

Intermodal Transportation in Historical Perspective

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INTRODUCTION – MODALISM AND INTERMODALISM

Intermodal transportation as the term is used today first gained currency in the 1960s when the use of trailer-sized containers began transforming the way freight is packed and loaded on trucks and ships.¹ Cargoes had of course been transferred between different modes of transportation long before the introduction of modern containers. A number of arrangements for carrying truck trailers piggy-back on flatcars and for moving loaded boxcars overseas on ships had been established, but for the most part the task of shifting cargoes between modes still required that the boxes, barrels and bags in which goods were packed be unloaded from one carrier and then reloaded on the train, ship or truck that would carry them on the next leg of their journey. This slow, laborious process had changed little over time and was only partially mechanized by the mid-1950s, when modern containerization was first introduced. Given this level of disjunction between modes, freight transportation has normally been described in terms of the separate modes employed rather than by the activities at the interface between modes. Transportation was about the different 'ways', vehicles and sources of

1. See David R. McKenzie, et al., *Intermodal Transportation – The Whole Story* (Omaha, Nebraska: Simmons-Boardman Books, 1989), p.7: "The container certainly deserves the credit for focusing attention on intermodalism." The idea of using standard-sized cargo containers and attempts to coordinate road-rail shipments of less-than-carload-lots predate the introduction of the kind and size of containers that are so widely employed today.

power used to move cargoes from one location to another; it was not about shifting cargoes from one mode to another.

By the mid-1970s truck-trailer-sized containers were becoming the standard cargo boxes for surface freight transportation. By the end of the twentieth century containers were carrying over 95% of general cargoes moving between continents and the percentage of other cargoes carried in containers was steadily increasing as well. The circulation of millions of containers worldwide focused attention on two problems: 1) determining which modes to use when moving containerized cargoes, and 2) minimizing the time and expense of shifting containers between modes. The rapid growth of containerization amplified the importance of these core concerns. The enormous capital costs of containers and the equipment used to handle them, combined with intense competition for cargoes, kept profit margins slim while forcing constant innovation. Cities, states and regions made large infrastructure investments in containerports and other intermodal facilities as they struggled to remain players in an industry that was simultaneously expanding and consolidating. The triumph of containerization has irreversibly shifted the focus of freight transportation from modalism to intermodalism. But whether 'intermodalism' is precisely the right label for the contemporary freight transportation industry remains an open question.

Using the term intermodalism to refer to freight transportation in general tends to perpetuate the view that the industry is fundamentally composed of modes whose differences are more important than their common concerns. This perception prevailed during the first 60 years of the twentieth century, but today emphasizing the differences between the modes seems rather archaic given that the industry is rapidly transforming itself into a highly integrated system. During most of the nineteenth and twentieth centuries the different modes of transportation carried goods largely on their own terms. Steamship lines, for example, told their customers to leave their cargo at a dockside warehouse or on the dock. It would then be loaded aboard ship and carried to the designated port, where it would be offloaded to the dock or a warehouse to await pick-up, all according to rates and specifications detailed on a separate manifest.

Containerization has profoundly changed this incremental conception of transportation. Through shipment from origin to destination is now emphasized, not the movement of goods by a series of independent modal carriers. The use of common containers is transforming the different modes into a seamless network that moves freight from its origin to its destination with unprecedented speed and efficiency. Shippers now think of transportation as a service that, like all other components of a company's supply chain, needs to be integrated into the firm's overall operations. Carriers no longer think of themselves as operating in a single

mode. Service is king in the transformed world of freight transportation and the term intermodalism, which originally directed attention to modal operations and modal interfaces, needs to be replaced by a more global term that emphasizes continuity and through service. Of course a mere change of names will not solve the daunting technical and managerial problems encountered in providing reliable, swift, efficient transportation by a network of carriers, but a more comprehensive term – the leading candidate appears to be logistics – would more accurately describe the nature of the system that is currently being constructed.

