authority over the hiring or firing of company employees.³⁷ It was during this dispute that Crough offered the memorable challenge to company authority, “if they want hell in that district,

³¹ Docket 690, 691a, 16.

³² Ibid., 16-17.

³³ Docket 680, 5-8, 11-15.

³⁴ Docket 682 Record Group 2, Records of the National War Labor Board, National Archives, College Park, Maryland, 75.

³⁵ Docket 682, 75-89.

³⁶ Ibid.

³⁷ Ibid.

they are liable to have it amongst the men.”³⁸ In a result that ultimately trumped the company’s resistance, the employee was reinstated.³⁹

Although only a single scene, the drama resulted from the conflict of union, company and federal interests. This conflict was borne of the expanding regulatory reach and power of the Wilson administration and the large companies that this regulation was beginning to affect. These tensions were hardly reserved to the Tampa office where the NWLB hearings were conducted. As the strike broke out in late April 1919, this took the public sphere as its stage. However, two central characters were added into an already tense situation: the interests of the local governments and state government, the latter represented by the extravagant Democratic governor Sidney Catts.

The strategy adopted by the mine operators was to deny their consent that the NWLB be allowed to arbitrate the dispute. The lawyer representing the mine operators to *The Tampa Tribune* stated simply that “there is no war labor board committee in the phosphate region.”⁴⁰ By doing this, the NWLB were themselves largely powerless to act, needing the consent of both parties.⁴¹ Despite the position of the mine operators, Mine-Mill continued to utilize the authority of the NWLB to justify and communicate their position publicly.⁴²

Mine-Mill secretary V. Urquhart stood out as the most outspoken public voice for the workers.⁴³ Urquhart’s visibility came at a price. In a direct illustration of the conflict existing between the County Sherriff’s office (which was cast by Mine-Mill during the NWLB hearings

³⁸ Ibid.

³⁹ Ibid.

⁴⁰ Ibid.

⁴¹ “Phosphate Men Want 8 Hours and Increases.”

⁴² “Phosphate Strike is Now General,” *The Lakeland Star*, May 1, 1919.

⁴³ “Workers, Attention!,” *The Artisan*, August 9, 1919, “Phosphate Men Want 8 Hours and Increases,” “Phosphate Strike is Now General.”

as being complicit with the mine operators) and the workers, County Sherriff John Logan arrested Urquhart for his alleged role in the assault of a contractor hired to work at one of the mines.⁴⁴ The scene on the ground primarily saw the conflict between workers and the gunmen and deputies affiliated with the mine operators. Violence in the surrounding communities during the strike was common. In August shots were fired into the town of Mulberry by guards employed by the mine operators, killing two and injuring one – both fatalities were black residents of the town.⁴⁵

Governor Catts began to openly throw his support behind the striking miners, saying not only that “their cause is just” but going so far as to claim that if the mine operators refused to recognized their terms he would look into the possibility that he could “revoke their charters” for mining in the state.⁴⁶ Catts would continue to play a role in the conflict between the union and mine operators. Industrial democracy was not confined to the arbitration of the federal government: the intervention of the state government at the urging of a demagogic Democratic governor is hardly less illustrative. This included an effort by the governor to mobilize county guards to stop the increasingly hostile “gun play” breaking out as a result of the strike.⁴⁷ Perhaps the most contentious confrontation between the state and local governments came when Governor Catts acted to remove the Polk County Sherriff John Logan and replace him with Langford, a new sheriff – an action that would be met with overwhelming public disapproval at the local level. But Logan had long been recognized by Mine-Mill as acting openly in the

⁴⁴ Docket 690, 690a; “Contractor Victim in Phosphate Mine Fight,” *Polk County Record*, May 30, 1919.

⁴⁵ Blakey, *The Florida Phosphate Industry*, 71.

⁴⁶ “Governor Took Strong Stand for Strikers,” *The Tampa Tribune*, July 15, 1919.

⁴⁷ “Home Guards are Awaiting Orders,” *The Lakeland Star*, August 12, 1919.

interests of the mine operators – even deputizing gunmen hired by IAC in the period before the NWLB hearings.⁴⁸

Interracial unionism

The critical historiographical debate for the New Labor History was that which occurred between Gutman and Hill over the possibility of a genuine interracial solidarity in the organization of Alabama's UMW. Never resolved but only qualified and retrenched this debate has continued to reverberate into the contemporary historiography of interracial unionism. But as the debate echoes, it does so with a distinct Alabama accent. The peculiarities of Alabama's UMW are largely taken for granted, and theses regarded the possibility or impossibility of interracial unionism are extrapolated without due regard for the specificity of their subject. A slightly different picture arises when the question is taken to Florida workers of this period, not only in the phosphate fields but even in the cigar factories of Tampa, the latter providing a strikingly different manifestation of interracial unionism.⁴⁹

The interracial organization of Tampa cigar workers offers a precedent and a contrast with the interracial strategies of Mine-Mill. The similarities are relatively few. The differences derive from the fact that the work was considered skilled, and demanded the particular talents of those well trained in the craft. Moreover, the racial composition of the labor differed radically from that of the phosphate mines; most of the workers were white and Hispanic, largely Cuban. Here, the language of Jim Crow was far less applicable for the simple fact that the employers and

⁴⁸ Docket 690, 690a, 44.

⁴⁹ Robert Ingalls, *Urban Vigilantes in the New South: Tampa 1992-1936* (Knoxville: The University of Tennessee Press, 1988), 133-163. This section is particularly instructive in that it describes a strike nearly contemporary with that of the phosphate workers.

the employees represented a similar racial composition.⁵⁰ What the phosphate miners of Florida shared with the miners of Alabama rather than with the cigar workers of Tampa was that their fight was cast across the color line.

Interracial unionism turns on the distinction made between the class identity and racial identities of the workers. Once that distinction is made, those identities may be found to be ultimately insurmountable, negligible, or even beneficial for organizing in the segregated South. McKiven provides a useful and explicit discussion of this distinction. For McKiven, racial identities are the distinct social identities formed by workers “in their neighborhoods, their recreational activities, their organizations, and their politics.”⁵¹ But his argument continues, noting too that “obvious racial division may, however, obscure sharp class differences within the dominant and subordinate race.”⁵² Skilled white workers, despite the advantages they gained from their race and position, knew that white capitalists could easily replace them with black workers. To retain their economic position, they deployed the color line; this “class” interest fed into racial subordination.⁵³ Although this makes class interests primary, it does so in a way that fundamentally reverses the optimism of Gutman. Rather than provide an opportunity for solidarity, the primacy of class assured the fixity of inequality.

Similar arguments Barbara J. Fields can be used to expand on McKiven. McKiven found skilled workers using racial language and racial violence as methods of cementing the privilege some white workers derived from their skilled positions. Fields radicalizes this point, arguing that race appends economic and social dominance. Fields critiques the primacy of racial identity in understanding this conflict, arguing that because race always appends economic and social

⁵⁰ Ibid.

⁵¹ McKiven, *Iron and Steel*, 4.

⁵² Ibid.

⁵³ Ibid.

dominance, it cannot be considered apart from the historically specific patterns of dominance that it is born in. Fields argues that the danger of examining race in terms of identity is that it threatens to ignore that this identity must first be imposed. The color line is an imposition, used to give purely social inequality a seemingly natural fixity, cementing privilege (such as skilled jobs) with violence. The “color line” certainly exists; but Fields argues that viewing the color line as an effect of “race” threatens to reify the category instead of understanding race exclusively as a means of cementing social and economic dominance and conflict. She quotes W. E. B. Du Bois, that to be black is simply to be “a person who must ride 'Jim Crow' in Georgia.”⁵⁴ By which she means that racial identity is necessarily affixed to social domination or subordination, it does not explain it. This point can be extended to Florida: black workers are those that must live in the segregated houses, and work the unskilled jobs. But consideration of identity is needed, so long as this means recounting the daily reality of living with the color line, of negotiating, challenging and subverting it. This is the point that David Roediger makes, in avowed debt to Fields.⁵⁵ Roediger and Fields share an interest in the shifting deployment of the color line as a means of social domination and control. It is necessary to examine how race was used, how the color line was drawn, in order to cement, undermine or negotiate historically specific social and economic situations. The color line is persistent, but is drawn over and over.

⁵⁴ Barbara J. Fields, “Origins of the New South” and the Negro Question,” *Journal of Southern History*, Vol. 67, No. 4, (Nov., 2001), 826.

⁵⁵ As Roediger himself acknowledges. David Roediger, *The Wages of Whiteness* (New York and London: Verso Books, 1991), 6-7. It is too often ignored that Roediger accepts the Marxist critiques of racial identity, such as that offered by Fields, and in fact builds his analysis on these points – at no point does he deny that class is moored in “objective” conditions in a way that race is not. But, and this point is well taken, this does *not at all* make class more historically *important*, or more explanatory, than race. It only makes the understanding of race and racial identity dependent on its contexts in social and economic dominance.

But where, and how, it is drawn, depends fundamentally of the very specific social and economic context of black and white workers.⁵⁶

Identity or imposition, race and the color line ultimately are lived realities that are formed through the everyday actions of the workers. That race exists for workers “in their neighborhoods” is a central concern of the chapter. The remainder of this chapter investigates the question of the color line as it was seen by the union members and mine operators, as presented in the evidence of the NWLB hearings and the public reception of the strike. In doing so, it will be possible to determine whether the union organizers were able to surmount the pervasive conflict at the heart of race in the New South, organizing white and black workers across the color line and despite the long shadow cast by Jim Crow.

Living conditions along the color line

For the members of the union, the fact of the color line presented itself in tangible, daily terms. The color line as imposition was most visible in the sight of the company houses provided for black workers. In every NWLB interview, union representatives were asked questions regarding company housing, and these questions, whether they were guided by Crough or by NWLB representatives, invariably led to questions regarding the living conditions of the black workers. The living conditions of the black workers were abominable, with meager sanitation, garbage, poorly constructed houses, negligent (if not wholly nonexistent) medical care, often no schools, limited access to transportation and much else that presented a picture of disdain and

⁵⁶ As noted, for Woodrum, the color line is drawn once underground; and redrawn above ground. In the phosphate mines, it is drawn differently depending on the organizational context; depending on the presentation of the union; depending on whether workers are on or off the job. This historiographical detour is taken, because understanding the interplay of Jim Crow and Mine-Mill's interracial policies is difficult; difficult both because sources relating black experiences in the mines during this time are scarce and difficult because the language used by white union representatives during the NWLB trials is deeply ambivalent.

neglect on the part of the company officials, whose task it was to furnish and look after these houses. At every mine, there was white housing – itself miserable, although typically far less so – and then there was colored housing, separated geographically by as little as 100 yards, but socially, occupying an utterly different world.

The limits of the primary source material is felt strongly here: nearly all of the explicit descriptions of race came in terms of the living conditions of black workers, which were described by white workers with an ambivalent mixture of disgust and empathy. The empathy came in terms that depicted the interests of black workers in contradiction to those of the mine operators, although not necessarily as aligned with the interests of white workers.

Mine-Mill representative and American Cyanamid Company employee Russell put it bluntly in an early hearing, “the colored houses are rotten.”⁵⁷ At the American Cyanamid mines they were found to be submerged in water that ran over from the mining pits and from the sewage that is given no place to drain. Pools of water surrounded the houses.⁵⁸ The number of houses that could be present at a mine varied widely depending on the company. One of the smaller groups of company housing, provided by the Phosphate Mining Company in Lakeland, offered only ten white houses and six “colored” houses.⁵⁹ Here the black workers’ housing was described as being simply “shacks stuck up here and yon on the property.”⁶⁰ Meanwhile, at the Phosphate Mining Company mine in Nichols, there were as many as 45 “colored” houses provided by the company.⁶¹ The conditions here too were described as being execrable. While whites were provided for with basic sanitation and garbage disposal, among the black workers’

⁵⁷ Docket 680, 121.

⁵⁸ *Ibid.*, 124-125.

⁵⁹ Docket 681, 26.

⁶⁰ Docket 682, 40.

⁶¹ *Ibid.*, 46.

houses there was no place to dispose of trash. Garbage collected in the areas around the houses to such an extent that “you couldn’t walk.”⁶² No toilets of any sort were provided, barring the black workers themselves digging “a hole in the bank” for that use.⁶³ The houses leaked in the rain and were consistently wet; they were surrounded by pools of standing water that was partially from the mines and partially runoff from sewage.⁶⁴ This unsurprisingly had the effect that there was a constant threat and presence of illness among black workers and their families in the company houses.⁶⁵ The union member who testified for the workers at the Phosphate Mining Company, Sutherland, presented these descriptions of the black workers from a perspective that seemed initially empathetic. However, the complexities of race relations became manifest when this same worker announced that much of his knowledge of the conditions of the workers derived from the fact that he had been earlier been appointed by the deputy sheriff for the purpose of patrolling the black houses.⁶⁶ Sutherland was tasked with policing black workers at their homes for the express intent that they did not “raise the roof off the house at night.”⁶⁷ Even moments of seeming solidarity, as in the indignation over the living conditions of black workers, is complicated by the framework of Jim Crow – indignation can coexist with a superiority sense of respectability, reifying an imposed condition into a measure of character.

White union representatives were comfortable distinguishing between black workers they found to be respectable and those they did not: for example, married workers were accorded slightly more respect.⁶⁸ At Swift & Company, union member Miller did not shy away from

⁶² Ibid., 57.

⁶³ Ibid., 46.

⁶⁴ Ibid., 47.

⁶⁵ Ibid., 57.

⁶⁶ Ibid.

⁶⁷ Ibid.

⁶⁸ Docket 683, 40.

describing in terms of either bemusement or scorn that the unmarried black workers lived in a state of constant disarray, in what he referred to (without elaboration) as being a “whore-town.”⁶⁹

The presentation of the miserable living conditions forced upon black workers in the company houses was doubtlessly emphasized as one tactic in the attempt to gain the backing of the NWLB. In every interview there were two themes touched upon at length. The first was the difficult conditions of the workers on the job, particularly in their excessive hours and dangerous work. The second was the living conditions of the workers, particularly the black workers who lived at the mines. The intention of this tactic was likely to present the conditions at the mines as one of near total neglect and abuse on the part of the mine operators. In this, the presentation of these gruesome scenes was essential. In a very real sense, however, the union representatives were putting the misery of the black workers *on display*. Not only was it a matter of typically white workers speaking for black workers, but speaking of them in only the most degrading contexts. Again, that this was a tactic pursued by Mine-Mill is doubtless, and that the NWLB was interested in understanding the sanitary conditions of workers at the mines was also likely true. However, in presenting race primarily in terms of the abuses suffered by black workers, the white union representatives were able to draw the color line in a way that not only does not aim at subverting the segregated norms of the region, but also tacitly reinforced them. The sympathetic tone adopted during the portrayal of black workers' living and working conditions often contrasts sharply with the conflicts that threatened to erupt when the white hold on skilled work was threatened. This can be seen too in looking at how adept mine operators were at negotiating the ambivalence of race; knowing that the color line was not fixed, but could be manipulated as a means of undermining the unions organization.

⁶⁹ Ibid.

The poor conditions of the black workers extended far beyond the simple neglect of their housing conditions. Off-the-job they were also taken advantage of by the mine operators by means of predatory short term loans and high interest rates offered by the company stores or commissaries. It was stated explicitly by the worker Hewitt that interest on loans was used by the Phosphate Mining Company with the deliberate intent to “take advantage of the darkies.”⁷⁰ Crough noted too that black workers were “practically compelled to trade at the commissary” at the Palmetto Phosphate Company, a commissary notable not only for its high interest rates but for the fact that the mine superintendent personally owned partial stock in the commissary and, therefore, made profits off of the interest charged to workers.⁷¹ At the Prairie Pebble Phosphate mines, the company issued an aluminum currency as an advance on wages, which was accepted only at the company store and by one Mulberry vendor. Getting the aluminum scrip exchanged for dollars was exceedingly difficult, “when negroes, want cash, as a rule, or a low grade white man.”⁷² In theory, the company would buy the aluminum money back for cash, with a difference representing a loss in real value. In practice, this was not necessarily the case.⁷³

The presentation of the boundaries of the color line as it existed in the workplace rarely suggested interracial sympathies. In some cases, segregated practices were explicitly upheld by union representatives. In his interview with the NWLB, American Cyanamid Company employee Russell recounted that at the workplace there is only a single drinking cup provided by the company for mine workers. Crough asked if this drinking cup was shared between white and black workers; Russell noted that it was, but that he himself would *not* drink from such a cup.⁷⁴

⁷⁰ Docket 682, 28.

⁷¹ Docket 687, 78.

⁷² Docket 690, 691a, 87.

⁷³ *Ibid.*, 104.

⁷⁴ Docket 680, 99.

Race was also pervasive in the descriptions of the working conditions of the low-skilled miners, particularly those who worked in the pits constantly flooded by the hydraulic hoses, in the pervasively dusty and hot drying bins and in the task of laying dynamite to remove the overburden. In the case of dynamite, at the Coronet mines in Pembroke it was exclusively black workers who were chosen to do this work.⁷⁵ The danger of this work was emphasized in a later interview, which recounted a death resulting from a delayed explosion, the effect of which was to blow the eye out of the socket of the worker.⁷⁶ At the same company, and around the same time, two more black workers were killed by dynamite.⁷⁷ Similarly exhausting were the conditions in the dry bin, which were described in every interview as being deeply intolerable not only due to the fine dust which is constantly inhaled but also due to the excessive heat for those workers who shoveled the dried phosphate into the carts for shipment or storage.⁷⁸ The dry bins at the Prairie Phosphate mines were staffed solely by black workers, who worked without clothes due to the heat and with only sacks tied around their feet as protection.⁷⁹ After leaving the dry bin, sweat came off these workers like a “bucket of water.”⁸⁰ Again and again, the images of suffering black workers were presented by white union representatives; tactically, this had the positive effect of demonstrating the conditions forced on workers by mine operators, but it also served the purpose of differentiating the social standing of the black and white workers.

⁷⁵ Docket 685, 686, 63.

⁷⁶ Docket 690, 691a, 82. Named J. E. Rogers.

⁷⁷ Ibid. Names Joe Jenkins and Moses Brown.

⁷⁸ Ibid., 60.

⁷⁹ Ibid., 122.

⁸⁰ Ibid., 123.

Mine-Mill organizational strategies

The question of Mine Mill's overall organizational strategy is one that cuts across industrial democracy and interracial unionism. The union actively sought to circumvent direct and immediate action in favor of pursuing mediation from the federal government first.⁸¹ The strategy is explained by Crough, "if you had any troubles or differences between yourself and the company that you should put them in the hands of some government Board."⁸²

Ground level accounts of Mine-Mill's specifically interracial tactics are scarce. One example came during the NWLB hearing of the Charleston Mining and Manufacturing Company in Fort Meade, where a white union worker gave some insight into the organization between races, noting that white workers were organized first, but that immediately thereafter black workers were admitted into the union and organized alongside them.⁸³ The tense racial politics inspired by the union's interracial strategy recurred throughout the Charleston hearings. Interviewee Colbert explained that black workers were offered by mine operators the positions of the white workers who had been agitating for union organization, and guaranteed that in the instance that the black workers simply left the union they would be given all of the principle skilled positions, including the running of the machinery and the foreman jobs.⁸⁴ Black workers responded to this exactly as the mine operators hoped that they would not – by reporting the offer to the heads of the union.⁸⁵ Crough wasted no time in asking Colbert, "so the company is actually trying to create race disturbances in the district?"⁸⁶ The response from the interviewee was affirmative, and he noted that there would have been trouble (that is to say, racial conflict)

⁸¹ Ibid., 49.