If in the future intermodalism is replaced as the organizing concept for freight transportation by some term that does a better job of capturing the contemporary emphasis on continuity and service, modalism will nonetheless continue to play an important role in the history of transportation. Transportation's heritage, as enshrined in history books and journals, in museum collections and exhibits, and in associations of dedicated amateurs, is thoroughly modal. Maritime historians seldom have much to say to railroad historians, and those who know a great deal about pioneering highway programs and early automobiles and motor trucks rarely have more than a passing knowledge of commercial aviation. Such monomodal identification is not surprising nor should it be condemned, for historians characteristically back into the future with their eyes fixed firmly on the past. But recognizing that the history of transportation remains adamantly modal while the contemporary industry is struggling to reorganize itself into a comprehensive system helps explain why no serious attempt has yet been made to reinterpret the history of surface freight transportation in a way that moves beyond the vocabulary of modalism. A few well-documented books and articles on containerization and intermodalism have been published, but they are primarily valuable as accounts of the attempts to stretch one mode, in most cases rail transport, to encompass another, usually road transport.² But if the history of transportation is to stay in touch with contemporary developments it will have to come to grips with intermodalism at the conceptual level. Change in the present creates pressure to reexamine older accounts of the past; that's what drives historians back to their sources and justifies the construction of new interpretations of the past. It is time that historians of transportation begin thinking outside the modal box.

2. See David DeBoer's excellent *Piggyback and Containers: A History of Rail Intermodalism on America's Steel Highway* (San Marino, California: Golden West Books, 1992); John H. White, Jr., "The Magic Box: Genesis of the Container," *Railroad History*, v.158 (1987), pp. 72-94; historical material in Gerhardt Muller, *Intermodal Freight Transportation*, 4th ed. (Washington, DC: Eno Transportation Foundation and the Intermodal Association of North America, 1999); and Andrew Gibson and Arthur Donovan, *The Abandoned Ocean: A History of United States Maritime Policy*, (Columbia, SC: University of South Carolina Press, 2000), pp. 209-225. Donovan and Gibson are also writing a history of the container revolution.

This paper suggests one way in which the history of surface freight transportation might be recast so as to link the past to the present in a more convincing manner. Forty years of intermodalism has shown it is possible to think of freight transportation without forcing the subject into modal categories. Conceptually, this is one of intermodalism's enduring achievements and it deserves to be given a prominent place in historical accounts of twentieth-century transportation. But having broken the mold of modalism, intermodalism may have done all the work it can in today's transportation industry. I suggest that like other once useful organizing ideas in transportation history, ideas such as mercantilism and grants of public lands, the concept of intermodalism be honorably retired. The freight transportation industry can then shed its outdated fixation on modes and move more confidently into the beckoning post-modal future.

The different modes employed in moving freight are human inventions, rather than systems whose defining characteristics are given by nature or their technologies, and each of the modes has its own history. The historical sequence in which the different modes appeared and the ways they have intersected and interacted over time go a long way toward explaining why modal separation and competition have so long been considered fundamental to freight transportation. Our first task, therefore, is to examine more closely how the modal perception of transportation arose and achieved intellectual dominance. We need to think of the modal conception of transportation as contingent and problematic rather than given. Before asking how modalism was transformed into intermodalism, we need to understand how modalism itself gained ascendancy. This is a question that would not have arisen had containerization not forced all those engaged in freight transportation to pay more attention to intermodalism. Once again we see how recent developments recast the questions historians ask and keep the study of the past alive and interesting.

A comparison may help clarify what is being proposed. Modern nation-states, like the various modes of transportation, are historical entities; their points of origin can be identified and how they have developed over time can be explained. For centuries in Europe, and for different periods of time elsewhere, nation-states have been the atomic units of world politics. States are traditionally regarded as autonomous and sovereign; there is no higher secular authority to which they must answer. So long as the world has been divided geographically and politically into sovereign nation-states, the power of more general councils that seek to address regional and global issues has been severely limited, the most notable contemporary example being the United Nations. While diplomats employing the protocols of international relations do succeed in arranging alliances and other forms of agreement among states, in the

modern state system no state willingly surrenders its fundamental freedom of action.

Today, however, the concept of national sovereignty is slowly and steadily being transformed. Global commerce and communications, and the development of regional trade agreements in Europe and North America, are in fact reducing the freedom of action of the nations involved. We may be witnessing the end of the nation-state as the irreducible sovereign unit in world politics, just as in transportation the various modes can no longer function with complete autonomy. The benefits that flow from trade and industrial efficiency are persuading political leaders that they must be prepared to bargain away aspects of their independence so they can share in the wealth available to members of larger economic communities. No one knows precisely where these trends are taking us, but in transportation, as in world politics, it appears that new and very different attitudes and organizations are gaining ascendancy. Internationalism and intermodalism prepared the way for profound institutional changes that now sustain new forms of political and industrial coordination on a global scale. New forms of self-description will seem natural to those who come to maturity in this new world, while only historians and those who worked in the transportation industry before containerization and deregulation will continue to be aware that a profound cultural and institutional shift has taken place. Today a history of the world that focuses entirely on the rise and fall of nation-states would rightly be considered inadequate. So would a history of transportation that speaks only of modes and their interactions.

FREIGHT TRANSPORTATION BEFORE THE AGE OF MODALISM

Modern freight transportation uses machines, natural resources and human skills to move cargoes over considerable distances. Because each of the different modes employs a different mix of technologies, each has its own characteristics and capabilities. In certain circumstances two or more modes may compete head-to-head for cargoes awaiting shipment, but in most cases there is, for technical and economic reasons, little direct competition between modes. Rails simply cannot be built across oceans, while airplanes are not competitive when it comes to moving low-value commodities. Intermodalism addresses the problem of selecting the best mode of transport when more than one mode can or must be utilized. It also deals with the physical transfer of cargoes from one mode to another. In historical terms, however, significant modal competition is largely a modern phenomenon, one that only became a matter of some importance following the mechanization of overland transport.

Freight is heavy and the vehicles in which it is loaded must be

strongly supported while offering relatively little resistance to horizontal motion. When distinguishing among the modes it is therefore best to begin by focusing on the 'way' used by each mode. Prior to the industrial revolution most overland carriage relied on animal power to carry the weight of the goods being transported and to move them forward. Certain devices, such as rowed galleys and wheeled wagons, used inanimate means to support the vehicle's weight as it was propelled forward by muscle power, but the tempestuousness of the seas and the roughness of roads built before the twentieth century severely limited their utilization. Two of the industrial revolution's great achievements were the manufacture of compact and increasingly efficient steam engines and the production of large quantities of relatively low-cost iron, and both technologies contributed to profound advances in freight transportation. In the twentieth century further technological advances added to the ways available to move freight, so that today one can choose among waterways, railways, highways, and airways, as well as such less flexible but nonetheless important modes as pipeways and beltways.

Waterways have been used to move freight since time immemorial. Peoples who lived along rivers learned to build rafts and canoes, load them with trade goods, and float them downstream. The water supported the weight of the cargo, so long as the vessel stayed afloat, while offering little resistance to motion along its surface. In time humans learned to make larger and stronger boats and use sails to capture the force of the wind. Wherever water passage was possible on rivers, along coasts, in enclosed bays and seas, and ultimately across oceans, the evolving technologies of shipbuilding and sailhandling made it possible to carry men and goods to lands both near and far. Later on waterways were extended inland by constructing canals. A variety of industries arose to exploit the possibilities made available by different types of waterways, but they were all part of a single mode in the sense that they all used water as their 'way'.