⁸² Docket 687, 48, 49; Docket 680 File A, 11.

⁸³ Docket 688, 31.

⁸⁴ Ibid., 41.

⁸⁵ Ibid., 32.

⁸⁶ Ibid.

“if he had done it other than union men.”⁸⁷ Colbert noted too that had the replacement of white skilled positions with black workers taken place it would have not only been a matter of contention with the workers, but with “the entire community,” that the “citizens would have resented it.”⁸⁸ Hancock, another employee of Charleston, also stated that he did not believe “the citizens and the community would stand for it.”⁸⁹ Colbert began to discuss an instance at a different mine in which this occurred, “there was a case similar the other night” – but he was cut short by Crough, and never finished the thought. Even in this silence the tension that existed within the district’s workers and community as a whole is evident. While interracial organization was pursued, the advantages of skilled work remained the domain of white workers exclusively, even among union members.

The attitudes of the mine management toward organization varied; in some cases, lower level shift supervisors were members of the union. However, the attitudes toward interracial unionism, though rarely stated, are instructive in those instances in which they are. One such example was offered by a mining foreman, Mr. James, of Charleston Mining who, though sympathetic in general with the demands of the workers and offering no qualms for white organization, lamented that the union allowed black workers for the fact that “the more you pet a Negro, the sorrier he was.”⁹⁰

During the 1919 strike the interracial composition of the union was rarely made note of by the local press. Despite this, racial tensions frequently played a role in reports of the strike, as black workers were most typically presented as strikebreakers who worked either for the mine operators or were used by the operators, even against their will, as a means of disrupting the

⁸⁷ Ibid.

⁸⁸ Ibid.

⁸⁹ Ibid., 43.

⁹⁰ Docket 688, 33-34.

strike.⁹¹ One report featured a mine operator having to deny that “Negroes are kept on job by gunmen.”⁹² This report is presented more generally as a demonstration that black workers were being used successfully as strikebreakers at the Coronet and Palmetto Phosphate Company mines.⁹³

The image of black strikebreakers became a consistent theme in the public press regarding the strike. Union members were less often recognized (or vilified) for their interracial organization; instead they were portrayed as being consistently aggressive toward black strikebreakers. The first such report found that a white worker, implied to be a union member, shot a recently arrived black strikebreaker without provocation.⁹⁴ The same claim was made in a different instance only months later, when “one negro who is supposed to be one of the strike breakers recently arrived” was fatally shot by, supposedly, a white union member.⁹⁵ Mine-Mill denied these accusations, though, claiming that they represented an effort on the part of the company gunmen and sheriffs to present the union in as poor a light as possible.

Brian Kelly’s recognition that diverse class interests are not solely the domain of white workers, but exist in black communities as well is worth heeding.⁹⁶ But he also refuses to downplay that employers often used the divisive politics of the color line as a tool against workers. Both insights can also be applied to the Florida phosphate mines. Intra-racial conflict appeared to have been much less common among phosphate workers than in the black communities formed by Alabama coal miners. This is due in part to the economic composition of

⁹¹ “Knight Claims Mines Working,” *The Tampa Tribune*, June, 28, 1919.

⁹² Docket 688, 15.

⁹³ “Knight Claims Mines Working.”

⁹⁴ “White Man Arrested for Murder of Negro,” *Polk County Record*, July 25, 1919.

⁹⁵ “More Trouble in Mining District,” *Tallahassee Democrat*, August 7, 1919.

⁹⁶ Brian Kelly, *Race, Class and Power in the Alabama Coalfields, 1908-1921* (Urbana and Chicago: University of Illinois Press, 2001), 81-107.

the black phosphate workers: many of whom, being low-skill company employees who lived on-site in company housing and restricted capacity to travel, did not have much contact with a larger black community in the area. However, deliberate action was taken by mine operators to seed dissension among and between workers; utilizing the color line as a weapon against Mine-Mill.

The most significant example of the sort of intra-racial antagonism as documented by Kelly was given during the NWLB hearing for the Palmetto Phosphate Company. The mine operators offered a car for the services of a black anti-union organizer.⁹⁷ The novelty of this was that car ownership was exceptionally unusual among black workers. As Russell stated, “no Negroes have automobiles.”⁹⁸ The “colored man” was referred to only by his last name, Mayes, and the car he was given was a \$500 Ford purchased by the superintendent of the Palmetto Phosphate Company, Mansfield.⁹⁹ It was explained in the NWLB interview that Mayes drove to mining camps and workplaces to preach about the Red Cross, whom he ostensibly represented, and aimed to gain support among black workers for the purpose of building schools and shows.¹⁰⁰ One of these instances took place at a black church, and the service was attended by Mansfield and his wife, who spoke to the attendees during the service. However, Russell and Crough continued the interview to note that there was little popular sympathy among black workers for Mayes or his work – “the only ill feeling among the colored people of this district at this time is against this man.”¹⁰¹ It was further stated, by Crough – here speaking for the black miners – that they considered Mayes to be a “company tool” and no longer allowed him to come

⁹⁷ Docket 687, 62.

⁹⁸ Docket 680, 126.

⁹⁹ Docket 687, 49, 61.

¹⁰⁰ Ibid.

¹⁰¹ Ibid., 63.

into their housing area.¹⁰² A later interviewee noted that “all” of the black workers at Palmetto were members of the union, and affirmed that the intentions of Mayes was to create dissension that could lead ultimately to “race riots and trouble.”¹⁰³ In a Fort Meade Leader newspaper article excerpted in the NWLB interview, it was noted that the attendance of Mayes preaching was “a large number of white people” and “only a few of the colored people.”¹⁰⁴ This appears to verify Russell and Crough’s contention that Mayes’ efforts fell on deaf ears among black workers, all of whom were unionized.

But perhaps the most notable aspect of the interracial unionism of the Mine-Mill in Florida is how rarely it was presented either as a central aim or even as an aspect of the organizational strategy of the union. The union clearly sought to avoid being painted as a radical organization, as their frequent denials of association with the IWW attested.¹⁰⁵ It was the specific conditions of *industrial democracy* that enabled Mine-Mill to achieve the limited success that they did as an interracial organization and to do so while simultaneously avoiding the implication that they were interested in either radical political aims or in upsetting the social fabric of Jim Crow.

It is helpful to consider the arguments made by labor historian Alan Draper in his article, “The New Southern Labor History Revisited,” which engages both with the interracial unionism of Letwin and McKiven and with the interracial strategy of the Mine-Mill union of Alabama during the 1930s. In his article, Draper argues that the success of Mine-Mill depended not upon any organizational radicalism or class unity between black and white workers but, more fundamentally, on the intervention of larger organizations above union. Namely, the federal

¹⁰² Ibid., 64.

¹⁰³ Ibid., 75.

¹⁰⁴ Ibid., 86.

¹⁰⁵ Ibid., 47.

government and the corporate owners of the mining operators.¹⁰⁶ Draper's pessimism appears unwavering, citing political scientist E. E. Schattsneider's assertion, "it is the *loser* who calls for outside help."¹⁰⁷ Draper finds the 1930s Alabama Mine-Mill to be only putatively radical and even without consideration for its ideological stance, to be fundamentally overpowered by the constraining forces (corporate and government) operating above it. Draper's article is one of the few works in the secondary literature that explores the strategies of Mine-Mill and his findings appear almost hostile to the idea of interracial sentiment. This is a healthy skepticism, but it is perhaps overstated. The Alabama Mine-Mill did require government intervention on their behalf, and the company did acquiesce – but if they posed so little threat, it is unlikely that the latter would have occurred at all. Moreover, Draper comes close to contradicting his own thesis when in the same paragraph he attributes some of Birmingham Mine-Mill's organizational success to the greater reception the union had among black workers; and then, sentences later, says that it was the presence of "broader forces" and "employer strategy" that ultimately accounted for this same success.¹⁰⁸ If "local structures" were powerful enough to prevent organization, then the ability of black workers to organize likely would have amounted to no difference at all and these same local structures would have felt little need to respond to such a powerless union.¹⁰⁹

Draper provides an important context for the activities of the Florida Mine-Mill. What Draper presents as failings of the Mine-Mill – that they were reliant on the intervention of the government, that their aims were not as politically radical as some have claimed – are only inverse images of the positive picture given by McCartin's industrial democracy. If it is

¹⁰⁶ Alan Draper, "The New Southern Labor History Revisited: The Success of the Mine, Mill and Smelter Workers Union in Birmingham, 1934-1938," *The Journal of Southern History* 62 (February 1996), 87-108.

¹⁰⁷ *Ibid.*, 108.

¹⁰⁸ *Ibid.*, 107.

¹⁰⁹ *Ibid.*

recognized that Southern unions faced steep odds and opposition within and without the working community, then examining their tactics in terms of unequivocal “winners” and “losers,” or examining their interracial policies as unequivocal egalitarian or segregationist quickly becomes an untenable position. If industrial democracy is accepted as a valid category of analysis, and if Mine-Mill’s tactics adhere to those found by McCartin to be operative across the country during these years, then it is easier to understand Mine-Mill more sympathetically. Florida’s Mine-Mill did rely on the authority and mediation of the federal government and did so within a framework that expressly denied any radical or subversive political aims; these should not, though, be presented as failings, but analyzed as methods and tactics employed by the union to navigate a hostile Jim Crow South.

CHAPTER TWO TECHNOLOGICAL CHANGE AND INDUSTRIAL CONFLICT

As one wry trade journalist put it in 1921, “contrary to popular belief, the most surprising industry of Florida is not agriculture; not cigar manufacturing; not even taking money away from tourists; but mining – more particularly, the mining of phosphate rock.”¹ Not only was phosphate mining the “most surprising” industry in New South Florida, it was also one of its most industrialized and productive, annually accounting for more than 75% of the domestic production of phosphate and the majority of world production between 1900 and 1930.² This suggests the importance of the industry for an understanding of mining technology. The historiography on mining during this period is rich with studies of Alabama coal mining, with the mining of the Appalachians and the expansion of Western mining. Yet nothing has been written on the technology of Florida’s largest mining industry, one that, due to its almost exclusive reliance on surface or open-pit mining, offers potentially new understandings of the implementation of mining technology and its change.

But when examined, what is most striking about the industry during this period is how rare and relatively small the technological changes that took place were. The picture that emerges from the primary sources is one in which technology plays a subordinate role to other determinate factors. Florida’s phosphate mining industry demonstrates that technology exists only as part of a complex structure, which includes labor, productive capacity (including available capital and resources), intra-industry competition and wider market conditions. More specifically, I argue in this chapter that technological change takes place in the Florida phosphate

¹ “Florida’s Phosphate Mining Industry,” *The Earth Mover: A Monthly Magazine for Earth and Stone Movers*, February 1921, 7.

² A. Porter Haskell and Oscar Kiessling, *Technology, Employment, and Output per Man in Phosphate-rock Mining, 1880-1937*, (Philadelphia: Works Progress Administration, 1938), 1. A. N. Gray, *Phosphates and Superphosphates* (London: International Superphosphate Manufacturer’s Association, 1930), 85-271.

industry only within a framework of industry-wide competition or antagonism. This competition derives from intra-industry (or intra-capital) competition, capitalist world market conditions, antagonism between labor and capital and competition amongst laborers. Technological change here is largely determined (enabled or limited) by the conditions existing within each of those factors. As such, understanding the interplay between these factors is crucial to understanding the changes in phosphate mining technology.

In looking at the history of technology from a largely economic perspective, this chapter adopts but modifies the perspective of Joel Mokyr in *The Lever of Riches*.³ The most crucial aspect is his definition of technological change, adopted herein: “increases in the productive potential of the economy.”⁴ Mokyr places technological change at odds with the disruptive effects of capitalist industry: unemployment, mismanagement – both of which are merely poor uses of resources.⁵ But Mokyr’s stance on productive potential is perhaps overly sanguine when applied to this specific industry. As a corollary to the primary argument of this paper, I assert that technological change may not be prevented by simple misuse or poor use of resources, but can be deliberately managed away in an industry for which technological change would be economically destabilizing (a loss of profits), even when greater efficiency would be “better” for consumers.

Mokyr connects the history of technological change with that of economic growth by focusing on what he terms “Schumpeterian growth.”⁶ This is a “free lunch” provided for economic productivity by increases in technological knowledge. But this appears to

³ Joel Mokyr, *The Lever of Riches: Technological Creativity and Economic Progress*, (Oxford: Oxford University Press, 1990).

⁴ *Ibid.*, 4.

⁵ *Ibid.*

⁶ *Ibid.*, 6.

misunderstand the thrust of Joseph Schumpeter's economic theory. The point of Schumpeter's rejection of equilibrium in favor of change was not an embrace of the "free lunch" provided by technological change, but to emphasize the destabilizing effect of capitalist development; the "creative destruction" of technological change decisively does not offer free lunches, but instability and disequilibrium.⁷ That this disequilibrium is the basis of an upsurge of productivity is not meant to minimize the "destruction" half of "creative destruction," as any elimination of capital can provide such a basis for renewed growth, whether it is the "destruction" of old technology by the implementation of new technology or the destruction of productive capacity by, say, a World War. Mokyr rejects Schumpeter's attribution of widespread technological change to capitalism specifically, but in doing so misunderstands Schumpeter. The argument was not that technological before capitalism was insignificant but that technological change takes place in a fundamentally different manner when it occurs within a capitalist economic framework. And this "fundamentally different manner" is strikingly illustrated by Florida's phosphate industry.

My reading of Mokyr, then, is supplemented by insights from historian Giovanni Arrighi (deeply influenced by Schumpeter), who treats the relationship between economic and technological change less optimistically. Arrighi provides a framework for understanding the competition that occurs between capitalists within an industry and on the world market as derived from a drive toward a destabilizing accumulation of capital and which tends to result in overproduction or overaccumulation, crises that the industry must attempt to suppress.⁸ The

⁷ Joseph Schumpeter, *Capitalism, Socialism and Democracy* (London and New York: Routledge, 1994), 156. Giovanni Arrighi, *Adam Smith in Beijing: Lineages of the 21st Century* (New York and London: Verso, 2007), 40.

⁸ Giovanni Arrighi, "Towards a Theory of Capitalist Crisis." *New Left Review* I 111 (September 1978). This is the first presentation of Arrighi's thought, which was hugely expanded upon in Giovanni Arrighi, *The Long Twentieth Century: Money, Power and the Origins of Our Times* (London and New York: Verso, 1994, 2nd ed. 2010). A

definition of “capital” employed in this chapter is derived from Marx and shared by Arrighi. Capital is the economic form that commodities take when they exist as self-expanding value, or in the process of accumulating more capital. Two particularly important classes of commodities for the accumulation of capital are constant capital, such as machinery, factories, technology and variable capital, or labor. The value expands as a result of a process by which commodities become money to become commodities again (or C-M-C) and then when the money-capital generated in this processes is invested in commodities to be returned at a greater value (M-C-M’). It is the entire process that matters, not simply one moment in the process (so capital is not simply “net worth.”) Capital is a “repetitive, expansive” process that aims primarily at the accumulation of more capital.⁹ The duty of capitalists, then, is to see that capital can “self-expand,” or that more capital can be made out of the capital that already exists.¹⁰

The purpose of this chapters is not to propose a counterfactual (that phosphate should have been more productive relative to similar industries; although this can be seen), but to dispute certain categories used within the history of technology as a method for analyzing modern capitalist industries.¹¹ The temptation of historians of technology to paint a picture of technological change as a “free lunch” or as stable advances in productive capacity, independent

similar point is offered by critical theorist Moishe Postone, who provides the framework for understanding the role of the labor-capital antagonism in technological change. Moishe Postone, *Time, Labor and Social Domination: A Re-Interpretation of Marx's Critical Theory*, (Cambridge: Cambridge University Press, 1996).

⁹ Robert Heilbroner, *The Nature and Logic of Capital* (New York and London: W. W. Norton & Co., 1985), 36-37.

¹⁰ This discussion is most explicit in “Chapter Four: The General Formula for Capital” in Karl Marx, *Capital Volume I*, trans. Ben Fowkes (London: Penguin Books, 1990), 247-257. This definition of capital is in essence that of the classical school of economics (Smith, Malthus, Ricardo) although the focus in Marx is more on the process of capital’s expansion. It is shared by World System Theorists and contemporary Marxists economists alike.

¹¹ A similar surface mining operation with large productive increases was the crushed stone industry. See Harry Kantor, *Changes in Technology and Labor Requirements in the Crushed-Stone Industry*, (Washington: Works Progress Administration, 1939). However, even in industries with drastic changes in mining technique operated according to the logic of profitability. This can be seen in coal, copper and iron – the National Bureau of Economic Research’s *The Mining Industries, 1899-1939: A Study of Output, Employment, and Productivity*, (Washington: Government Printing Office, 1944) stresses that changes in technology (mechanization and productive capacity) did not necessarily correspond with increases in productivity and vice versa.

of the economic framework (and the concepts used to identify that framework), is to be avoided. The industry *was* noted for its stagnant technology – plants remained unchanged for decades. And when technological change took place, it did so to eliminate labor. Therefore, looking at the industry from the prospective of “free lunches” will yield little historical insight. A different concept seems necessary – one in which technological change is subordinate to the intrinsically conflictual dynamics of capitalist competition.

The chapter is structured analytically rather than narratively, examining first the practices and technologies of mining basically independent of their framework (in an “internalist” fashion, done for the sake of clarity), then examining the larger economic conditions of the industry in terms of productive capacity, centralization, market conditions and capital-labor relationships in order to present the underlying structural dynamics that acted on the practices described. This section further attempts to explain the relations between the technological and economic aspects in terms derived from Arrighi and heterodox economics.

Mining technology and practice

As suggested by Mokyr’s definition of technological change, the importance of technology for an industry such as phosphate mining is essentially how much that technology is able to increase productive capacity. The different technologies employed by the industry will be detailed and examined in light of their potential effects on efficiency and productivity. Although this section narrates changes internal to the technical process of mining, it does so with an intention ultimately to invert or ironize this internality. Far from being an autonomous process, each change will be shown to rely on processes of capital accumulation and its crises. Detailing

these processes at length is also warranted by the fact that this has not been done at all in the meager secondary literature on the phosphate industry.¹²

“Phosphate mining” is shorthand for a process that involved a number of different practices and technologies. The mining of phosphate during this period occurred in four distinct steps; although there was some overlap between the steps in technology and methods, it is useful to keep them conceptually separated. Although these practices were separate, they occurred in close proximity to each other, and were jointly considered to have constituted “phosphate mining” within the industry, and laborers who worked in one area of the operation could and did often switch to others.

Stated briefly, the four practices that comprised mining were: the removal of overburden (the soil above the phosphate), the mining of the matrix (the layer containing phosphate), the washing of the matrix to extract the phosphate rock and the drying of that phosphate rock for storage or shipment. Each of these techniques could develop separately, with changes in one technique rarely necessitating the change of another. Moreover, the utilization of these practices differed depending on the type of phosphate mined. There are three in Florida: hard rock phosphates, land pebble phosphates and river pebble phosphates.¹³ Although river pebble was discovered first, and hard rock remained viable for many years, it was land pebble phosphate that was the central resource utilized by the industry in Florida. These land pebble rocks were found primarily in Central Florida, in Polk, Hillsborough and DeSoto counties.¹⁴ Land pebble phosphate itself consisted of whitish pebbles that can range in size from small grains to pieces as

¹² Arch Blakey, *The Florida Phosphate Industry: A History of the Development and Use of a Vital Mineral* (Cambridge: Harvard University Press, 1973).

¹³ Lucius Brown, “The Phosphate Deposits of the Southern States,” *Transactions of the Engineering Association of the South* 25 (1904), 63.