In an abstract sense coastal navigation competed with overland transportation, but as Adam Smith emphasized in *The Wealth of Nations*, so long as overland transport depended on highways and draft animals, there really was no competition. Writing in the 1770s Smith examined the cost of moving freight between London and Edinburgh, a city served by the port of Leith.

A broad-wheeled wagon, attended by two men, and drawn by eight horses, in about six weeks time carries and brings back between London and Edinburgh near four ton weight of goods. In about the same time a ship navigated by six or eight men, and sailing between the ports of London and Leith, frequently carries and brings back two hundred ton weight of goods.

After working out the relative costs involved, Smith concludes:

Were there no other communication between those two places, therefore, but by land-carriage, as no goods could be transported from the one to the other, except such whose price was very considerable in proportion to their weight, they could carry on but a small part of that commerce which at present subsists between them, and consequently could give but a small part of that encouragement which they at present mutually afford to each other's industry.³

Smith then extends his argument to regions in which overland carriage is not possible, his point being that in the absence of reasonably priced transportation, or of any form of transportation at all, there is no trade. This was the vision that informed the age of European maritime empires from the mid-fifteenth century until the end of the Second World War. At that stage in the history of transportation, the growth of trade was promoted and shaped far more by the possibilities opened up by new modes of transportation than by marginal advantages among competing modes.

The railroad was the new way to go in the nineteenth century. The 'way' involved was manmade, the key technology was the flanged iron wheel rolling on an iron rail. Metal rails support the weight of vehicles and cargo while imposing far less resistance to horizontal motion than the rough highway surfaces of the time. In North America two types of railroads were built. The earliest connected existing cities and towns and carried passengers and freight in both directions. These roads were often built parallel to existing canal routes and turnpikes and in most cases offered faster, cheaper and more reliable service than the canals or roads could provide. Here, as along the coasts, real modal competition emerged, and in all but a few cases the railroads prevailed. But railroads were also built, usually with government land-grant support, from cities and towns 'at the end of the line' out onto the open prairies and plains and up into the mountains. The companies that built these roads were betting on the future and trusting that commerce would flourish once the continent's mountain ranges had been breached and its interior had been settled and made productive. In one sense then, the pioneering age of railroading was the continental equivalent of the classic age of European maritime enterprise. When a means had been found to provide fast, efficient overland freight transportation, commerce expanded to make full use of its possibilities.⁴

3. Adam Smith, *An Enquiry into the Nature and Causes of the Wealth of Nations* (Oxford: Oxford University Press, 1976), pp. 32-33.

4. James E. Vance, *The North American Railroad* (Baltimore: Johns Hopkins University Press, 1995).

But there were also profound differences between waterways and railways. With the exception of canals and improvements needed to make rivers and harbors navigable, the waterways used by the maritime industries were provided by nature at no cost. And so long as ships continued to harness the winds, the power that propelled them was available free of charge. Of course this reliance on nature made maritime commerce dependent on the weather in all its variability, but the salient point is that the comparative entry and operating costs of water transport remained low. Furthermore, ships could go wherever their capabilities and economic opportunities took them; ocean-going ships could look for cargoes and markets wherever they could sail, so long as pirates and politicians did not pillage or exclude them. The low cost of entry in the maritime trades and the flexibility and range of coastwise and oceanic commerce were of great use to North Americans in their colonial and early national periods, and they made the most of them.

When railway development began in the 1830s, America was a thinly settled nation with relatively little capital to invest in its infrastructure and railroad building was therefore left to private enterprise. The captains of industry who took the lead in this new mode of transportation, many of whom would later be pilloried as 'Robber Barons,' built the overland transportation system that created modern America. The cost of doing so was enormous. Railroad companies had to acquire rights of way, construct road beds, and lay the tracks on which their trains ran. Land costs, building costs, and the maintenance and operating costs of the ways themselves obliged the railroads to raise capital at levels never before required by American private enterprise. British investors provided a large portion of the needed funds, while America's capital markets were rapidly mobilized to support the building of the new nation's transportation infrastructure. Overbuilding, ruinous competition, bankruptcy and consolidation roiled the railroad industry until the end of the nineteenth century as the national rail network was being constructed and the great railroad companies were figuring out how to manage America's first big business.⁵ It was a story of epic proportions, one that largely obliterated from national memory the earlier, less capital-intensive achievements of America's maritime industries.