¹⁴ *Ibid.*, 75.

large as an inch, and are embedded in a matrix of sand and clay.¹⁵ The predominance of land pebble mining will be reflected in the discussion of technology, which will discuss hard rock and river pebble phosphate mining methods only insofar as the contrast or comparison will prove illuminating for the practice of land pebble phosphate mining.

“Overburden” referred to the layer of earth that lays on top of the phosphate that is buried beneath the surface. It was typically made of sand and clay, and often was found as three sedimented layers of fine sands and soils at the surface, a thicker layer of hard black clay and deposits of sand and clay.¹⁶ The depth of the overburden capable of being mined in this period initially ranged from four to twenty five feet.¹⁷ By 1920, overburden of 35 feet was found and capable of being removed.¹⁸

Before 1900, particularly in the hard rock fields, the method of removing overburden was performed by hand, using picks, shovels and wheelbarrows.¹⁹ In 1903, a trade journal described the method of overburden removal as scraping performed by the labor of “negroes and mules.”²⁰ It was nowhere explicitly mentioned, but likely, that the reliance of the industry in its early years on convict laborers, who offered a stable source of labor required by law to perform tasks that free labor likely would have refused to, enabled this method of overburden removal.²¹ This method persisted for longer in the mining of hard rock than it did in land pebble, and by 1906 a combination of hydraulics and steam shovels had become the industry standard for land pebble

¹⁵ John Allan Barr, “Florida Phosphate Practice,” *Colliery Engineer* 33, December 1912, 265.

¹⁶ Victor J. Milkowski, “Hydraulic Methods in the Florida Phosphate Fields,” *Rock Products*, January 31, 1920, 17.

¹⁷ C. A. Stone, “Mining and Milling Florida Phosphates,” *Engineering and Mining Journal*, March 6, 1909, 490.

¹⁸ Milkowski, “Hydraulic Methods,” 17.

¹⁹ Haskell and Kiessling, “*Technology, Employment, and Output per Man*” 12.

²⁰ “A New Plant,” *The American Fertilizer* 18-19, February 1903, 26.

²¹ Edward Parker, “Phosphate Rock,” *Mineral Resources of the United States Calendar Year 1900* (Washington: Government Printing Office, 1901), 807.

overburden removal.²² In the hard rock industry, even when steam shovels were available, the wide use of picks and shovels persisted until as late as 1915, and possibly later.²³

Given that the hydraulic method used for overburden removal was basically identical to that used to mine the rock matrix, this section will focus on steam shovel usage, which predated and continued alongside hydraulic methods as late as 1919. This were the first mechanical technology introduced to assist in overburden removal. Steam shovels would lift the overburden out of the ground and place it into cars on temporary or permanently laid tracks of rail, which would take it to waste dumps.²⁴ Accompanying steam shovels would be trams, tracks and engines.²⁵ In the first decade of mining, the character of the overburden deposit dictated the choice between steam shovels or hydraulic methods.²⁶ Looser clays or sands were removed easily by hydraulic methods, while harder clays or “conglomerates” which were unbreakable for the hydraulic hoses were dealt with by steam shovels.²⁷ Describing a steam shovel used in overburden removal in a 1912 trade journal, John Allan Barr found that they were laid upon movable tracks, with a boom of 35 feet, which carried a shovel or dipper of one to two-and-a-half yards.²⁸

By the middle of the 1910s, when steam shovels were becoming less common for overburden removal, the method of dealing with thick or difficult deposits of overburden was dynamite of typically 60 percent nitroglycerin, buried at up to 20 sticks per time into the overburden, which after detonated, loosened the materials enough that they could be removed by

²² “Phosphates and Potash Salts,” *The American Fertilizer* 24-25, January 1906, 6.

²³ George Matson, *The Phosphate Deposits of Florida* (Washington, D.C.: United States Geological Survey 1915), 90

²⁴ Stone, “Mining and Milling,” 490.

²⁵ Brown, “The Phosphate Deposits,” 80.

²⁶ H.E. Memminger, “The Florida Land Pebble,” *The American Fertilizer*, September 1905, 8.

²⁷ *Ibid.*

²⁸ Barr, “Florida Phosphate Practice,” 265.

water.²⁹ The wide use of dynamite in the industry during the late 1910s was one of the principal areas of contention among workers. Recall the dynamite-related fatalities or injuries documented during the NWLB interviews, including the worker whose eye was blown out of its socket after failing to evacuate quickly enough.³⁰

By 1913, hydraulic methods had become the preferred methods used for removing the overburden of pebble phosphate.³¹ By 1919 steam shovels were rarely used for anything but assisting in the hydraulic method (such as digging dams or temporary canals for the water).³² But by the 1930s, the hydraulic method was being wholly replaced by “dry-mining,” or the use of large electric draglines, which both removed the overburden and mined the rock.³³ Although electric draglines had been present on phosphate plants since at least 1919, the change in methods took hold in the 1920s, and had become the predominant, though by no means exclusive, method of overburden removal by 1924.³⁴ The draglines that were used in 1925 weighed 320 tons with a boom of 150 feet and a bucket of 6 yards – a considerable increase compared to the 35 foot steam shovels booms of only 15 years prior.³⁵ These draglines were powered electrically or by oil-fired steam.³⁶ By 1929 the booms were commonly as high as 165 feet and the buckets of 8 cubic yards. The material that was cut by the draglines was commonly

²⁹ Docket 680, Record Group 2, Records of the National War Labor Board, National Archives, College Park, Maryland.

³⁰ Docket 690 and 691a, Record Group 2, Records of the National War Labor Board, National Archives, College Park, Maryland.

³¹ C. B. Pentecost, “Hydraulic Mining of Phosphate Rock,” *General Electric Review* 1913, 529.

³² Docket 680, National War Labor Board.

³³ Richard M. Collins, “The Mining and Preparation of Florida Land Pebble Phosphate,” *Proceedings of the Fertiliser Society* 9 (April 1950), 8.

³⁴ F. E. Cash, *Land Pebble Phosphate Mining in Florida* (Washington: Bureau of Mines, 1924), 8.

³⁵ W. M. Weigel and B. H. Stoddard, “Phosphate Rock,” *Mineral Resources of the United States Calendar Year 1925* (Washington: Government Printing Office, 1926), 156.

³⁶ Bertrand L. Johnson, *Phosphate Rock* (Washington D.C.: Bureau of Mines, 1930), 14.

emptied into a previously mined pit.³⁷ The question, then, is this: what accounts for the change? If electric draglines had been present, and successfully used in other open-pit industries such as gravel mining by 1922, why did their implementation take place when it did?³⁸ The contemporary sources simply note the change, and hazard no explanation for its cause. It seems exceedingly likely that the adoption of draglines was not due to a greater overall productivity, as hydraulic overburden removal was remarkably efficient: rather, their adoption was due to their being a labor saving device. Which is to say, the adoption of draglines over hydraulics in overburden removal was likely due to increasing antagonism in the early and mid-1920s between capital and labor, the former diligently cutting any positions which it could of the latter to avoid rising labor costs or the possibilities of renewed striking, as the industry had seen in 1919.

After the overburden was removed, the next step was to mine the rock matrix. The phosphate matrix is a soft and basically homogeneous mixture of sand and gravel.³⁹ Before 1900 and for the first few years of the decade, the mining of land pebble phosphates was exceedingly rudimentary: pick and shovel. The hydraulic method was introduced by W. F. Lay and its superiority to other methods was already noted in 1900, “undoubtedly the only practical method of mining this rock.”⁴⁰ As such, the mining of the pebble rock matrix was intractably tied to the development of hydraulic methods of open pit mining – for the period examined, phosphate mining was nearly synonymous with hydraulic mining. By 1906, the fact that hydraulic mining was considerably more “economical of labor” than the use of steam shovels or hand mining was

³⁷ Ibid.

³⁸ “Adapting Coal Washing Principles to a Sand and Gravel Plant,” *Rock Products* 25, March 11, 1922, 19.

³⁹ Milkowski, “Hydraulic Methods,” 17.

⁴⁰ C. G. Memminger, “Progress in the Phosphate Industry during the Year 1900,” *The Mineral Industry: Its Statistics, Technology and Trade*, 1901, 515.

recognized and reflected by its industry-wide adoption and dominance for the following three decades.⁴¹

Illustrative of the typical technology of the industry, the hydraulic gun used by the Pierce Phosphate Plant in 1909 used a 2 ½ inch stream fired from their hydraulic giant (the industry term for the hose) directly onto the matrix, under pressures of 100 to 125 pounds per square inch.⁴² This was a small increase in pressure capacity over what was available in 1900, the giants of which could not exceed 110 pounds.⁴³ At this plant, after the matrix was washed into the sump hole, the two 10 inch centrifugal gravel pumps took the matrix a distance of 80 feet to the washing station.⁴⁴ The pumps were arranged such that the first, which was nearer the sump hole and stationed at a bend in the hydraulic pipe, fed directly into the second, which was located near the washing station.⁴⁵ These 10 inch centrifugal pumps were the standard technology used by the industry in 1910, and equivalents of increasingly efficient pumping capabilities would continue to be used through the 1910s and 1920s.⁴⁶

The giants required skillful manipulation and aim in order to operate successfully. Mendenhall, a trade journalist on mining, ultimately threw his hands up at the task of a complete description of the practice, deeming it “impossible to describe.”⁴⁷ This is because the streams of water did not merely remove the matrix but guided it by improvising the placement of small temporary ditches dug out by the pressure of the hydraulic giant.⁴⁸ These ditches collected and directed the matrix toward the canals and ultimately toward the sump hole. If any of the typical

⁴¹ “Phosphates and Potash Salts,” 6.

⁴² Stone, “Mining and Milling,” 490.

⁴³ Memminger, “Progress... 1900,” 515.

⁴⁴ Stone, “Mining and Milling,” 490.

⁴⁵ *Ibid.*

⁴⁶ *Ibid.*

⁴⁷ H. D. Mendenhall, “Modern Land Pebble Phosphate Mining Plants in Florida,” *Engineering News* 60, October 15 1908, 412.

⁴⁸ *Ibid.*

pit labor could be described as skilled labor, it was operating a hydraulic giant. By 1912 the reported pressure capacity of the hydraulic giants had increased to 150 pounds-per-square inch, although little else in the technology had changed.⁴⁹ In the intervening decade, the pressure used in matrix mining from the giants remained basically consistent, and 125 pounds per square inch was still a reasonable amount for 1920.⁵⁰

Given the reliance of hydraulic mining on water, providing and maintaining consistent sources of water was an obvious concern for the industry. The source of the water for the Coronet plant in Pebroke, and presumably for plants near enough to make it feasible, was the Peace River.⁵¹ Otherwise, wells were dug, as water was typically found as near as 18 to 24 feet to the surface.⁵² The problem was rarely finding water; it is more typically keeping water out of the pits, as attested to repeatedly by laborers in the National War Labor Board interviews. One such laborer described how every Monday the pits would have to be pumped out to a state in which they could be worked again.⁵³ The description in a 1920 trade journal was consistent with this, the pumps being similar electric centrifugal pumps as those used to transport the matrix.⁵⁴ The means of creating the pressure from the water source necessary for the hydraulic giants was by decreasing the size of the pipe leading to the nozzle from the pumping station: at the latter, it begins at fourteen inches in diameter.⁵⁵ The galvanized pipe used for the giants were supplemented with ball-and-socket joints to facilitate their movement.⁵⁶ When the mining took

⁴⁹ P. Jumeau, "A Modern Phosphate Plant," *The American Fertilizer* 37, July 13 1912, 44.

⁵⁰ "Mining Pebble Phosphate in Florida," *Pit & Quarry* 5, October 1920, 68.

⁵¹ Jumeau, "A Modern Phosphate Plant," 44.

⁵² "Mining Pebble Phosphate in Florida," 68.

⁵³ Docket 688, Record Group 2, Records of the National War Labor Board, National Archives. College Park, Maryland.

⁵⁴ "Mining Pebble Phosphate in Florida," 68.

⁵⁵ Jumeau, "A Modern Phosphate Plant," 44.

⁵⁶ Barr, "Florida Phosphate Practice," 266.

place too far from the location of the sump, the giants were used to blast new ones into the ground, typically 50 to 75 feet from the area being worked.⁵⁷

After mining the rock it was pumped to the top of the washing station, where the next stage in the process began. Briefly, it consisted in working the matrix so as to separate the pebble from the sand and clay, which contained no phosphate. Although for the three decades examined no major changes in the practice occurred, washing the rock was the process for which the most incremental and seemingly minor changes could amount to the largest differences. The addition of one or two extra sifting screens could drastically increase the amount of phosphate separated. Likewise, inattention to the potentially salvageable parts of the matrix could lead to large losses.

The importance of good washing technique was stressed in nearly every Annual Report issued by the Florida State Geological Survey. In 1907, state geologist E. H. Sellards lamented the tremendous waste of salvageable phosphate materials from the matrix due to the mining operating “as economically as present conditions allow” – which is to say, they had to operate somewhat sloppily, and lose fine phosphate materials, simply in order to meet the intra-industry competitive levels.⁵⁸ In 1908 Sellards asserted that fully one-half of the phosphatic material in the matrix is lost during the washing process and goes into the waste dumps.⁵⁹

Writing in 1905, the process described by trade journalist H. E. Memminger was echoed in nearly every subsequent description of washing. The practice was simple: the wet matrix was discharged onto a separator, which is a rotary screen with 1 ½ inch perforations.⁶⁰ After this was separated out the larger chunks of clay, the materials fell onto an inclined mesh screen which

⁵⁷ Ibid.

⁵⁸ E. H. Sellards, “Annual Report – Mineral Industries,” *First Annual Report of the Florida State Geological Survey*, (Tallahassee: Capital Publishing Co., 1907), 30.

⁵⁹ E. H. Sellards, “Mineral Industries,” *Second Annual Report of the Florida State Geological Survey*, (Tallahassee: Capital Publishing Co., 1908), 240.

⁶⁰ H. E. Memminger, “Florida Land Pebble,” 8.

leads to a set of log washers. This washed the rock, and it fell then into a series of increasingly fine screens, pushed on by clean water. This basic set up of separator, log washer and screens would remain the standard for the period, although there was tremendous variation in the specific layout that each plant would employ.⁶¹ A typical separator in 1908 was 18 feet long by 6 feet wide; the “logs” were 8 in by 18 feet cast iron pipes with blades bolted to their exterior, which were rotated by a series of gears.⁶² These logs were set into an inclined wooden box full of water, and the movement of the blades was sufficient to remove the unwanted materials from the phosphate. The variation, to give one example (the Medulla Phosphate Co. plant in 1908) came in that, after passing through the separator, log washer and screens, the materials passed again into another log washer, followed by another set of screens.⁶³

Sellards, as incensed as was typical for him at the loss of materials during the washing process, was pleased to find that it had improved substantially by the introduction of more steps and finer screens by 1912.⁶⁴ One addition Sellards also reported was the implementation of a crusher in the log washer: this was used in plants that excluded the initial separator stage in favor of a less discriminating screen; the crusher reduced the size of the materials while the phosphate was being washed and in doing so, the salvageable materials that may have been in the larger pieces that the separator would have excluded are saved.⁶⁵

In 1925, the design of the basic washing facility was still essentially the same.⁶⁶

However, the Florida Geological Survey’s report for this year pointed out something that would

⁶¹ Mendenhall, “Modern Land Pebble,” 413.

⁶² Ibid.

⁶³ Ibid.

⁶⁴ “Mineral Industries and Resources of Florida,” *Sixth Annual Report of the Florida State Geological Survey*, (Tallahassee: Capital Publishing Co., 1913), 83.

⁶⁵ Ibid.

⁶⁶ Weigel and Stoddard, “Phosphate Rock,” 158.

become central for the industry: the interest of companies in methods *outside* of the traditional washing process to recover phosphate.⁶⁷ One such method was volatilizing the phosphate by heat or electricity. Every year in the late 1920s brought notice to the importance of the fine materials that had previously been filtered out by screens but were becoming recognized as possessing an amount of phosphate worth recovering. The most significant advance in the washing process occurred just outside of the scope of this chapter: the introduction of hydraulic classification and chemical flotation. Of the two, flotation would be the more significant, and remained an essential element of the industry for decades thereafter. Given that it falls just outside of both the period examined (1930 was when it began to be adopted) and outside of the mining pits itself, it will not be described at length. But simply, chemical flotation consisted in placing the matrix in a fluid with chemical reagents which stripped the phosphatic materials from the waste and achieved recovery rates far beyond anything that simple washing was capable of doing.

After being washed, the next and final stage in the process of rock mining was drying. The predominant method for drying the washed phosphate was introduced in the 1890s – the use of rotary driers.⁶⁸ These rotary driers were made of iron and were placed with one end at a brick furnace and the other end open to allow the feeding of the rock. The phosphate was then driven toward the flames of the furnace, which heated the length of the cylinder, but dropped out onto a screen before reaching the fire.⁶⁹ Although this method remained consistent, the size and capacity of the iron rotary driers increased over time. A standard length in the first years of the 1900s was 12 to 25 feet, with a 30 in diameter, and was fueled by a wood fire.⁷⁰ By 1910 the rotary driers had increased to 30 feet and the furnace fueled by oil, and the following decade saw

⁶⁷ Ibid.

⁶⁸ Haskell and Kiessling, *Technology, Employment and Output-per-man*, 35.

⁶⁹ Ibid.

⁷⁰ Ibid., 36.

the diameters increase to 50 inches.⁷¹ Writing in 1907, and providing a more detailed description, engineer Granberby Jackson noted that the rotary driers were rotated atop trunnion wheels at 15 rpm.⁷² More significantly, Jackson notes the adoption of mechanical methods for feeding the furnace, which had been an exceedingly dangerous job previously.⁷³

The most notable change in the drying process was the movement of the rock after it had already been dried. This was, along with wet conditions and dynamite, the most frequently cited concern of the miners.⁷⁴ After the rock had been dried it was lifted by a conveyor belt above the dry bins where it could be stored or transported; the practice of getting the rock into the bins was, until mechanization occurred after the early 1920s, the work of laborers with shovels.⁷⁵ The men, clothed with sacks around their feet to prevent the rock from burning through their shoes too quickly, which it often would, were subjected to a persistent level of dust which was, by all accounts, unbearable after more than only a few hours.⁷⁶ It is likely that the mechanization of this process was undertaken due to it being one of the principal points of contention in the conflict between labor and capital, over the harshness of the labor. Rather than making the work more bearable, the unskilled jobs were simply eliminated from the payroll, and the workers who held those jobs along with it. A drying facility in 1924 was already largely empty of human presence.⁷⁷

The changes in mining technology during the period of 1900 to 1930 were minimal. The industry existed in something of a stasis for nearly 30 years, reaching a capacity of production in

⁷¹ Ibid., 37.

⁷² Granberby Jackson, "Mechanical Drying of Phosphate Rock," *Proceedings of the Engineering Association of the South* 18, 1907, 104.

⁷³ Ibid.

⁷⁴ Ibid., 106.

⁷⁵ Mentioned in every single interview with the National War Labor Board in 1918.

⁷⁶ Docket 690 and 691a, National War Labor Board.

⁷⁷ Cash, *Land Pebble Phosphate Mining in Florida*, 21-22.

1909 that remained consistent for the remainder of the period. Aside from an early transition from steam shovels to hydraulic methods in the removal of overburden, a plant in 1905 and a plant in 1920, or even 1925, looked in most respects identical. If technological change is, as Mokyr defined it, productive potential, then it is the absence of such change that stands out most for Florida's phosphate industry in this period.⁷⁸ What, then, are the economic conditions that accompanied the adoption or pursuit of greater productive potential?

Economic conditions, competition and antagonism

Perhaps the most fundamental aspect for understanding the economic side of the industry's technological change is that of productive capacity – Mokyr's productive potential. But considering productive potential as a single category threatens to undermine the specificity of both the industry's productivity and the nature of capitalist mining production. As Department of Labor economists Haskell and Kiessling lucidly explained, productive potential must be understood in two senses, which are related but often opposed: first, the large-scale productive capacity of a plant or of the industry as a whole and second, the small scale efficiency of production offered by each laborer given that laborer's technology and methods.⁷⁹ Haskell and Kiessling called the latter "output-per-man" and it corresponds to any and all "labor saving technology."⁸⁰ Most of the technological changes detailed above are of the latter character, while the economic concentration and conglomeration detailed below are of the former. The effect of increasing output-per-man productivity without a corresponding increase in large scale productive potential is quite simply unemployment. Considered from the perspective of labor,

⁷⁸ Mokyr, *The Lever of Riches*, 4.

⁷⁹ Haskell and Kiessling, *Technology, Employment and Output-per-man*, 2.

⁸⁰ Ibid.

labor saving technology can theoretically be beneficial, but is far more often an effort by capital to reduce on the whole the labor necessary, and results not in better work but in no work at all. This is the endgame of the battle over “labor process” that is detailed most explicitly in the historiography of mining technology in historian of technology Keith Dix’s *What’s a Coal Miner to Do?* Dix’s titular question was raised in response to corporate efforts to replace hand loading by mechanized loaders – just as dry phosphate loading was replaced by mechanical means.⁸¹

The contradiction at the heart of productive potential is this: if mining labor becomes more efficient without a corresponding increase in productive capacity, it leads to unemployment; but if productive capacity increases without corresponding labor efficiency, it becomes unfeasible to operate at that expanded level profitably.⁸²

The importance of large scale productive capacity was widely noted in annual governmental reports and trade journals.⁸³ What is most interesting about the large scale productive capacity is how quickly companies allowed it to level out at a consistent standard. A plant built in 1913 by the Lakeland Phosphate Co. possessed the capability of mining 100,000 tons of phosphate annually.⁸⁴ By 1923 this was still the most common size of plant to be built, with construction requiring a \$500,000 capital investment.⁸⁵ Barriers to large scale productive capacity would include increasing costs of production due either to labor costs or the costs of labor-saving technological capital or an increasing difficulty of mining (such as if all of the

⁸¹ Keith Dix, *What's a Coal Miner to Do?: The Mechanization of Coal Mining* (Pittsburgh: University of Pittsburgh Press, 1989), viii-x.

⁸² It is likely that labor costs would increase, for one.

⁸³ Industry leaders, high level employees of the mine operators such as C.G. Memminger or P. Jumeau regularly contributed.

⁸⁴ “New Mine and Metallurgical Construction,” *Engineering and Mining Journal* 96, November 22, 1913, 968.

⁸⁵ G. R. Mansfield, “Phosphate Rock,” *Mineral Resources of the United States Calendar Year 1923* (Washington: Government Printing Office, 1924), 288.

surface-level matrix had been mined and overburden became deeper).⁸⁶ While the latter was an ostensible concern for the industry, it did not prove to be a real barrier to productive capacity. In fact, any barrier that existed in terms of annual production was the result not of material limitations, but primarily were imposed externally by market conditions or were self-imposed by operating below full capacity. As a result of these distortions, measuring the raw productive potential of the industry is difficult. There are reliable annual numbers for the amount of phosphate that was actually produced, but the industry operated so far below capacity for most of its existence that these illustrate very little in this regard. The production numbers in 1913, for example, were practically equivalent to those of any good subsequent year and far better than most years.⁸⁷ During the war, certainly, the industry operated far below capacity; it also did in 1910 due to overproduction in the previous year and in 1919 due to the nearly year-long strike of the workers.⁸⁸ The causes of the decline in prices after the rapidly expanded production (operating at or near capacity) in 1909 was well recognized by contemporary observers; F. B. van Horn wrote that “this falling off of was probably due in part to overproduction.”⁸⁹ The importance of this concept, “overproduction,” cannot be too highly stressed. In 1911 C. G. Memminger noted that increasing efficiency was largely a moot question given the already attained levels of production the plants were capable of, yet unable to achieve due to market conditions.⁹⁰

It was recognized very early that the greatest threat to profits and to the sustainability of the industry as a whole came not from outside, but from inside. This blight, reported on in

⁸⁶ C. G. Memminger, “Florida Phosphate in 1910,” *Engineering and Mining Journal* 91, February 4, 1911, 264.

⁸⁷ Haskell and Kiessling, *Technology, Employment and Output-per-man*, 107.

⁸⁸ “Phosphate Production Curtailed,” *Engineering and Mining Journal* 104, November 17, 1917, 877.

⁸⁹ F. B. van Horn, “Phosphate Rock,” *Mineral Resources of the United States Calendar Year 1909* (Washington: Government Printing Office, 1910), 655.

⁹⁰ C. G. Memminger, “Florida Phosphate in 1910,” 264.

publication after publication, was the tendency toward competition. The economic dynamics underlying the industry cannot be better stated than was done by C. G. Memminger in 1904: “some one’s neck must be broken.”⁹¹ He attributed the instability of the industry to the widespread lack of “cooperation” among the larger corporations, and with each trying to outcompete the other for a larger market share, the result was that prices dropped to levels so low it became difficult, if not impossible, to maintain profitability.⁹² The motif quickly became familiar. In 1911, the low prices still plaguing the industry were due to “unnecessary and unfortunate competition” and just as surely as issues of *Engineering and Mining Journal* or *The American Fertilizer* brought reports of over-competition, low prices and consolidations, they also brought the reassurance that in terms of mining methods, there were essentially “no changes.”⁹³

The methods that the industry used to address this excessive competition were monopolization, conglomeration and consolidation – either buying out the competition or driving them to bankruptcy until cooperation could be achieved between the remaining large firms, who share an interest in maintaining a “uniform price.”⁹⁴ This was called for as early as 1902, the idea being that the “speculative element,” which resulted from a large number of competing companies would be stifled – which, in industry terms, if not the consumer’s, is good.⁹⁵ And this is precisely what happened. By the middle of the first decade, the industry was known for its “Big Five” – the largest scale producers who began to assert a de facto monopoly on the industry.⁹⁶ The intense, rapid pace of this wave of bankruptcy and buyouts can be demonstrated

⁹¹ C. G. Memminger, “The Florida Phosphate Industry,” *The American Fertilizer* 20-21, June 1904, 7. Italics added.

⁹² Ibid.

⁹³ Memminger, “Florida Phosphate in 1910,” 264.

⁹⁴ Joseph Struthers, “Phosphate Rock,” *Mineral Resources of the United States Calendar Year 1902* (Washington: Government Printing Office, 1903), 915.

⁹⁵ Ibid.

⁹⁶ “Florida Phosphate Region,” *The American Fertilizer* 18-19, February 1903, 20. The article only explicitly mentions Dutton Phosphate Co. However, other sources (including the FTC) designate not a Big Five, but a Big Six.

just by looking at the numbers of phosphate mining companies operating in Central Florida: in 1891, 215; in 1894, 53 and by the first decade of the 1900s, only a dozen or so were economically feasible in the pebble district.⁹⁷ But even during this period, the allure of underselling for quick profits brought on competition between the largest operators.⁹⁸ In 1910 the competition that existed, and which resulted in “unprecedented depression” for the industry, was still attributed to overproduction and competitive price cutting, openly described as “struggle.”⁹⁹ As such, the competition of the first half of the period would eventually be replaced by cartelization in the second half, when threats from outside the local industry became more prevalent and large producers took advantage of war-time conditions (specifically, the Webb-Pomerene Act) to meet those threats.

Thus, in the terms used and defined by Giovanni Arrighi, the industry as a whole faced two fundamental threats with regard to its profitability and stability: overproduction and overaccumulation.¹⁰⁰ The former describes a condition of excessive competition, which has the effect of producing an excess in goods, with a corresponding decrease in value (prices, thus profits). The year of 1909 is one such example, and this was the principle form that crises in the industry took in the period before 1920. Overaccumulation is shorthand for the

⁹⁷ Camp Vaughan Jr., “The Phosphate Industry in Florida: A Statistical Study, 1888-1946,” (PhD diss., University of North Carolina, 1950), 64.

⁹⁸ “Florida Phosphate Region,” 20.

⁹⁹ C. G. Memminger, “Developments in the Florida Phosphate Industry,” *Engineering and Mining Journal* 89, 1910, 184.

¹⁰⁰ Giovanni Arrighi, “Towards a Theory of Capitalist Crisis” is the most succinct statement of his thesis on overproduction. Overaccumulation is treated in his later monograph, *The Long Twentieth Century*. It is worth noting that overaccumulation is typically applied not to specific industries, but to capital on a global scale. Although one should be careful either of generalizing small-scale industry behavior, or applying a theory too baggy to a phenomenon too small, the behavior of the phosphate mining companies provide an opportunity to examine, at a smaller scale, certain tendencies toward crisis that appear to be intrinsic to the process of capital accumulation. Moreover, the tendencies that can be identified in the industry – and were identified by contemporaries – such as overproduction and idle capacity, are tendencies that, for the most part, become invisible within the context of neoclassical economics, which either deny their existence or ignore them. It is precisely for this reason that by analyzing the movement of the industry in these terms is instructive. A more detailed account of overaccumulation is given by David Harvey in *The New Imperialism* (Oxford: Oxford University Press, 2003).

“overaccumulation of capital,” which means productive capacities or available capital that far outstrip the actual production that corporations can undertake at a profitable level.

Overaccumulation is the form that intra-industry crises often took in the period after 1920, 1924 being a particularly illuminating example.¹⁰¹ In 1924, the plants were operating at 50% beneath their full capacity, which simultaneously depressed the market but prevented a situation of overproduction.¹⁰² Overaccumulation can be observed in the production numbers in all of the years following the explosively productive year of 1919, the heights of which were never matched during the 1920s, despite the industry’s capacity to do so. Both overproduction and overaccumulation are inextricably linked to the level of technological development of the industry.

The early establishment of a uniform price was largely the market at work; companies with greater capital resources absorbed or bankrupted the smaller companies and the speculative element at work in the industry was gradually quelled. Writing in 1909, trade journalist C. A. Stone could say confidently that the Florida phosphate industry as a whole was “controlled” by only twelve companies, four in the hard rock district and eight in the pebble.¹⁰³ But even despite this, the destabilizing effects continued to be felt. As state geologist Herman Gunter noted at the close of the period, 1928, the industry brought in significantly less “value” per annual tons produced than it did in 1900 – competition and even the relatively minimal changes in mining technology had the effect of driving down the collective profits available for the mining corporations.¹⁰⁴

¹⁰¹ “Phosphate Rock,” *Mineral Resources...* 1924, 94.

¹⁰² *Ibid.*

¹⁰³ Stone, “Mining and Milling,” 492.

¹⁰⁴ Herman Gunter, “Statistics of Mineral Production in Florida during 1928-1929,” *Twenty-first Twenty-second Annual Report of the Florida State Geological Survey*, (Tallahassee: Capital Publishing Co., 1930), 28-29.

There were two external, world market events that shaped the functioning of the industry. The first was an increasing prevalence of North African phosphates (from Morocco and Tunisia) on the world stage; the second was the First World War.¹⁰⁵ The disruption that the First World War brought upon the industry was remarkable and immediately visible. Production numbers plummeted deeply after 1913 and remained low until the tremendous upsurge in 1919, after world markets reopened.¹⁰⁶ The effect of this was that the industry had to deeply curtail production during the war, with plants operating below capacity for fear of upsetting the market prices. The fact that the industry was capable of doing this – of restraining competition for the benefit of the industry – was a remarkable feat, given the out-of-hand competition which defined the industry in the previous decades. The second half of the period (1915-1930) in general is one of relative stabilization after the overproduction crises of the later years of the first decade of the 1900s and the closing of external markets during the war. The introduction of fundamentally new or of more efficient technologies in this climate would have likely resulted in greater losses than gains for the industry as a whole.

Stabilization in the face of international competition was a strategy deliberately pursued by the industry. In *The Fertilizer Industry*, economist Jesse Markham argues that the stabilization of prices in the 1920s was due not to better market conditions after the First World War, but to a successful effort on the part of the largest corporations to circumvent those market conditions by means of collusion.¹⁰⁷ For the most part, this collusion was only barely guised (taking place under the Phosphate Export Association), and was investigated extensively by the Federal Trade

¹⁰⁵ Gray, *Phosphates and Superphosphates*, 10-25, 41-45.

¹⁰⁶ E. H. Sellards, "Statistics on Mineral Production in Florida 1917," *Tenth and Eleventh Annual Report of the Florida State Geological Survey*, (Tallahassee: Capital Publishing Co., 1918), 105.

¹⁰⁷ Jesse Markham, *The Fertilizer Industry: Study of an Imperfect Market* (Nashville: Vanderbilt University Press, 1958), 38-44.

Commission.¹⁰⁸ The effect of the First World War was to cut off trade to Europe, and Germany in particular, which was the largest foreign consumer of U. S. produced phosphates. After the war ended, more lucrative phosphate fields were discovered in North Africa, which began to be mined competitively with the Florida industry and had more immediate access to the European market. These circumstances created pressure on the existing companies to “cooperate” more closely than ever before. The member companies of the Phosphate Export Association met regularly to decide export prices, with equivalent input from each of their companies, and each company was allowed access to the books and records of the others.¹⁰⁹ Before long the export agreements appear to have become implicit domestic price agreement, and the market superficially stabilized during the 1920s. This was a superficial stabilization in the sense that the companies deliberately inflated demand in the domestic market by refraining from investing their capital to lower marginal cost and prices. Any investment of the capital would threaten to reduce prices by increasing large-scale productivity and output-per-man, which would upset the agreed upon balance, and depress profits for every company. In short, and in a manner which is exactly illustrative of Arrighi’s theory of economic crisis, capital accumulated superfluously because investment in technological change would have decreased profits.

Before the industry had stabilized in the 1920s by operating at reduced capacity they faced one other challenge: this time from labor. That labor time and labor costs were a tremendous concern for an industry that reliably had troubles breaking even, much less turning a profit, is shown by mine operators’ collective response to the labor activity that took hold in the region beginning in 1918 and lasted until the early months of 1920. Given their situation of excess capital and meager profit, the complication that could most threaten mine operators’

¹⁰⁸ “Report on the International Phosphate Cartels,” (Washington D.C.: The Federal Trade Commission, 1946.)

¹⁰⁹ Markham, *The Fertilizer Industry*, 40.

already precarious industry was a protracted labor dispute. This is precisely what occurred. In the months between April and early December, thousands of workers in the land pebble industry struck for shorter hours (8, rather than 12) and higher wages.¹¹⁰ Production was brought to a complete halt. In 1918, a year prior to the strike, the response of corporations to the workers' demands was that they would sooner close down the plants and cease production.¹¹¹ This happened, although not on the industry's terms.

The most crucial demand made by the workers, as attested to in their National War Labor Board hearings, was shorter hours. Plants ran two 12 hour shifts per day, day and night, while other mining industries across the country had standardized 8 hour shifts. The conditions described in National War Labor Interviews were severe. The work of historian Moishe Postone on labor time proves illuminating. For Postone the antagonism between labor and capital was one principally based on the determination of the worker's labor time. The position of capital in this situation is somewhat paradoxical: on one hand, longer hours means more production (more "value" being created), but on the other, capital is typically driven to shorten hours by increasing efficiency. But in the phosphate industry's case, more efficiency was precisely not what was wanted. But the worker's demand for shorter hours ended up being, essentially, one for greater technological efficiency. Shorter hours were unfeasible unless output-per-man was made correspondingly greater. In increasing output-per-man, the amount of man power (and labor time) needed *in total* is decreased.¹¹² Which ultimately means, for workers, technological unemployment.¹¹³

¹¹⁰ R. W. Stone "Phosphate Rock Industry in 1919," *The American Fertilizer*, July 31, 1920, 128.

¹¹¹ Docket 680, National War Labor Board.

¹¹² Postone, *Time, Labor and Social Domination*, 288, 309-311.

¹¹³ *Ibid.*

The irony of the industry's reluctant technological change is perfectly illustrated in the decade following the strike: the mines were made more efficient, and the savage conditions of the pits and driers were largely ameliorated by more efficient technological methods – but it did so by getting rid of those miners' positions, permanently. Miners complained about their conditions and so the industry changed the conditions by firing the miners and eliminating the positions from the payroll. This tendency of the industry is excellently illustrated in Haskell and Kiessling's employment statistics, which was a steady downward slope.¹¹⁴ This appears to be the most compelling explanation behind the switch the “dry-mining,” or the transition to electric draglines that occurred in the mid-1920s and would become industry-standard thereafter.

But beyond the mine pit itself, the focus the industry took on increasing the quality of the phosphate rock by means of superior washing and sorting methods was hardly coincidental. Geologist William Waggaman noted in 1920 that the “high price of labor is unquestionably stimulating the production of higher grades” of phosphate for fertilizer use.¹¹⁵ In the same issue, he noted the “labor troubles,” which handicapped the Florida industry, led to lower production levels than the industry had seen in 15 years.¹¹⁶ The practical effect of new sorting, classification and flotation methods was that a similar amount of phosphate could be sold, but by doing *less* mining. There is nothing inherent in market terms that would demand this transition in methods: in 1907, it was in the name of efficiency that the fine rocks were discarded. Rather, the change seems to come from the fact that more mining meant more time and more labor. In a climate in which labor was increasingly demanding fewer hours, and higher pay, the introduction of

¹¹⁴ Haskell and Kiessling, *Technology, Employment and Output-per-man*, 99-100.

¹¹⁵ William Waggaman, “Phosphate Rock,” *The Mineral Industry: Its Statistics, Technology and Trade* 28, 1920, 546.

¹¹⁶ *Ibid.*, 537.

classification and flotation, which the industry had known about for more than a decade but had all but ignored, became a viable and attractive option.¹¹⁷

The seeming stasis of the industry's technology was not one due to simple neglect of technology or a lack of ingenuity or any other similarly reductive explanation. The absence of "free lunches" was due not to a betrayal of the principles of Schumpeterian growth but to a strict adherence to them. As Arrighi has theorized, by building on the works of Schumpeter, and as the phosphate industry illustrates, conditions of disequilibrium constantly lurk near the surface of a large-scale industry. This disequilibrium, which takes the form of competition and antagonism between economic actors, fundamentally affects the degree to which productive potential or technological change can take place. Market imposed and self-imposed restrictions on productive capacity definitively discouraged the industry from operating as efficiently as possible, which meant that the industry took interest in technological change only if it was neither disruptive or, as in the case of the labor strikes, when it became absolutely necessary to retain profitability.

¹¹⁷ Sellards, *Second Annual Report*, 241.

CHAPTER THREE

THE MODERN BUSINESS ENTERPRISE IN NEW SOUTH FLORIDA

The phosphate industry stands as one of, if not the, most characteristically “modern” of Florida’s primary economic bases in the first decades of the 1900s.¹ It was highly consolidated, capitalized and, relative to similar industries in Florida (lumber, naval stores), it was technologically sophisticated. But appraising an industry that upheld segregated and barely livable housing, dismal wages and predatory pricing methods as modern displays the ambivalence of that epithet. This ambivalence is seen in the literature on many industries in the New South: ore mining, textile factories, lumber and naval stores.² One of the foremost debates at the heart of New South historiography since Woodward has been the extent to which the New South as a whole can be considered “New.” Its dubious modernity consists primarily in the degree to which it can be found to exhibit the qualities associated with the typical mature capitalism of the northeast: free labor, urbanization and, above all, industrialization. The question then is: how does Florida’s phosphate industry fit in to the picture of the New South? As modern, fully capitalistic, or in some sense pre-capitalist, and, when this is answered, does the industry’s inclusion into the historiography alter that debate at all?