The fact that the railroads, unlike the maritime carriers, built and owned their 'ways' was enormously important. Once the first wave of railway building had been completed, comprehensive railroad companies were created largely by buying and integrating smaller companies that

5. See Alfred D. Chandler, Jr. ed., *The Railroads: The Nation's First Big Business* (New York, 1965); Alfred D. Chandler, Jr., *The Visible Hand - The Managerial Revolution in American Business* (Cambridge, Mass.: Harvard University Press, 1977), chapters 3-6.

owned key segments of track on developed routes. In the maritime trades, at least before the age of iron ships, those who wished to enter the business could simply build new vessels at relatively low cost and bid for cargoes wherever they were allowed to trade. The railroads had huge sunk costs, and opening a new route or abandoning an old one involved significant commitments or losses. While the railroads wielded great power over the towns and regions they served and could claim a large percentage of the commercial wealth generated within them, their geographical fixedness made them easy political targets, especially when they were popularly viewed as being rapacious monopolies. The railroads' size and power exposed them to far greater public scrutiny and political interference than the waterway's industries had to face. As a result, it was the railroad companies rather than the maritime industries that forced Americans to come to grips with the consequences of relying on private corporations to build and operate the burgeoning national economy's transportation infrastructure.

But it would be a mistake to suppose that the great railroad builders thought of themselves as restricted to one mode only. Although widely known for their successes as captains of the railroad industry, many of the pioneering railroad managers thought of themselves as entrepreneurs in the broadest sense and were ready to expand into any form of transportation that offered a promising return. The model for this kind of heroic system building was one of Great Britain's most notable engineers, Isambard Kingdom Brunel.⁶

In 1833, when only 27 years old, Brunel was appointed engineer to the recently formed Great Western Railway Company. Railroad building was then in its infancy and the British had not yet agreed upon a standard track gauge. Brunel decided to build 'broad gauge' on the fairly level run from London to the western port of Bristol and he laid his tracks 7 feet, one-half inch apart. When later in the century he was forced to conform to the 4 foot, 8.5 inches gauge that had become widely adopted as the standard, Brunel considered containerizing rail freight to facilitate shifting it between cars running on different gauges. While building the Great Western Railway Brunel began thinking about steam navigation, and even before 1841, the year the railway was completed, the company had agreed to build trans-Atlantic steamships that would make the western terminus of the railroad New York City rather than Bristol. The first of these, the *Great Western*, was a paddle-wheeled steam auxiliary having an immensely strong wooden hull; on its maiden voyage in 1838 it crossed the Atlantic in 15 days. The second ship, the *Great Britain*, had an iron hull and a screw propeller; it was launched in 1843 and can be seen today

6. Richard Tames, *Isambard Kingdom Brunel, 1806-1859* (Aylesbury, UK:1972).

gloriously restored in the Bristol drydock in which it was built. The third in this series was the mammoth and troubled *Great Eastern*, designed to circumnavigate the globe without refueling and to carry an entire year's exports to India; it was finally launched in 1858. These ships were built to connect Britain's railroads to the world; they were products of a vision of transportation that was not constrained by modal thinking or modal regulation.