I argue that Florida’s phosphate industry offers a particularly stark picture of unbalanced growth, for which “new” industrialization is not contrasted with, but is concomitant upon and exacerbates, the “old.” Unbalanced growth, is an economic concept developed both by institutional economists and Marxist economists (“uneven development”) in an attempt to

¹ The idea of “economic base” is borrowed from William Stronge, *The Sunshine Economy: An Economic History of Florida since the Civil War* (Gainesville: University Press of Florida, 2008), 2-9.

² See, e.g, the examination of textile and cotton mills that can be seen in David Carlton and Peter Coclanis, *The South, the Nation and the World* (Charlottesville: University of Virginia Press, 2003) and Douglas Flamming, *Creating the Modern South: Millhands and Managers in Dalton, Georgia, 1884-1984* (Chapel Hill: The University of North Carolina Press, 1992).

understand the coexistence of modernization and residual or persistent “backwardness.” The immediate source of the concept for this chapter are New South economic historians David Carlton and Peter Coclanis.³ The phosphate industry stood as a pocket of industrialization in an otherwise largely rural state. It produced no lasting urbanization, as much of the industry utilized company towns which fed growth back into company profits. Although the effects on the region were not discernably “modern” the industry itself very thoroughly was. The industry possessed all of the traits characteristic of a corporation on the cusp of mature, monopoly capitalism. This includes the concentration of capital, the organizational structures of the industry, the expansion of production and distribution.

This chapter draws on three historiographies that have not yet been connected at any length. Those are political-economic historians of the New South; the economic history of Florida and the institutional economic historians including and following the works of Alfred Chandler. Although these three historiographies naturally align, that they have not yet been put into conversation justifies the exposition and contrast of their positions. For example, almost no work has been done to examine Florida’s economic history and its place within the “New South” – whether that label is even applicable or if, as economic historian William Stronge argues, Florida is better understood as a “Western economy.”⁴

To understand the economic significance and role of the phosphate industry, the scope must be broadened beyond that industry alone. This is because the phosphate mining industry existed principally as one leg of a much larger, national industry – the fertilizer industry.

³ See too Eller, *Miners, Millhands, Mountaineers* for a demonstration of this concept in another mining industry.

⁴ Stronge, *The Sunshine Economy.*, 1.

Phosphate mining provided the crucial nutrient ingredient for the creation of mixed fertilizers.⁵ Because of this, the fertilizer industry found it beneficial to vertically integrate phosphate mining and phosphate rock treatment. The fertilizer industry itself was embedded within two larger, global industries – the chemical and mineral industries.⁶

The secondary literature dealing specifically with the fertilizer industry is as meager as that on the phosphate industry. The most notable monograph was published in 1958 by economist Jesse Markham. Although he narrates changes as they occur within the industry, he does so only barely from perspective of a historian.⁷ Although Markham's economic arguments are astute, his limitations in historical perspective abstracts the fertilizer industry from its place within Florida's economic history and from New South industrialization as a whole. To supplement this, extensive framing is used to wring history from economic analysis. Understanding the typicality or atypicality of the industry in the New South requires understanding how it is organized. This is where institutional economics and economic history, the framework developed by Chandler, Naomi Lamoreux and Glenn Porter, enters. But abstraction remains unavoidable.⁸ Only once a cut-away portrait of the industry in terms of its capital, financing, investments and organizational structure is drawn can it be seen how integral

⁵ The Federal Trade Commission, "Report on the Fertilizer Industry" (Washington: Government Printing Office, 1916), 94.

⁶ Though, these much larger industries can be neglected for this chapter's purposes.

⁷ Jesse W. Markham, *The Fertilizer Industry: Study of an Imperfect Market* (Nashville: The Vanderbilt University Press, 1958).

⁸ Particularly given how little analysis the industry has received. This chapter, more so even than the previous chapters, stands as a promissory note for future work that will utilize the abstract presentation given here as a means to locate the industry much more concretely within the South, and paint a detailed picture of its relationship to agriculture, sharecropping, populism and the "development of underdevelopment" that was so characteristic of the New South's asymmetric modernity.

to the New South it was, and how their most extensive subsidiary concern – phosphate mining – fits into the region.⁹

Phosphate mining and the fertilizer industry

The fertilizer industry as a whole encompassed the producers of fertilizer materials, the brokers and sellers who distributed those materials and the mixers and sellers of those materials. The fertilizer industry proper refers, primarily, to those companies that mixed and sold the fertilizer (referred to as “mixed fertilizer manufacturers”); but, as will be seen, these companies increasingly began to absorb the former two steps of the process into their own business structure. These corporations – the largest domestic corporations being International Agricultural Co. (IAC), American Agricultural Co. (AACC) and the Virginia-Carolina Chemical Co. – were the foremost examples of “mixed fertilizer” producers and sellers.¹⁰ The three named companies were the upper tier of the “Big Six” fertilizer manufacturers, which dominated the fertilizer industry to a remarkable degree.¹¹ In 1916, they produced 58% of the total mixed fertilizer manufactured, in 1922, 65%.¹² As mentioned, the mixed fertilizer industry can be considered as a part of the chemical industry or the minerals industry, depending on the vantage from which it is

⁹ Sources derive primarily from three Federal Trade Commission reports on the behavior of the fertilizer industry, published in 1916, 1923 and 1946, as well as reports from the FTC’s case against the industry in 1946. Although these latter two were produced after the period in question, they frequently reflect upon and utilized data from the industry during the 1910s and ‘20s. More detailed financial reports internal to the industry are available only for a single company, the American Agricultural Chemical Co., in the form of semi-annual reports made by the umbrella phosphate company for AACC executive leadership. Similarly comprehensive internal documents do not appear to be readily available for the other industry leaders. Aside from this, corporate data as reflected in the annual Moody’s investment manual is used; census data on mining and manufacturing activity, the annual reports on the production of the phosphate mining industry as reported by the US and Florida Geological Surveys are used.

¹⁰ FTC, “Report...,” (1916), 90.

¹¹ The remaining three of the “Big Six” are F.S. Royster Guano Co., Swift & Co., Armour Fertilizer Works. Baugh & Sons are also sometimes included. FTC, “Report,” (1916), VII.

¹² Federal Trade Commission, “Report of the Federal Trade Commission on the Fertilizer Industry,” (Washington: Government Printing Office, 1923), 5.

seen. At the point of sale, fertilizer is considered a chemical product, but, prior to the production of the fertilizer for sale, the larger fertilizer manufacturers were heavily engaged in the production, buying and excavation of mineral resources – the most prominent of them being phosphate.

The overwhelming majority of phosphate that was mined was sold to companies within the fertilizer industry, domestic and foreign.¹³ In producing mixed fertilizer, there were three main elements: nitrogen, phosphorous and potash.¹⁴ Of them, it was phosphorous, in the form of acid phosphate, which made up the majority of the fertilizing nutrient that was applied to crops.¹⁵ Acid phosphate was formed by applying sulfuric acid to phosphate rock in a large chamber.¹⁶ The largest share of phosphate rock mined was bought by fertilizer manufactures, either via brokers, on the market or purchased internally by a manufacturer owning a mining company to be used in the production of acid phosphate.¹⁷ Phosphate rock, then, provided the most essential part of the most essential ingredient in mixed fertilizer. That the fertilizer industry should take an interest in phosphate mining is of little surprise.¹⁸

The fertilizer industry became intimately connected with the phosphate mining industry shortly after the birth of the latter; some of the first mining companies were also fertilizer manufacturers. This relationship can be more explicitly drawn. The names of the mine operators brought before the National War Labor Board in 1918 included all of the major companies in the pebble mining industry.¹⁹ The eleven mine operators from the NWLB hearings were as

¹³ FTC, “Report...” (1916), 86, 94.

¹⁴ Markham, *The Fertilizer Industry*, 26.

¹⁵ FTC, “Report...” (1916), 94.

¹⁶ *Ibid.*, 90.

¹⁷ *Ibid.*, 94-95.

¹⁸ FTC (1923), 25

¹⁹ Docket 680, Record Group 2, Records of the National War Labor Board, National Archives, College Park, Maryland, 1-2.

follows: American Cyanamid Co., Lakeland Phosphate Co., Phosphate Mining Co., Swift & Co., The Florida Phosphate Mining Co., Coronet Phosphate Co., Palmetto Phosphate Co., American Agricultural and Chemical Co., the Armour Fertilizer Works, International Agricultural Corporation, Charleston Mining and Manufacturing Co.

Although the exact companies operating differed slightly in the decade before and after 1918, the list is representative of the industry in its maturity. Once the initial period of consolidation had occurred, the companies operating remained largely consistent, and changes were rarely the result of new investors, but rather of combinations of firms at the level of the fertilizer manufacturer. Or in some cases, the clarification that “different” companies were, in fact, owned subsidiaries of the same fertilizer manufacturer. Therefore, the list is representative in another way: representative of the, at times baldly, deceptive branding practices that persisted even after an initial investigation by the Federal Trade Commission. Of those companies: the Palmetto Phosphate Co. of Nichols is a subsidiary of the American Agricultural Chemical Co.; The Florida Phosphate Mining Co. is a subsidiary of F. S. Royster Guano Co.; The Phosphate Mining Co. is a subsidiary of Peters, White & Co., and, most notably, the Charleston Mining and Manufacturing Co. is the main phosphate arm of the Virginia-Carolina Chemical Co.²⁰ Swift & Co., although listed by that name, also operated as the State Phosphate Co.²¹ As well as the mining companies that were operated as differently named subsidiaries, the American Cyanamid Co., Swift & Co., the American Agricultural and Chemical Co. (hereafter AACC) and the International Agricultural Co. (hereafter IAC) operated under their own names and were large

²⁰ FTC, “Report...” (1916), 97, 98; “American Agricultural Chemical Company,” *Moody’s Manual of Investments: Industrials* (New York: Moody’s Investor Services), 980.

²¹ FTC, “Report,” (1916), 210.

vertically integrated fertilizer manufacturers headquartered outside of Florida, the phosphate mining operations of which are only one aspect of their business.

This adequately demonstrates the extent to which phosphate mining was dominated by the mixed fertilizer manufacturers. Of the “Big Six” fertilizer manufacturers, every one of them is represented. And of the mining the companies listed, the largest mining operations were those possessed by the IAC, AACC and Virginia-Charleston Chemical Co. (hereafter VCC), who collectively mined hundreds of thousands of acres of Florida’s phosphate fields.²² The concentration in the field only intensified after this point – by 1928, only eight companies were actively mining land pebble.²³

With the primary companies identified, the industries can be organized thematically, drawing on the interpretive categories developed by Chandler and by historians writing in his wake, particularly Naomi Lamoreaux and Glenn Porter.²⁴ Chandler pays only brief attention to the industry in *The Visible Hand*; but, in an earlier, and equally seminal essay, “The Beginnings of ‘Big Business’ in American History,” the mixed fertilizer industry is singled out briefly but specifically to demonstrate his theses on modern business organization.²⁵ In particular, Chandler notes that the Virginia-Carolina Chemical Co. and the American Agricultural Chemical Company are central examples of the four trends he identifies as typical of modern business organization, “integration, combination, diversification, administration.”²⁶ He goes on to note of modern industry that “combination” (or horizontal integration) is followed by vertical

²² Ibid., 181-207.

²³ “Phosphate Rock,” in *Mineral Resources of the United States: 1928* (Washington: Government Printing Office), 253-275.

²⁴ Naomi Lamoreaux, *The Great Merger Movement in American Business 1895-1904* (Cambridge: Cambridge University Press, 1985); Glenn Porter, *The Rise of Big Business, 1860-1920*, 3rd ed. (Wheeling: Harlan Davidson, 2006).

²⁵ Alfred Chandler, “The Beginnings of ‘Big Business in American History,” *The Business History Review* (vol. 33, n. 1, Spring 1959), 17.

²⁶ Ibid., 1.

integration. VCC follows this trend exactly – consolidating in the 1890s, the corporation then turns toward investing in phosphate mining; and its “major competitor,” AACC, does the same.²⁷

Without deviating much from the lines drawn by Chandler, modern industry can be typified by both consolidation or horizontal integration and vertical integration (including scope of distribution and capital requirements). It is fruitful to add to this, contra Chandler, certain patterns of competition that persisted despite integration and subsequent cartelization as a response to this competition. Within each of these typically modern aspects of modern industry, the fertilizer industry and its subsidiary phosphate mining companies can be seen not to lag at all behind any of the characteristic industries examined in *The Visible Hand*.²⁸ Alongside these categories, there are two narrative trends that emerged as the industry matured: an early period of horizontal integration was followed by a period of vertical integration; and a period of competition followed by a period of collusion and cartelization. These two broad trends do overlap, but not exactly. Periods of the most extensive competition occurred after the consolidations of the "great merger movement" took place in the early years of the century, and competition between these massive firms still prevailed.

²⁷ Ibid., 18.

²⁸ Alfred Chandler, *The Visible Hand: The Managerial Revolution in American Business* (Harvard: Harvard University Press, 1977). It should be noted that the criticisms of Chandler that I have encountered do little to challenge the broad categories that he lays down – the concepts used when looking through historical materials. At most, historians such as Philip Scranton have supplemented them; nuance added by expanding the scope to industries not covered by Chandler. The most relevant arguments have, quite rightly, been directed toward his uncritical embrace of technological determinism; that is, the attribution of agency to certain technological developments as the motive force behind “modern industries” unique developments. On this note, David Noble’s arguments are sufficiently forceful a rebuttal. Another salient argument would dispute that modern industry had genuinely alleviated competitive conditions; but, the degree to which Chandler is guilty of that charge is disputable.

Consolidation

In the pattern identified by Chandler, consolidation preceded vertical integration. This held true in the fertilizer and phosphate industries. The first half of this pattern, horizontal integration, is given its canonical historiographic expression in Lamoreaux's work *The Great Merger Movement*. Lamoreaux distinguishes a period spanning the last decade of the 1800s to the first decade of the new century as characterized by a particular form of capitalist competition, which resulted in the expansion of firms by way of mergers or consolidations occurring within an industry.²⁹ Her argument provided a counterpoint to Chandler's picture of industries which had integrated away competitive pressures; instead, consolidation resulted from intensely competitive conditions characterized by overproduction, falling profitability rates and high capital requirements. She also looked to young, capital-intensive industries, rather than mature industries; the latter are more prone to vertical integration. In all respects, the early phosphate mining industry exemplifies Lamoreaux's argument; not only does it fit the time frame (although it matures a few years later than the industries she examines), it experienced the exact pattern of speculative fervor followed by sharp declines in profitability; followed by consolidation, and, finally, stabilization at a lower rate of profit.

Consolidation within the early mining industry was a well-observed fact; it was, moreover, a celebrated fact, by industry and government observers.³⁰ Horizontal integration occurred both in the phosphate mining industry and in the fertilizer industry; but it is the former which more completely demonstrates Lamoreaux's theses. But, to some extent, divorcing the horizontal integration of the mining companies from the vertical integration of the large fertilizer

²⁹ Lamoreaux, *Great Merger Movement*, esp. 14-45.

³⁰ "Government observers" referencing the geologists writing for the federal *Mineral Resources* and Florida state geologist (during this period, E. H. Sellards) writing in that Survey's *Annual Report*.

firms is misleading. In many cases, horizontal integration at the level of mining companies was followed by vertical integration at the level of the fertilizer corporation.³¹

Among mining companies, the move toward consolidation came fast and early. Mining began in the rivers and fields of central Florida in the early 1890s; the speculative rush to enter the fields was intense.³² The early investors possessed widely varying amounts of capital; some of them immediately began constructing plants, some investors never touched shovel to dirt.³³ Within the first five years, prices for phosphate rock had almost completely collapsed. By 1897, the industry had entered into what one observer called a “severe depression.”³⁴ What it led to was a tremendous shakeout of the industry. In 1890 there were 252 mining interests prospecting and investing in land.³⁵ This corresponds quite neatly with Lamoreaux’s characterization of early speculation.³⁶ By 1897, there were only 28 mining companies still in operation.³⁷ The number of firms being operated in Florida remained around this level, with a slow decline over the following ten years.

From 28 companies in 1897 to the stabilized dozen that remained by 1918 was not nearly so steep a drop off as occurred in the first years of the industry. But this is hardly surprising. Again, following the model discerned by Lamoreaux, an early, speculative industry will collapse into stability very quickly. This was accompanied by the severe depression of prices that characterizes overproduction is something that would continue to haunt the industry. The slow

³¹ The integration of three mining companies under the American Phosphate Mining Co. was, simultaneously, the acquisition of that consolidated concern by the AACC, who had independently controlled the three mining companies.

³² “Phosphate Rock,” Nineteenth Annual Report of the United States Geological Survey (Washington: Government Printing Office, 1898), 535-544.

³³ Ibid.

³⁴ Ibid.

³⁵ Ibid.

³⁶ Lamoreaux, *Great Merger Movement*, 46-47.

³⁷ USGS, *Nineteenth Annual Report*, 535-544.

decline from 28 operators to a dozen can be seen in hard rock and in land pebble. Mine operators desired to absorb as much land and fixed capital as possible. This can be seen, for example, by the early acquisition of concerns and land along the Peace River by the Peace River Consolidated Phosphate Company.³⁸ This openly consolidated company also acquired miles of railway built along their site.³⁹ This acquisition and building of transportation facilities was another step in consolidation. A telling example of early horizontal consolidation came in 1903: there were eight plants actively mining land pebble in Florida; that same year, a Joseph Hull of Savanna consolidated four of the large mining companies: Prairie Pebble Phosphate Co., Phosphoria Phosphate Co., Florida Engineering Co. and Land Pebble Phosphate Co., a “major part” of the Florida land pebble trade.⁴⁰ In one move, Hull acquired a sizable portion of the industry.

Specific data on the smaller concerns that were bought out or consolidated is more difficult to place definitively, for the simple reason that a reliable, annual listing of the companies in operation in the region would not be undertaken until 1909, by the Florida State Geological Survey.⁴¹ Even then, although the industry had become relatively stable, discerning patterns is complicated by the fact that the geologist rarely reported on consolidations. Observers of the industry found little they more enjoyed discussing than consolidation, although they gave specifics only occasionally. Joseph Struthers of the USGS wrote in unequivocal praise of “the application of modern business methods” in the industry, by which he meant that “larger mining companies have purchased additional property” and, notably, that they had begun to make an effort “through combination of interests to establish a uniform price and eliminate

³⁸ Ibid., 544.

³⁹ Ibid.

⁴⁰ Charles C. Schnatterbeck, “Phosphate Rock and Phosphorous,” in *The Mineral Industry During 1903* (New York: The Engineering and Mining Journal, 1904), 293-294.

⁴¹ E. H. Sellards, *First Annual Report of the Florida State Geological Survey* (Tallahassee: Capital Publishing Services, 1909), p. 39.

competition.”⁴² This was hardly an isolated comment, and cannot be taken simply as apologia for monopoly. The industry’s prices had plummeted to such an extent that production was at times more costly than it was profitable.⁴³ Heading the annual reports for the following years, “the tendency toward consolidation” recurred as this tendency remained unabated.⁴⁴ Writing in 1902, “in general there appears to be a tendency toward a combination of the larger producers and the gradual absorption of the smaller mines by the larger operators.”⁴⁵ In 1903, remarking on the status of the industry, it was noted that “the foremost feature is the centralization of control in a few hands of the larger hard-rock and land pebble mines, either by direct purchase or consolidation agreement.”⁴⁶ Later in his report, the author described it as “consolidation fever.”⁴⁷

More specifics can be found slightly later. In the 1910s, the most significant consolidations occurred when the American Phosphate Mining Co. bought the plants and land associated with the Pebbledale Phosphate Company, the Pierce Phosphate Company in Pierce and the Peace River Phosphate Company.⁴⁸ Pebbledale and Pierce had been visible names within the industry until that point, and their consolidation under one title was notable. But this consolidation appeared distinct from what was identified as the primary trend in the early years of the industry; it was a “horizontal” integration in that it consolidated firms operating in direct competition of each other, on the same material, with the same methods. However, what went little noted until required by the Federal Trade Commission, was that this “horizontal”

⁴² Joseph Struthers, “Phosphate Rock” in *Mineral Resources of the United States in 1901* (Washington: Government Printing Office, 1902), 811.

⁴³ *Federal Trade Commission Decisions: Findings, Orders and Stipulations* (Washington: Government Printing Office, 1946), 593.

⁴⁴ This line can be seen in the 1901, 1902, 1903 USGS reports.

⁴⁵ C. G. Memminger, “Phosphate Mining Industry of the United States During 1902,” in *The Mineral Industry During 1902* (New York: The Engineering and Mining Journal), 520.

⁴⁶ *Ibid.*, 521-522.

⁴⁷ *Ibid.*

⁴⁸ FTC, “Report” (1916), 199.

consolidation was, simultaneously, a vertical acquisition: the Florida Phosphate Mining Company was an owned subsidiary of AACC.⁴⁹ Likewise, in 1910, IAC bought the phosphate land (40,000 acres in total) and capital stock owned by two exceedingly large firms, the Prairie Pebble Phosphate Co. and the Florida Mining Co.⁵⁰

Consolidation was hardly confined to the mining industry; it was as common among fertilizer manufacturers in the same period. But as fertilizer manufacturing was a more mature industry and less prone to the speculative depressions of phosphate mining, it did appear in a different form. Among fertilizer manufacturers, the move toward horizontal consolidation was exemplified by the two largest companies, both of which began extravagantly. The largest of the fertilizer manufactures, the Virginia-Carolina Chemical Co. made its first appearance in South Carolina in 1901 – it was the result of the consolidation of “something like 39” fertilizer manufacturers.⁵¹ The FTC report went on to say that prior to 1903, VCC had acquired “nearly all” of the independent fertilizer concerns in the Southern states of South Carolina, Georgia and Alabama.⁵² The AACC began similarly auspiciously. In 1899, it was formed by consolidating the property and capital stock of about three dozen fertilizer manufactures, which made it, alongside VCC, the largest fertilizer manufacturer in the country.⁵³

After the period of initial consolidation, the fertilizer mixing manufactures continued to consolidate and buy other fertilizer manufacturers and mixing plants. Interestingly, both AACC and VCC name the first company to attempt to integrate small dry-mixing plants and sellers as

⁴⁹ Ibid.

⁵⁰ Ibid., 207.

⁵¹ Ibid., 182.

⁵² Ibid., 170, 182.

⁵³ Ibid, 191.

the International Agricultural Corporation.⁵⁴ Both VCC and AACC claim that, given the competitive acquisitions of the IAC, it was indeed “necessary” that they begin to operate similarly. But it would make sense to see IAC vigorously pursuing such a policy against its rivals. The IAC was, comparatively, a more recently organized corporation.⁵⁵ Although, by 1916, it had already firmly established itself as among the three largest manufacturers of the “Big Six,” it was entering an industry already dominated by the two largest concerns. By 1914, AACC had acquired control of more than 17 dry mixing concerns and was, until the FTC investigation, offering the fertilizers mixed therein as separate brands.⁵⁶ This was consolidation on a massive scale. Compared to this, consolidation in the mining industry was a small affair. And in the mining industry, by the late 1900s, the tendency had already begun to drop off. References to centralization and consolidation were far less frequent and industry observers began to concern themselves instead with those competitive pressures, domestic and foreign, that plagued the industry even after consolidation.

Vertical integration

For Chandler and the historiography of American business written in his wake, there is no phenomenon as prominent upon as vertical integration. The logic vertical integration is simple: as firms grew, it became profitable to internalize as much of the production, distribution and selling process as was feasible, to avoid reliance on competitors and vulnerability to market downturns at any single point in the production process.⁵⁷ Business historian Glenn Porter discusses the drive toward vertical integration as multi-part, technological, heavy capital

⁵⁴ Ibid., 180-181.

⁵⁵ Ibid., 203.

⁵⁶ Ibid., 10.

⁵⁷ Porter, *Big Business*, 10-11.

investment, mass-unit production; with high entry barriers due to "the capital needs, complex costs, and competitive environments."⁵⁸

The impetus for vertical integration was especially pressing for mixed fertilizer manufacturers.⁵⁹ The mixing of fertilizer materials for sale was itself a very low-capital enterprise. The field was saturated by fertilizer manufacturers, companies purchasing, mixing and branding for sale fertilizer materials – the number hovered around 800 even after the consolidation efforts of AACC and VCC.⁶⁰ All that was required to mix fertilizer materials was a shovel and screen; competition was, therefore, common, and the capital boundaries for entry into fertilizer mixing were low.⁶¹ Although mixing could be engaged in by the farmer or general merchant, the fertilizer manufacturers with access to large mixing plants had the distinct advantage. As noted in the previous section, it was in the interest of fertilizer manufacturers to purchase and operate as independent a large number of mixers.⁶² But even owning the largest share of mixers, and operating them as independents could not overcome that the industry was low-barrier. So fertilizer manufacturers began to invest in the production of the fertilizer materials required for mixing and selling: phosphate rock, cottonseed oil, tankage, dried blood, sulfuric acid, fish scrap. For the first fifteen years here examined, the production of potash was not even an option for most producers, as it was controlled via state-sanctioned monopoly in Germany.⁶³ The strategy: by controlling the fertilizer materials at their source, larger mixed

⁵⁸ Ibid., 12-13, cf., too 18-19.

⁵⁹ FTC, "Report" (1916), 10.

⁶⁰ Ibid., 9

⁶¹ Ibid., 10

⁶² Ibid., 11.

⁶³ Ibid., 105-107.

fertilizer manufacturers would be able to control what was available to other sellers, and thereby price out their competitors.⁶⁴

Although these manufacturers would acquire stakes in the production of nitrates and ammoniates, it was the phosphorous component of fertilizer that was the cornerstone of this integration. The riskiest, most capital intensive, most necessary and valuable vertical acquisition of mixed fertilizer companies, by far, was their investment in the production of acid phosphate; i.e., the acquisition of phosphate mining properties, methods of making sulfuric acid and plants used to produce acid phosphate from those two materials.⁶⁵ As Markham notes, nearly all phosphate rock producers were vertically integrated, producing superphosphate and mixed fertilizer.⁶⁶

Vertical integration began among fertilizer manufacturers not long after their formation via consolidation, but became a commonplace strategy only in the 1910s. Evidence of early vertical integration in the region can be seen in AACC's activity in the Peace River area. In 1903, shortly after acquiring the Peace River Phosphate Mining Co., they began to use the pebble rock being mined almost exclusively for internal consumption – the first year of the mining companies operation under AACC ownership produced over 65,000 tons of rock, all of which was consumed by the company.⁶⁷ An industry observer noted, “the entrance of a Northern fertilizer combination into the phosphate mining industry was the result of a change in economic management of its manufacturing business.”⁶⁸ The AACC purchase and management of the Florida Mining Co., and the firms consolidated within it, in 1909-1910, noted above,

⁶⁴ Ibid., 10.

⁶⁵ Markham, *The Fertilizer Industry*, 27-28.

⁶⁶ Ibid., 62.

⁶⁷ Memminger, “Phosphate... 1902,” 522.

⁶⁸ Ibid.

demonstrates that this change in economic management had become the standard within the mining industry.

A number of the largest phosphate mining companies were owned subsidiaries of the Big Six fertilizer manufacturers or of slightly smaller fertilizer manufactures (American Cyanamid), with only a small handful operating independently (Coronet being the largest). The phosphate land owned by these companies was tremendous, with AACC alone possessing more than 100,000 acres of phosphate deposits in Florida as of 1922; VCC and IAC both possessed deposits nearly as large.⁶⁹ It is instructive to consider the organizational structure of three of the larger concerns, if only to demonstrate the remarkable degree of their vertical integration. In every regard, these companies embodied the modern industrial logic characterized by Chandler and Porter. They were highly capitalized, and organizationally distributed across the country and, in some cases, internationally. The AACC was headquartered in New York and in 1923 was capitalized at 36 million dollars.⁷⁰

AACC's mining companies (incorporated under the American Phosphate Mining Co.) in 1909 were worth 200,000 to 300,000 dollars in profits according to internal documents belonging to the company.⁷¹ Between 1911 and 1912 the company invested particularly heavily in phosphate rock mining. In the former year, its phosphate concerns were valued at 3 million, while the following year saw them climb to 16 million.⁷² In 1916, the American Phosphate Mining Co.'s capital stock was reported at more than 1.5 million.⁷³ The AACC was also invested in fertilizer sellers across the United States, the largest of them Coe-Mortimer and Bowker,

⁶⁹ FTC, "Report" (1923), 35.

⁷⁰ *Ibid.*, 14-15.

⁷¹ Box 3, IMC-Agrico Phosphate Company Collection, Special Collections Department, Tampa Library, University of South Florida, Tampa Florida. (This is the "preferred citation" listed by USF's special collections.)

⁷² FTC, "Report" (1916), 192.

⁷³ *Ibid.*, 194.

rendering businesses in Detroit, but even the largest of these were less capitalized than their phosphate mining concerns. The VCC was also heavily invested in the mining of phosphate rock, owning the entire two million dollars of capital stock of the Charleston Mining and Manufacturing Co., and 1914, half of the stock of the Amalgamated Phosphate Co.⁷⁴ The financial benefits of investing in phosphate mining was clear for the companies with capital stock large enough to do so, but this integration was very capital intensive, the result of the requirements of mining phosphate rock and producing superphosphate.

Superphosphate (or acid phosphate, the latter being the more inclusive term, referring to any phosphate rock that has been treated with sulfuric acids) was an expensive risk due to the production process required to make it.⁷⁵ Acid phosphate, “the largest investment” in the industry, required the production or purchase of sulfuric acid, and then the storage of that acid.⁷⁶ The large chambers that the companies used to house the sulfuric acid were subject to extremely rapid deterioration, requiring replacement every ten years.⁷⁷ Moreover, the chambers required for the production of acid phosphate cannot be shut down.⁷⁸ Although fertilizer manufactures had become heavily invested in rock mining and production, not all of the larger firms produced their own acid phosphate. However, when the rock industry took price hits due to the chronic overproduction and due to wartime market limitations, “at least one” company mining phosphate after 1913 found it necessary to go into acid phosphate production; the rock they had mined under conditions of overproduction remained unsold and would have remained so otherwise.⁷⁹

⁷⁴ Ibid., 191.

⁷⁵ FTC, “Report” (1923), 24, 34.

⁷⁶ Ibid.

⁷⁷ Ibid.

⁷⁸ Ibid.

⁷⁹ FTC, “Report” (1916), 155.

On the whole though, “it is in the production and sale of acid phosphate” that the larger manufacturers have the largest advantage over smaller fertilizer capitals. In their control of the phosphate deposits and of the production process for acid phosphates, these manufacturers “practically control a natural resource” and by doing so, drive out most competition.⁸⁰

Although phosphate was the most completely vertically integrated of the fertilizer material producers, vertical integration had a larger scope phosphate mining.⁸¹ Fertilizer manufacturers took an interest in controlling the production of other fertilizer materials and in the mixing and distribution of the fertilizer. Armour and Swift and Co. were noted for their investment in and production of organic ammoniates such as tankage and dried blood.⁸² AACC invested in its own rendering plants near Detroit.⁸³ VCC’s purchase of the Southern Cotton Oil Co. was another attempt by a fertilizer manufacturer to control the production of materials.⁸⁴

Integration began to encompass distribution. VCC and AACC started to buy subsidiary fertilizer sellers, even those without their own mixing plants.⁸⁵ This was part of the strategy to acquire as many brands and “formulas” (even if identical) of mixed fertilizer as was possible. Many of these were local, Southern sellers, who had sold brands already popular among consumers. The clear motivation was to market these without identification that they had been absorbed by a larger firm. Brand loyalty among farmers would ensure that this would be profitable. This strategy also highlights another aspect of vertical integration: the idea of spreading out risk by creating a larger distribution network.⁸⁶

⁸⁰ FTC, “Report” (1923), 34.

⁸¹ Markham, *The Fertilizer Industry*, 33.

⁸² FTC, “Report” (1916), 67.

⁸³ *Ibid.*, 194.

⁸⁴ *Ibid.*, 94, 186

⁸⁵ FTC, “Report” (1916), 10.

⁸⁶ FTC, “Report” (1916), 12.

Competitive pressure and cartelization

Despite the predominance of both forms of economic “integration” – which are, by design, intended to minimize competitive pressures, establish a uniform price and to stabilize profits – the phosphate mining industry throughout the 1910s and early 1920s remained riven by instability. This derived, more often than not, from competitive pressures that plagued the industry and raised concern among advocates.⁸⁷ The most salient form of these competitive pressures was overproduction. Overproduction, or flooding the market with supply, resulted in price-cutting used as a means of undercutting competition. By the 1910s, phosphate mining industry leaders appeared to have realized that given the degree of stabilization in the mining industry, this would have only diminished their own profits. Some overproduction appears to have resulted from unfortunate characteristics of the demands of the fertilizer industry, including the manner by which acid phosphate was produced (which prevented ceasing production) and the stockpiling of rock resulting from decreases in international and domestic demand.

If centralization was the predominant topic for industry observers in the first years of the industry, overproduction followed closely behind and, before long, overtook it. Overproduction was reported in 1910 in the hard rock industry; the response was to sharply curtail production to keep prices from plummeting.⁸⁸ Pebble rock followed suit; 1909 was a particularly strong year for the industry, production was ramped up to meet expected demand and the industry was flooded with supply. By 1913, prices of phosphate rock were badly hurt by the abundance of material available. During that year and during the first year of the war, phosphate rock was

⁸⁷ C. G. Memminger, “Florida Phosphate in 1910,” *Engineering and Mining Journal* 91, February 4, 1911, 264.

⁸⁸ “Phosphate Rock,” in *The Mineral Industry: Its Statistics, Technology and Trade During 1910*, (New York: McGraw Hill Publishing, 1911). Industry-wide overproduction was further detailed in Chapter 2.

selling for prices below the costs of mining.⁸⁹ And between 1907 and 1914, every year reported increased tonnage of rock mined, and, just as reliably, showed a steady decline in prices.⁹⁰ Beyond mining, acid phosphate itself was prone to overproduction, and during this period, particularly 1911, demonstrated this tendency.⁹¹

In the years after the war, overproduction and low phosphate rock prices hurt the owners of the rock deposits. This resulted in and was exacerbated by growing back supplies of sulfuric acid.⁹² In 1921, the phosphate rock prices again suffered “severe depression” (a phrase that has been commonly encountered since the 1890s in the industry), with sales lower than any peacetime year since 1905.⁹³ This was attributed by government observers to the industry’s misguided expectations of an immediate postwar recovery of demand. As a result of this expectation mining companies ramped up production and flooded the market. As late as 1922, the competition between the Big Six fertilizers, throughout the industry, remained “keen.”⁹⁴ Still the prices of production, mining the phosphate rock, exceeded that of the prices paid for the rock.⁹⁵ Though overproduction was not the lone cause. Markets for fertilizer remained small during these years, which contributed to the inability of rock producers to sell their products, raw, as acid phosphate or as mixed fertilizer.

The stabilization of phosphate rock prices that occurred, when it did occur, in the 1900s and ‘10s, was, as mentioned above, a result of regular market forces and of shrewd planning on the part of individual firms. But the attempt to avoid the loss of profits by not undercutting

⁸⁹ FTC, “Report” (1916), 101

⁹⁰ *Ibid.*, 154.

⁹¹ *Ibid.*

⁹² FTC, “Report” (1923), 6.

⁹³ *Ibid.*, 25.

⁹⁴ *Ibid.*, 8.

⁹⁵ *Ibid.*

competitors via price-cutting did not (or did not yet) constitute deliberate collusion on domestic prices. Both the AACC and VCC were too large for either to seriously consider that price-cutting phosphate rock would run out of business; the presence of large firms acting as constant competitive pressure and the desire to avoid a price collapse acted to stabilize the industry to some extent. Although domestic prices could be stabilized, foreign prices became much more volatile in the middle of the 1910s. The most immediate cause of this was the war, which cut off the business of the largest buyer of hard rock phosphate, Germany. Beyond phosphate, this hurt fertilizer manufacturers by removing what had been until that time the world's sole producer of potash, another common fertilizer ingredient.⁹⁶

Competition in the fertilizer industry extended well beyond the tumultuous and grinding field of phosphate mining. Cottonseed meal, familiar because of the VCC's heavy investment in that industry, was another market prone to overproduction, despite the VCC's attempt to control the production of that material. In the 1920s, this overproduction badly hurt the industry, driving profitability down sharply.⁹⁷ Prior to the 1920s, there had been localized attempts at controlling prices within the industry, but even these proved unsuccessful. The groups met under the name "Sons of Plato," organized ostensibly as a social group; but market forces continued to prevail despite the VCC's heavy capitalization and the attempts of the industry.⁹⁸ Beyond cottonseed, phosphate or any of the individual materials, the mixed fertilizer industry itself was open to competition from smaller mixers. As late as the 1920s, industry observers still did not find that it was established on a "sound bases" – that is, at a sustainable level of profitability.⁹⁹

⁹⁶ FTC, "Report" (1916), 104-113.

⁹⁷ FTC, "Report" (1923), 33.

⁹⁸ FTC, "Report" (1916), 65.

⁹⁹ FTC, "Report" (1923), 56.

The explicit cartelization of the phosphate industry was undertaken in 1919 under the sanction of the Webb-Pomerene Act.¹⁰⁰ Three organizations were founded. The two for pebble phosphate – the Phosphate Export Association and Florida Pebble Phosphate Association – merged in 1933, though they had already been under the same management and consisted of the same member companies.¹⁰¹ All of the larger mining companies were members.¹⁰² The policies of the associations were decided jointly by a council with representatives from the member companies. The initial impetus for cartelization was solely to control export pricing. After the war, competition from other phosphate mines, particularly in North Africa, threatened export profits. Not only were prices fixed, but sales were allocated and quotas determined for each of the member companies. The export business benefited markedly from this arrangement.¹⁰³ Arranging domestic prices proved more difficult. Competition from mines in Tennessee acted to keep domestic prices lower than export prices. However, member companies had access to internal documentation of fellow members, which allowed the control of production levels without explicit price setting. This was the ultimate solution to the problem of overproduction within the industry, and price wars would not erupt again in the domestic market until 1935.¹⁰⁴ The cartels also monopolized the use of chemical flotation for the industry by patent and threatened suit when non-members attempted to use the method.

¹⁰⁰ FTC, *Report on the International Phosphate Cartels*, 4.

¹⁰¹ *Ibid.*, 3.

¹⁰² *Ibid.*, 5.

¹⁰³ *Ibid.*, 9.

¹⁰⁴ *Ibid.*, 38.