Similar stories can be found in the history of American railroading. The Pennsylvania Railroad was organized in 1844 to cross the mountains in the middle of the state and link the eastern seaport of Philadelphia to the booming industrial city of Pittsburgh, located at the head of the Ohio-Mississippi River system.⁷ Much of the railroad's capital came from Philadelphia merchants who had succeeded in maritime ventures, and it was realized that the best way to increase the railroad's traffic flow was to improve Philadelphia's standing as a seaport. This was first done by expanding the trade in anthracite coal brought down from the hills to the west of Philadelphia. In 1850 the Pennsylvania Railroad's west-bound traffic received a boost when Great Britain's Inman Steamship Company began bringing immigrants from Liverpool to Philadelphia. By that time J. Edgar Thompson had become the railroad's president and was vigorously consolidating his control while expanding his vision. By 1870 the railroad had grown from the 400 miles of track connecting Philadelphia to Pittsburgh into a 6000-mile network linking the northeast to the midwest. As Thompson looked east he saw the ocean as a resource to be utilized rather than as a barrier to growth; the time had come, he decided, to move offshore.

New York City had for decades been the dominant seaport on the Atlantic Coast, and after the Civil War it appeared ready to capture nearly all the north-Atlantic trade and funnel it onto the rail system that linked the seaport and the midwest; indeed, seven years after inaugurating its Philadelphia service, the Inman Line had shifted that service to New York. In 1871 the leaders of the Pennsylvania Railroad, together with other prominent Philadelphia merchants and bankers, moved to counter New York's hegemony by creating the American Steamship Company, the nation's first post-Civil War transatlantic liner service. By the end of the year the company was soliciting bids to build four iron steamships the size and speed of the finest British liners in service at that time. This was the largest American steamship order placed in the 1870s and all four shipbuilders in the Delaware Valley, the center of iron shipbuilding in the United States at that time, submitted bids. The contract

7. Thomas R. Heinrich, *Ships for the Seven Seas: Philadelphia Shipbuilding in the Age of Industrial Capitalism* (Baltimore: Johns Hopkins University Press, 1997), pp.55-68.

was awarded to Cramp & Sons and the *Pennsylvania*, the first of the four liners to be built, was launched in 1872. Two years later all four ships were in service and the Philadelphia waterfront was being transformed by their coming and going. These ships, which were not the company's only maritime ventures, served the Pennsylvania Railroad and the city for over 35 years, a clear demonstration that the vision of nineteenth-century transportation leaders was not restricted to a single mode.

The pattern was repeated on the Pacific Coast. James J. Hill got his start working on Mississippi River packets and then ran a steamboat service on the Red River in the 1870s before gaining control of a railroad system centered on St. Paul, Minnesota.⁸ As president of the Great Northern Railway Company he opened much of the Northwest and pushed his line through to Seattle in 1893. Looking north, he saw the Canadian Pacific Railway operating its *Empress* liners from Vancouver to the Orient, while in Tacoma to the south his main American rival, the Northern Pacific Railway, connected with the trans-Pacific service operated by the Northern Pacific Steamship Company. Hill promptly sent agents to Japan and China for a year to compile a detailed record of ship and cargo movements. In 1896 he sent a trusted associate to Japan to sign an agreement with the leading Japanese shipping company, Nippon Yusen Kaisha (NYK), to provide monthly service between Seattle, Hong Kong and Japanese ports for traffic generated by the Great Northern Railway. The first Japanese ship arrived in Seattle a month after the agreement was signed.

Hill saw the Orient as an boundless market for American goods that his railway would carry to Pacific ports; he believed he held the link between America's limitless ability to produce wheat, cotton, and steel and the nations that needed them. Like Brunel, he wanted to operate the biggest ships possible to keep his transportation costs to a minimum. In 1900 he proposed to build four ships for the Great Northern Steamship Company, his new liner company, and signed contracts for the only two that were actually built; both were to be half-again as large as the biggest merchant ship ever built in the United States and larger than any ship in the world operating at that time. They were constructed in Groton, Connecticut, on the site now occupied by the submarine builder Electric Boat Company. Wide, deep, blunt and slow, his ships were designed to produce profits by moving enormous cargoes. It took longer to build them than Hill expected and by the time the *Minnesota* was launched in 1904 Hill was growing weary. As he told a Merchant Marine Commission in 1905, the steamship company "is really an incident to our railroad enterprise,