Phosphate and Florida's "New South" economy

Florida is nearly bereft of economic histories. The lone recent monograph is William Stronge's *The Sunshine Economy*. Stronge argues that the most characteristic and notable aspect of Florida's 20th century economy has been the growth of the "sunshine economy" and its precedence over what he identifies as the three other aspects of Florida's economic base (defined as the foremost areas of economic activity within a state or region).¹⁰⁵ The four economic bases of Florida's 20th century economy were the sunshine industry (tourism, seasonal vegetation), the maritime industry (cigar manufacture, fishing), Southern agriculture and the "frontier industry."¹⁰⁶ The frontier industry was the economic base that contained phosphate mining. It is characterized as "frontier" because its productive activity was premised on unsustainable extractive activity, similar to the extractive mining industries of the Western states. Other activities included under this label are lumber and naval stores. Phosphate is the first industry Stronge discusses (emphasizing its importance) and it is by a great distance the most characteristically modern of Florida's extractive industries. Although it trailed behind naval stores in the 1890s, it rapidly succeeded it after the turn of the century; and it vied with lumber as the most economically active section of the frontier economy. This is especially notable when it is realized that the "sunshine economy" about which Stronge is writing did not come into a stable existence until after the 1930s – so, for the entire period this thesis covers, the primary economic base of Florida's economy was extractive. Even by 1930, 40% of the state's economy activity was attributable to this frontier economy, of which phosphate made up a significant portion, second only to lumber.¹⁰⁷

¹⁰⁵ Stronge, *The Sunshine Economy*, XX.

¹⁰⁶ *Ibid.*, 13.

¹⁰⁷ *Ibid.*, 111.

The traditional Southern staple crops played essentially no role in the economy of the state during these decades. It is for this reason, and for its peripheral location, that Stronge characterizes the Florida of the late 1880s as more Western than Southern. But this seems like a bad abstraction. Florida shared the social characteristics (including population demographics, legal segregation) that are associated with the Jim Crow south and its extractive industries, especially phosphate, turn out to be integral to the South's traditional economic crops.

The local economic benefits of the phosphate mines in Central Florida appear to have been underwhelming. The barely livable housing provided for workers has been documented. These mining camps and the small towns near them (such as Mulberry) did not receive enough from the mine operators to be invested in sustained local growth. The towns never became urban centers like Birmingham, but lingered as extractive outposts for decades. Florida itself performed little better, sharing with the rest of the South its poverty. The most noteworthy economic event for the state in the 1920s was a real estate boom, a fury of land speculation that amounted to little real development. Phosphate mining, the most modern part of a modern industry, offered little more to the local region than barely sustainable wage labor.

Phosphate mining was a high capital, low profit part of an already fairly low profit industry; the production of acid phosphate (or superphosphates) from mined phosphate rock was capital intensive and tended to result in overproduction crises. That such an industry would encounter difficulties with and, as far as possible, resist organization by, labor, becomes clear; that they would resist increases in productive capacity until it was certain that such increases wouldn't result in only greater overproduction and loss of profitability is also clear.

For a number of scholars, industrialization is central to their understanding of the New South.¹⁰⁸ The field bifurcates along the lines of those who take the limited industrialization that the region did see as evidence of something genuinely capitalist and modern and those who resist this characterization as overly optimistic, and instead stress that continuity with an Old South.¹⁰⁹ The latter approach is taken by Howard Rabniowitz, who is deeply skeptical that the South was, in 1920, any more modern than it had been in the postbellum period: he cites the reliance on agriculture and the incapacity of the region to diversify its economy, the absence of urbanization and the sporadic industrialization.¹¹⁰ This is as close to a canonical statement of a South that had resisted, or avoided, modernization as one can hope for, but postbellum Southern historian Scott Marler goes further, suggesting that until the New Deal, Southern business was so reliant on mercantile structures and cotton that it did not become fully capitalist until the New Deal period.¹¹¹ David Carlton offers the canonical statement of a modern, fully capitalist New South, in his essay “The Revolution From Above.”¹¹²

Against the idea that the regional economy can be characterized as a whole as backward or modern, Carlton and Coclanis offer another, more potent conceptual tool. The very means of modernization were, at the same time, means by which areas remained underdeveloped. Development and poverty not only existed side by side, but development (and modernization) often exacerbated poverty. The framework of “unbalanced growth” is illuminating for both the

¹⁰⁸ Carlton and Coclanis are the most referenced in this chapter; but, James Cobb, *Industrialization and Southern Society 1877-1984* (Lexington: The University of Kentucky Press, 1984) looms just as large.

¹⁰⁹ Then, too, the question of whether the Old South qualified as “fully capitalist” or not is a contentious one. Fogel and Engerman, for example, affirm that it was, while Eugene Genovese and, following his influence, Scott Marler argue that the Old South was, at best, “merchant capitalist” which, in the Marxist periodizing schema from which this is borrowed, is something like the halfway house between feudal and pre-capitalist relations of production and the “full capitalism” that is industrial capitalism.

¹¹⁰ Howard Rabniowitz, *The First New South: 1865-1920* (Arlington Heights: Harlan Davidson, 1992), esp. 70.

¹¹¹ Scott Marler, *The Merchant's Capital: New Orleans and the Political Economy of the Nineteenth-Century South* (Cambridge: Cambridge University Press, 2015), cf. esp. 257-282.

¹¹² Carlton and Coclanis, *The South*, pp. 73-98.

phosphate industry's place within the Florida and the fertilizer industry's place within the regional economy of the New South.¹¹³ The principal buyers of the fertilizer industry's finished goods (mixed fertilizers) were the Southeastern states of South Carolina, North Carolina, Alabama, Virginia. They purchased the fertilizer made from Florida's phosphate rock to treat their traditionally Southern crops, especially cotton.¹¹⁴ So it was the product of a distinctly modern industry that enabled and prolonged the agricultural production of the traditional southern crops. It was precisely by means of this modern industry that southern farming practices associated with the most repressive and "feudal" characteristics of the South, such as crop liens and sharecropping.¹¹⁵

"Unbalanced growth" refuses the pieties of the equilibrium model of economic growth, instead seeking to understand how markets can reinforce disparities.¹¹⁶ This occurs at different economic scales, from local and regional to global. A highly capitalized core polarizes the surrounding economic areas, drawing resources from them and inhibiting local competition. This becomes a feedback loop, reinforcing the economic dominance of the core. This strongly resembles the concept of "uneven development," developed within Marxist economics and geography. Geographer Neil Smith ties the patterns identified by Carlton to the logic of capital accumulation, which benefits from the polarization created. Capital comes to remake the world

¹¹³ This concept is borrowed by Carlton and Coclanis from the economic writings of Albert Hirschman and Gunnar Myrdal as a means of understanding the ambiguous role of industrialization.

¹¹⁴ FTC, "Report" (1923), 16.

¹¹⁵ A striking parallel to the argument developed in this chapter can be found in William Holmes' "The Southern Farmers Alliance and the Jute Cartel," *Journal of Southern History*, Vol. 60, No. 1 (Feb., 1994), pp. 59-80. Holmes also draws on Chandler to argue that the "jute cartel" was a modern industry whose organizational practices resulted in the impoverishment of farmers. Closer examination of the relationship between the fertilizer industry's monopolization of crucial materials, wholesale pricing and advertising practices and their relationship to the farmers in the period after the populist movement (and the immiseration of Southern farmers more generally) remains necessary. On the Farmers' Alliance see, Connie Lester, *Up from the Mudsills of Hell: The Farmers' Alliance, Populism and Progressive Agriculture in Tennessee, 1870-1915* (Athens and London: The University of Georgia Press, 2007).

¹¹⁶ Carlton, "Revolution from Above," 76.

in its image. Smith writes, “uneven development is social inequality blazoned into the geographical landscape, and it is simultaneously the exploitation of that geographical unevenness for certain socially determined ends.”¹¹⁷

The fertilizer manufacturers themselves played no small role in the misery and indebtedness of Southern farmers and sharecroppers. Fertilizer manufacturers operated a credit system which wracked Southern farmers throughout the period.¹¹⁸ In 1916, for example, the percentage of fertilizers bought by Southern farmers on credit – credit provided by the manufacturers – was between 80% and 90%.¹¹⁹ The FTC described these loans and the conditions of indebtedness of Southern farmers as “incredibly bad.”¹²⁰ Although these numbers decreased slightly, they did so only when fertilizer manufacturers were unable to provide the credit and farmers had to either find the necessary cash or go without. Fertilizer manufacturers also engaged in knowingly deceptive selling practices, disguising brands and operating subsidiaries.¹²¹ Prior to 1916, it was common practice for the fertilizer manufacturers to buy out local sellers but retain their brand and mixtures – profiting, but without alerting the customer of the new ownership. These deceptive selling were decried by the FTC. Manufacturers marketed hundreds of brands whose nutrient ingredients were essentially identical.

Fertilizer manufacturers also aimed to prevent farmers from being able to produce their own fertilizer at an individual level, by pricing fertilizer materials purchased at an individual scale deeply outside of the farmers’ reach, by making wholesale amounts (which were priced more affordably) large beyond the manufacturing scope of the individual farmer (thus, intended

¹¹⁷ Neil Smith, *Uneven Development: Nature, Capital, and the Production of Space*, 3rd edition (Athens: University of Georgia Press, 2010), 154, 206.

¹¹⁸ FTC, “Report,” (1923), 43.

¹¹⁹ *Ibid.*

¹²⁰ FTC, “Report” (1916), 237.

¹²¹ *Ibid.*, XVIII.

exclusively for industry consumption).¹²² Because local and small scale dry-mixing posed the greatest threat to the fertilizer industry at the level of the manufacturers, it was in the interest of producers to ensure that there would be no competition at that point.¹²³ Because the largest fertilizer manufacturers had vertically integrated to include the production of fertilizer materials (far beyond the reach of the individual farmer) they had a created a de facto cartel for controlling the wholesale of that material.

This discrepancy between individual and wholesale prices brings us precisely to the point at which the more abstract economic concerns of the fertilizer industry's operations – its integration, its capital investment, and its cartelization – meet up with concrete historical concerns of the New South: its poverty and backwardness, credit systems, sharecropping, residual “feudal” or pre-capitalist elements. The fertilizer industry (one need only consider that the VCC was headquartered in Richmond) and phosphate mining industries were Southern, yet simultaneously as modern as any big business in the North. But the most distinctively modern of industries not only can coexist with but can create the most distinctively unmodern conditions – as clear a picture of uneven development as can be drawn.

¹²² Ibid., 236.

¹²³ Ibid.

CONCLUSION CONTRADICTIONS OF THE NEW SOUTH

The concept of the “New South” began, essentially, as an advertising slogan.¹ By fostering an image of national unity and regional political stability, the aim of early promoters of the concept was to draw in Northern capital in the decades following Reconstruction, and to provide an ideological salve to a region still reeling from the economic devastation of the war. The concept has been, from its inception, almost deliberately vague, giving it the ability to encompass a number of conflicts and contradictions. The first of these was the projection by boosters of an image of peaceful racial cohesion, which existed alongside actually white racial violence and segregation; boosters argued for economic change that encompassed industrialization and modernization, but this was accompanied by the seemingly backwards agricultural practices used after emancipation, such as sharecropping. Within the historiography of the New South, these themes of racial exclusion and domination come to the fore in discussions of the region’s modernity. Economic modernization relied on segregation and white supremacy, and the converse is also true: the forms of segregation and white supremacy taken during the New South were specifically modern, reliant on urbanization, monopolization of large industries, and a burgeoning consumer culture.² If slavery denied black Southerners the fruits of their labor, the decades following Reconstruction saw them determined to regain them; and white capital was equally determined to again deprive them under new forms of domination.³

¹ C. Vann Woodward, *Origins of the New South, 1877-1913* (Baton Rouge: Louisiana State University Press, 1951), ix.

² On the role of consumer culture in segregation, Grace Hale, *Making Whiteness: The Culture of Segregation in the South, 1890-1940* (New York: Pantheon Books, 1998), esp. Ch. 4.

³ Tera Hunter, *To ‘Joy My Freedom: Southern Black Women’s Lives and Labors after the Civil War* (Cambridge: Harvard University Press, 1982), 22.

It is not that the New South, as a creature of capitalist modernity, became indistinct from the rest of the nation. On the contrary, the contradictions of the New South were in many ways unique, or acute forms of the most difficult aspects of modernization. In stressing its distinctiveness, Woodward emphasizes the role of economic modernization with the exclusionary political regimes of the region; he does not even hesitate to find difficulties at the heart of the Southern populists, noting that white democratic sentiment often coincided with heightened levels racial violence, and that both populism and repression were predicated on the creation of new labor markets and a black “reserve army of labor.”⁴ Woodward and Gaston both stress the role that economic development, and specifically the desire for capital investment, rested behind much booster rhetoric of a resource rich “Opulent South” of cheap and pliant labor.⁵ Tindall gave these themes an even fuller expression, refusing to shy away from the fact that through the 1920s, “Atlanta spirit” boosterism coincided and relied on the cheap labor markets and wage differentials that were created by a perpetually impoverished agriculture and with increasing amounts of tenancy and sharecropping.⁶ Integration into national markets coincided with the rise of “the Savage Ideal,” the violent regionalist and nativist racial ideology enforced throughout the decade.⁷

New South Florida, New South Capitalism

With the phosphate industry the myths and savage ideals of the New South found a striking realization. Florida’s phosphate fields were a rich natural resource, a far more plentiful

⁴ Woodward, *Origins*, 211 and 228-229.

⁵ Gaston, *Myth of the New South*, 87.

⁶ Tindall, *Emergence*, 125, 319-320.

⁷ *Ibid.*, 184.

deposit than those that had been mined decades earlier in South Carolina.⁸ Labor was bought cheaply and remained until the First World War, unorganized. The mining of phosphate rock produced a fertilizer that was widely sold throughout the South, and became essential for the Southern staple crops contributing to King Cotton and the chronic difficulties of Southern agriculture. The mining of phosphate was premised not on the needs of the region, its farmers, or the mine laborers, but on maintaining the strained profitability of an industry that controlled access to these resources. The productivity of the industry was parasitic on its profitability, which in turn faced difficulty with vicious, early industry competition, before stabilizing with the industry's ability after the First World War to control the distribution and pricing of the phosphate and fertilizer through open collusion.⁹ This is characteristic of industrial capitalism, which subordinates production to forms of economic imperatives deriving from the real competition between capitals; between labor and capital (the demand for wages and fewer hours on the one hand, and the attempted control of the labor process by technologically increasing working efficiency on the other) and between differing industries and actors on a broader world market.

The phosphate industry stood at the center of these conflicts, taking part in them and exemplifying them at their most acute. The industry stood at the forefront of modern industrial consolidation at the same time as it enacted segregation in its camps and workforce. Its consolidation into the fertilizer industry provided latter with a crucial component that was then sold to Southern farmers and sharecroppers using deceptive labeling and priced out mid-level competition by integrating the production of fertilizer materials.

⁸ Blakey, *Florida Phosphate Industry*, 47.

⁹ This coincides, too, with Tindall's account of New South, "Atlanta Spirit" boosterism, fading and giving way to an insistence on stability rather than growth leading up to and after the Depression. Tindall, *Emergence of the New South*, 433.

Labor enters this picture of economic competition and control as “pliant” and cheap. Prior to the First World War, union organization in the district had been all but impossible.¹⁰ Even after the union became a presence, meetings were held in secret and employment discrimination was the norm. The dire conditions of the mining camps, particularly the company housing, were plainly the product of Jim Crow segregation. For black workers, as elsewhere in the south, lynching was a looming threat, and Blakey cites “numerous examples of their being hanged, burned at the stake and even drawn and quartered.”¹¹ The first legal execution in Polk County was the hanging in Bartow of a black phosphate worker.¹² The conditions on the job were examined in the first chapter: workers, particularly the unskilled black laborers, were exposed to the harshest conditions, which in the pits were “malaria-infested” and swampy and in the dry bins, unbearably hot.¹³ Ultimately, the social and economic contradictions of modernity played out on the bodies of the workers in the mines. And as the workers struck in 1919, Mine-Mill President Charles Moyer wrote, “no strike has ever been more fully justified than the strike of the Florida Phosphate Workers.”¹⁴

This thesis has argued that an understanding of Florida’s phosphate mines demands the placement of the state and the industry within the context of the New South, and within modernity. I have also argued for a specific concept of modernity, which views the violence and conflict of these decades not as aberrations from a stable process of rationalization, but as intrinsic to the process itself. When modernity came to the South it manifested in a particularly

¹⁰ “Report of International President Moyer,” *Official Proceedings of the Twenty-Third Consecutive and Third Biennial Convention of the International Union of Mine, Mill and Smelter Workers* (Denver: Union of Mine, Mill and Smelter Workers, 1918), 30.

¹¹ Blakey, *Florida Phosphate Industry*, 53.

¹² *Ibid.*

¹³ *Ibid.*

¹⁴ “Strike of Florida Phosphate Workers,” in *Official Proceedings of the Twenty-Fourth Consecutive and Fourth Biennial Convention of the International Union of Mine, Mill and Smelter Workers* (Denver: Union of Mine, Mill and Smelter Workers, 1920), 134.

savage way, due not to the region's "backwardness," but to its adherence to this strange, conflictual logic.¹⁵ I have done so by examining the industry from three, interrelated perspectives, at increasing scales of generality: the characteristic New South difficulties of race and labor are displayed in full force in the first chapter; the fitful adoption of technology and the ferocity of capitalist competition in the second chapter; and the mixture of tremendous outside capital and vertically integrated industry coinciding and regional, rural impoverishment in the third.

¹⁵ Tindall writes of the New South's modernity – once "the genie of modernism was out of the bottle [...] it could not be lured back." Tindall, *Emergence of the New South*, 217.

LIST OF REFERENCES

Primary Sources

- The American Fertilizer*. Ware Bros. Company: Philadelphia, 1900-1924.
- The American Fertilizer Handbook*. Ware Bros. Company: Philadelphia 1905-1922.
- Annual Report of the American Agricultural Chemical Company*. New York: American Agricultural Chemical Co., 1900-1935.
- Annual Report of the Florida State Geological Survey*. Tallahassee: Capital Publishing Co. 1906-1930.
- Barger, Harold and Schurr, Sam. *The Mining Industries, 1899-1939: A Study of Output, Employment, and Productivity*. Washington: Government Printing Office, 1944.
- Bureau of the Census. *Thirteenth Census of the United States Taken in the Year 1910, vol. 11: Mines and Quarries*. Washington: Government Printing Office, 1913.
- . *Fourteenth census of the United States Taken in the Year 1920, vol. 10: Mines and Quarries*. Washington: Government Printing Office, 1923.
- Cash, F. E. *Land Pebble Phosphate Mining in Florida*. Washington: Bureau of Mines, 1924.
- . *Pebble Phosphate Accident Experience*. Washington: Bureau of Mines, 1936.
- The Colliery Engineer*. International Textbook Co.: Scranton, 1912-1920.
- Decisions of the Federal Trade Commission*. Washington: Government Printing Office, 1922 – 1953.
- The Earth Mover: A Monthly Magazine for Earth and Stone Movers*. Aurora: Burton Publishing Co., 1917-1920.
- Engineering News*. New York: The Engineering News Publishing Company. 1900-1917.
- Engineering and Mining Journal*. McGraw-Hill Company: New York, 1900-1923.
- Federal Trade Commission. *Federal Trade Commission Decisions: Findings, Orders and Stipulations*, vol. 42. Washington: Government Printing Office, 1946.
- . *Report on the Fertilizer Industry: August 19, 1916*. Washington: Government Printing Office, 1916.
- . *Report of the Federal Trade Commission on the Fertilizer Industry*. Washington: Government Printing Office, 1923.
- . *Report on International Phosphate Cartels*. Washington: Government Printing Office, 1946.

- The Fertilizer Industry: Letter of the Federal Trade Commission.* Washington D. C.: Government Printing Office, 1916.
- Florida Industrial and Phosphate Research Institute. Bartow, Fl. Website: www.fipr.state.fl.us/
- Fulton, Chester Alan. *Mining Practice in the Florida Pebble Phosphate Field.* New York: American Institute of Mining and Metallurgical Engineers, 1936.
- Gray, A. N. *Phosphates and Superphosphates.* London: International Superphosphate Manufacturer's Association, 1930.
- Haskell, A. Porter and Kiessling, Oscar. *Technology, Employment, and Output per Man in Phosphate-rock Mining, 1880-1937.* Washington: Works Progress Administration, 1938.
- IMC-Agrico Phosphate Company Collection, Special Collections Department, Tampa Library, University of South Florida, Tampa Florida.
- Kantor, Harry. *Changes in Technology and Labor Requirements in the Crushed-Stone Industry.* Washington: Works Progress Administration, 1939
- Industrial Progress.* Milwaukee: Industrial Progress, 1909-1910.
- Jacobs, K. D. *The Composition and Distribution of Phosphate Rock with Special Reference to the United States.* Washington: United States Department of Agriculture, 1933.
- Johnson, Bertrand L. *Phosphate Rock.* Washington D.C.: Bureau of Mines, 1930.
- Kantor, Harry and Saeger, Geoffrey. *Changes in Technology and Labor Requirements in the Crushed-Stone Industry.* Washington: Works Progress Administration, 1938.
- Lawrence, H. S. *Losses of Phosphate in the Land-Pebble District of Florida.* Washington: Bureau of Mines, 1929.
- Lloyd, Strauss L. *Mining and Manufacture of Fertilizing Materials and their Relation to Soils.* New York: D. Van Nostrand Co., 1918.
- Matson, George. *The Phosphate Deposits of Florida.* Washington, D.C.: United States Geological Survey. 1915.
- The Mineral Industry: Its Statistics, Technology and Trade.* McGraw-Hill Company, New York. 1900-1930.
- Mineral Resources of the United States.* Washington, D.C.: United States Geological Survey, 1887-1920.

- Mining and Engineering World*. Chicago: Mining World Company. 1905-1915.
- Moody's Analyses of Investments*. New York: Moody's Investors Service. 1909-1922
- Moody's Manual of Corporation Securities*. New York: John Moody & Co., 1901-1904
- Official Proceedings of the Consecutive and Biennial Convention of the International Union of Mine, Mill and Smelter Workers*. Denver: The Union, 1918-1920.
- Polk County Historical & Genealogical Library. Polk County History Center, Bartow. Website: <http://library.mypclc.org/historical/>
- Records of the National War Labor Board. National Archives, College Park.
- Rock Products*. Chicago: Maclean-Hunter Publishing Corporation, 1902-1922.
- Proceedings of the Engineering Association of the South*. Nashville: The Engineering Association of the South. 1899-1911.
- Waggaman, William. *A Review of the Phosphate Fields of Florida*. Washington D.C.: Government Printing Office, 1911.
- . *Phosphoric Acid, Phosphates and Phosphatic Fertilizers*. 2nd ed. New York: Reinhold Publishing Co, 1952.
- Wyatt, Francis. *The Phosphates of America*. New York: The Scientific Publishing Company. 1891.

Secondary Sources

- Adelman, Jeremy and Levy, Johnathan. "The Fall and Rise of Economic History." *The Chronicle of Higher Education* (Dec. 1, 2014). Accessed March 7, 2016.
- Appleby, Joyce. *The Relentless Revolution: A History of Capitalism*. New York: W.W. Norton, 2011.
- Aglietta, Michel. *A Theory of Capitalist Regulation: The US Experience*. London: NLB, 1979.
- Arnesen, Eric. *Brotherhoods of Color: Black Railroad Workers and the Struggle for Equality*. Cambridge: Harvard University Press, 2001.
- . "Passion and Politics: Race and the Writing of Working-Class History." *The Journal of the Historical Society* 6, no. 3 (Fall 2006): 323-56.
- Arrighi, Giovanni. *The Long Twentieth Century: Money, Power and the Origins of Our Times*.

- London and New York: Verso, 1994, 2nd ed. 2010.
- . "Towards a Theory of Capitalist Crisis." *New Left Review* I, no. 111 (September 1978).
- Anderson, Aaron. *Builders of a New South: Merchants, Capital, and the Remaking of Natchez, 1865-1914*. Jackson: University of Mississippi Press, 2013.
- Ayers, Edward. *The Promise of the New South: Life after Reconstruction*. New York: Oxford University Press, 1992.
- Blackmon, Douglas. *Slavery by Another Name: The Re-Enslavement of Black Americans from the Civil War to World War II*. New York: Doubleday, 2008.
- Blakey, Arch. *The Florida Phosphate Industry: A history of the Development and Use of a Vital Mineral*. Cambridge: Harvard University Press, 1973.
- Braverman, Harry. *Labor and Monopoly Capital: The Degradation of Work in the Twentieth Century*. New York: Monthly Review Press, 1974.
- Burt, Roger. "Innovation or Imitation: Technological Dependency in the Nonferrous American Mining Industry." *Technology and Culture* 41, no. 2 (April 2000): 321-347.
- Carchedi, Guglielmo. *The Frontiers of Political Economy*. New York: Verso Books, 1992.
- Carlton, David L. and Coclanis, Peter A., *The South, the Nation, and the World: Perspectives on Southern Economic Development*. Charlottesville, VA: University of Virginia Press, 2003.
- Carper, Noel Gordon. "The Convict Lease System in Florida 1866-1923." PhD diss., Florida State University, 1964.
- Cassanello, Robert. "'We Are White Men and Haven't Got Black Hearts': Racialized Gender and the Labor Movement in Florida 1900-1920." In *Florida's Working-Class Past: Current Perspectives on Labor, Race and Gender from Spanish Florida to the New Immigration*, edited by Robert Cassanello and Melanie Shell-Weiss. Gainesville: University Press of Florida. 2009.
- Chandler, Alfred. *Scale and Scope: The Dynamics of Industrial Capitalism*. Harvard: Belknap Press, 1990.
- . *The Visible Hand: The Managerial Revolution in American Business*. Cambridge: Harvard University Press, 1977.
- Cmiel, Kenneth. "Destiny and Amnesia: The Vision of Modernity in Robert Wiebe's *The Search for Order*." *Reviews in American History*, Vol. 21, No. 2 (Jun., 1993), pp. 352-368.

- Cobb, James. *Industrialization and Southern Society, 1877-1984*. Lexington: University of Kentucky Press, 1984.
- Cohen, Lizabeth. *Making a New Deal: Industrial Workers in Chicago, 1919-1939*. New York: Cambridge University Press, 1990.
- Cohen, William. *At Freedom's Edge: Black Mobility and the Southern White Quest for Racial Control, 1861-1915*. Baton Rouge: Louisiana State University Press, 1991.
- William Cronon, *Nature's Metropolis: Chicago and the Great West*. New York: W. W. Norton & Co., 1991.
- Dix, Keith. *What's a Coal Miner to Do?: The Mechanization of Coal Mining*. Pittsburgh: University of Pittsburgh Press, 1989.
- Doyle, Don and Shick, Tom. "The South Carolina Phosphate Boom and the Stillbirth of the New South, 1867-1920." *The South Carolina Historical Magazine* 86 (January 1985): 1-31.
- Draper, Alan. "The New Southern Labor History Revisited: The Success of the Mine, and Smelter Workers Union in Birmingham, 1934-1938." *The Journal of Southern History* 62 (February 1996): 87-108.
- Eller, Ronald. *Miners, Millhands, Mountaineers: Industrialization Appalachian South*. University of Tennessee Press, 1982.
- Fields, Barbara J. "Origins of the New South and the Negro Question." *The Journal of Southern History* 67, (Nov. 2001), 811-826.
- . "Whiteness, Racism, and Identity." *International Labor and Working-Class History* 60 (Fall, 2001), pp. 48-56.
- Fishback, Price V. *Soft Coal, Hard Choices: The Economic Welfare of Bituminous Coal Miners, 1890-1930*. Oxford: Oxford University Press, 1992.
- Fisher, James Arthur. "The History of Mulberry and Frontier Florida: A Model For the Teaching of Local History." PhD diss., Middle Tennessee State University, 1974.
- Flamming, Douglas. *Creating the Modern South: Millhands and Managers in Dalton, Georgia 1884-1984*. Chapel Hill: The University of North Carolina Press, 1992.
- Flynt, Wayne. *Cracker Messiah, Governor Sidney J. Catts of Florida*. Baton Rouge: Louisiana State University Press, 1977.
- Gaston, Paul. *The New South Creed: A Study in Southern Mythmaking*. New York: Knopf, 1970.

- Gaventa, John. *Power and Powerlessness: Quiescence & Rebellion in an Appalachian Valley*. Champaign: University of Illinois Press, 1982.
- Giltner, Scott. *Hunting and Fishing in the New South: Black Labor and White Leisure after the Civil War*. Baltimore: The John Hopkins University Press, 2010.
- Gordon, Fon Louise. *Caste & Class: The Black Experience in Arkansas, 1880-1920*. Atlanta: University of Georgia Press, 1995.
- Hale, Grace Elizabeth. *Making Whiteness: The Culture of Segregation in the South, 1890-1940*. New York: Pantheon Books, 1998.
- Halpern, Rick. "Organized Labour, Black Workers and the Twentieth-Century South: The Emerging Revision." *Social History* 19 (October 1994): 359-383.
- Harris, J. William. *Deep Souths: Delta, Piedmont and Sea Island Society in the Age of Segregation*. Baltimore: The John Hopkins University Press, 2001.
- Harris, William. *The Harder We Run: Black Workers Since the Civil War*. New York: Oxford University Press, 1982.
- Harvey, David. *The Limits to Capital*. Rev. ed. London and New York: Verso Books, 2007.
- . "The Fetish of Technology: Causes and Consequences." *Macalester International* 13 (2003): 3-30.
- Williams Haynes, *American Chemical Industry*. New York: Garland, 1983.
- . *Chemical Economics*. New York: D. Van Nostrand, 1933.
- Hill, Herbert. "Myth-Making as Labor History: Herbert Gutman and the United Mine Workers of America." *International Journal of Politics, Culture, and Society* 2 (Winter 1988): 132-200.
- William F. Holmes, "The Southern Farmers' Alliance and the Jute Cartel," *Journal of Southern History*, 60 (1994): 59-80.
- Honey, Michael K. *Southern Labor and Black Civil Rights: Organizing Memphis Workers*. Urbana and Chicago: University of Illinois Press, 1993.
- Heilbroner, Robert. *The Nature and Logic of Capital*. New York and London: W. W. Norton & Co., 1985.
- Hudson, Janet. *Entangled by White Supremacy: Reform in World War I-era South Carolina*. Lexington: University Press of Kentucky, 2009.
- Hunter, Tera. *To 'Joy My Freedom: Southern Black Women's Lives and Labors after the Civil*

- War. Cambridge: Harvard University Press, 1997.
- Jones, William P. *The Tribe of Black Ulysses African American Lumber Workers in the Jim Crow South*. Champaign: University of Illinois Press, 2005.
- Ingalls, Robert. *Urban Vigilantes in the New South: Tampa 1902-1936*. Knoxville: The University of Tennessee Press, 1988.
- Kelley, Robin D. G. *Hammer and Hoe: Alabama Communists during the Great Depression*. Chapel Hill: University of North Carolina Press, 1990.
- Kelly, Brian. *Race, Class and Power in the Alabama Coalfields, 1908-21*. Urbana and Chicago: University of Illinois Press, 2001.
- Kolko, Gabriel. *The Triumph of Conservatism: A Reinterpretation of American History, 1900-1916*. New York: The Free Press, 1963.
- Lamer, Mirko. *The World Fertilizer Economy*. Stanford: Stanford University Press, 1957.
- Lamoreaux, Naomi. *The Great Merger Movement in American Business, 1895-1904*. New York: Cambridge University Press, 1985.
- Lankton, Larry. *Hollowed Ground: Copper Mining and Community Building on Lake Superior 1840s – 1990s*. Detroit: Wayne State University Press, 2011.
- Letwin, Daniel. *The Challenge of Interracial Unionism: Alabama Coal Miners, 1878-1921*. Chapel Hill: The University of North Carolina Press, 1998.
- Lauriault, Robert. "From Can't to Can't: The North Florida Turpentine Camp, 1900-1950." *The Florida Historical Quarterly* 67 (Jan. 1989): 310-28.
- Lewis, W. David. *Sloss Furnaces and the Rise of the Birmingham District: An Industrial Epic*. Tuscaloosa: University of Alabama Press, 1994.
- Levy, Jonathan. *Freaks of Fortune: The Emerging World of Capitalism and Risk in America*. Cambridge: Harvard University Press, 2012.
- Lichtenstein, Alex. *Twice the Work of Free Labor: The Political Economy of Convict Labor in the New South*. London: Verso, 1996.
- Markham, Jesse. *The Fertilizer Industry: Study of an Imperfect Market*. Nashville, Vanderbilt University Press, 1958
- Marler, Scott P. *The Merchants' Capital: New Orleans and the Political Economy of the Nineteenth-Century South*. New York: Cambridge University Press, 2013.

- Joseph McCartin, *Labor's Great War: The Struggle for Industrial Democracy and the Origins of Modern American Labor Relations 1912-1921* (Chapel Hill: The University of North Carolina Press, 1998), 4-6.
- Mancini, Matthew. *One Dies, Get Another: Convict Leasing in the American South, 1866-1928*. Columbia: University of South Carolina Press. 1996.
- McKinley, Shepherd. *Stinking Stones and Rocks of Gold: Phosphate, Fertilizer, and Industrialization in Postbellum South Carolina*. Gainseville: University Press of Florida, 2014.
- McKiven, Henry. *Iron and Steel: Class, Race, and Community in Birmingham, Alabama, 1875-1920*. Chapel Hill: The University of North Carolina Press, 1995.
- Miller, Viven. *Hard Labor and Hard Time: Florida's "Sunshine Prison" and Chain Gangs*. Gainseville: University of Florida Press. 2012.
- Mokyr, Joel. *The Lever of Riches: Technological Creativity and Economic Progress*. Oxford: Oxford University Press, 1990.
- Montgomery, David. *The Fall of the House of Labor: The Workplace, the State, and American Labor Activism, 1865-1925*. Cambridge: Cambridge University Press, 1987
- Nelson, Wallace Martin. "Economic development of Florida, 1870-1930." PhD diss., University of Florida, 1962.
- Noble, David. *Forces of Production: A Social History of Industrial Automation*. Oxford: Oxford University Press, 1984.
- Ortiz, Paul. *Emancipation Betrayed: The Hidden History of Black Organizing and White Violence in Florida from Reconstruction to the Bloody Election of 1920*. Berkeley. University of California Press. 2005.
- Portelli, Alessandro. *They Say in Harlan County: An Oral History*. New York: Oxford University Press, 2011.
- Postone, Moishe. *Time, Labor and Social Domination: A Re-Interpretation of Marx's Critical Theory*. Cambridge: Cambridge University Press, 1996.
- Rabinowitz, Howard. *The First New South: 1865-1920*. Arlington Heights: Harlan-Davidson, 1992.
- Ransom, Roger and Sutch, Richard. *One Kind of Freedom: The Economic Consequences of Emancipation*. 2nd ed. New York: Cambridge University Press, 2001.

- Robertson, David Brian. *Capital, Labor, & State: The Battle for American Labor Markets from the Civil War to the New Deal*. Lanham: Rowman & Littlefield, 2000.
- Roediger, David. *The Wages of Whiteness: Race and the Making of the American Working Class*. New York and London: Verso Books, 1991.
- Schumpeter, Joseph. *Capitalism, Socialism and Democracy*. 3rd ed. London and New York: Routledge, 1994.
- Bruce J. Schulman. *From Cotton Belt to Sunbelt: Federal Policy, Economic Development & the Transformation of the South, 1938-1980*. Durham: Duke University Press, 2007.
- Scranton, Philip. *Figured Tapestry: Production, Markets and Power in Philadelphia Textiles, 1855-1941*. Cambridge: Cambridge University Press, 1989.
- . “The Workplace, Technology and Theory in American Labor History.” *International Labor and Working-Class History* 35 (Spring, 1989): 3-22.
- Silkenat, David. “‘Hard Times Is the Cry’: Debt in Populist Thought in North Carolina” in *Populism in the South Revisited*, ed. by James M. Beeby, pp. 101-127.
- Shaikh, Anwar. *Capitalism: Competition, Conflict, Crises*. Oxford: Oxford University Press, 2016.
- . “Political Economy and Capitalism: Notes on Dobb's Theory of Crisis.” *Cambridge Journal of Economics* 2 (June 1978): 233-251.
- Shofner, Jerrel H. “Florida and the Black Migration.” *Florida Historical Quarterly* 57 (January 1979): 267 – 88.
- . *Nor Is It Over Yet: Florida in the Era of Reconstruction, 1863–1877*. Gainesville: University Presses of Florida, 1974.
- Silver, Beverly. *Forces of Labor: Workers' Movements and Globalization since 1870*. New York: Cambridge University Press, 2003.
- Singal, Daniel Joseph. *The War Within: From Victorian to Modernist Thought in the South, 1919-1945*. Chapel Hill: The University of North Carolina Press, 1982.
- Smith, Neil. *Uneven Development: Nature, Capital, and the Production of Space*, 3rd edition. Athens: University of Georgia Press, 2010.
- Stronge, William. *The Sunshine Economy: An Economic History of Florida since the Civil War*. Gainesville: University Press of Florida, 2008.
- Tindall, George Brown. *The Emergence of the New South, 1913-1945*. Baton Rouge: Louisiana State University Press, 1967.

- Trotter, Joe William. *Coal, Class, and Color: Blacks in Southern West Virginia, 1915-32*. Urbana: University of Illinois Press, 1990.
- Vaughan Jr., Camp. "The Phosphate Industry in Florida: A Statistical Study, 1888-1946." PhD diss., University of North Carolina, 1950.
- Veblen, Thorstein. *The Theory of Business Enterprise*. New York: Scribner's and Sons, 1904.
- Wallerstein, Immanuel. *World-Systems Analysis: An Introduction*. Durham: Duke University Press, 2004.
- . *The Capitalist World-Economy*. Cambridge: Cambridge University Press, 1979.
- . *Historical Capitalism*. New York and London: Verso Books, 1983.
- Weeks, John. *Capital and Exploitation*. New York: Princeton University Press, 1981.
- . *Capital, Exploitation and Economic Crisis*. New York: Routledge, 2010.
- Woodrum, Robert. *"Everybody Was Black Down There": Race and Industrial Change in the Alabama Coalfields*. Athens: The University of Georgia Press, 2007.
- Woodward, C. Vann. *Origins of the New South, 1877-1913*. Baton Rouge: Louisiana State University Press, 1951.
- . *The Strange Career of Jim Crow*. New York: Oxford University Press, 1974.
- Wiebe, Robert. *The Search for Order 1877-1920*. New York: Hill and Wang, 1967.
- Wilkins, Mira. *Foreign Enterprise in Florida: The Impact of Non-U.S. Direct Investment*. Miami: University Presses of Florida, 1979.
- . *The History of Foreign Investment in the United States, 1914-1945*. Cambridge: Harvard University Press, 2004.
- Wright, Gavin. *Old South, New South: Revolutions in the Southern Economy since the Civil War*. New York: Basic Books, 1986.
- . *Sharing the Prize: The Economics of the Civil Rights Revolution in the American South*. Harvard: Harvard University Press, 2013.
- Wyman, Mark. *Hard Rock Epic: Western Miners and the Industrial Revolution, 1860-1910*. Berkeley and Los Angeles: University of California Press, 1979.