8. W. Kaye Lamb, "The Trans-Pacific Venture of James J. Hill," *The American Neptune*, v.3, July 1943, pp.185-204.

and we did not go into it with a view of entering the shipping business.” Hill clearly thought of himself as operating in the transportation industry rather than in a single mode, but experience taught him that American shipbuilding was one aspect of the industry he would do well to avoid. As he told the Commission, “I would rather undertake to build a thousand miles of railway than to build two ships.”⁹

These brief stories make a single important point: in the nineteenth-century transportation system builders did not think in terms of modes, they thought in terms of markets, traffic flows and costs. Of course these entrepreneurs knew precisely what the differences were between the two major modes used to move freight, but they all thought of the enterprises they were building as coordinated multimodal systems. It did not occur to them to restrict their thinking to a single mode, especially when opportunities for opening new markets abounded; modal thinking was a constraint that had to be imposed, learned and enforced. If for venturesome entrepreneurs there is a ‘natural’ approach to freight transportation, it is comprehensively systematic rather than modal. There must therefore be particular historical reasons that the transportation industry came to be thought of in modal terms. Modal thinking is not a simple reflection of the existence of several modes, it is a consequence of specific legal limitations and operational practices that were adopted as the American political system responded to the challenges posed by the new forms of transportation made possible by the advance of industry. The rise of modalism is not a simple story, but it is an important and instructive one.

FEDERAL INTERVENTION AND THE CONSTRUCTION OF MODALISM: REGULATION, MOBILIZATION, DEPRESSION

Although the story of federal transportation regulation from the 1880s through the 1930s is exceedingly complex, certain overarching themes are visible. One theme is that during this period legislative acts restricting certain forms of competition and system building within the freight transportation industry had the effect of transforming maritime shipping, the railroads and the motor truck industry from private entrepreneurial enterprises into closely regulated quasi-public utilities. In the decades before the First World War the federal government responded to citizen complaints about the growing power of corporations by setting itself up as a countervailing force responsible for defending the public interest, which of course it then had to define and find suitable means to defend. What emerged from this crusade was a web of bureaucratized intervention and supervision that radically altered the way the regulated industries ran their businesses.

9. *Ibid.*, p.192.

The government responded especially strongly to public dismay over the growth of combinations and trusts. Businessmen promoted such combinations as a way of controlling excess capacity and coordinating supply and demand in the emerging national economy; consumers and small businessmen, however, saw such combinations as monopolies and restraints on trade, conspiracies against the common good. Except in times of national emergency, federal officials seldom argued for public ownership and operation of industry, which industrialists were of course determined to avoid, but gradually regulatory strategies were developed for managing what came to be called 'natural monopolies' as public utilities. Although close regulation of such businesses was widely favored, no one foresaw that the forms of regulation adopted would so constrain the industries involved that their innovative and dynamic features, which everyone expected would continue to generate wealth and increased efficiency, would in fact be effectively destroyed. As the federal government responded to the new world of industry, Americans began to learn through experience the limitations of Progressive social theory and the costs of attempts to link closely political interests and economic activity.

The story of regulation and antitrust enforcement rings with righteous antagonism, misunderstanding, mistrust, unintended consequences, and striking ironies, and although passions ran high for generations, the time for searching for villains has long passed. The government's efforts to control the impact of industry led to bureaucratization and a loss of entrepreneurial vigor, yet its concerns also reflected real public pain and anxiety, and the regulatory machinery it created appeared reasonable at the time. The government was responding to particular problems associated with the growth of industry, it was not attempting to create a comprehensive plan for national economic development. Laws were passed and administrative machinery was created to deal with concrete problems and it took years for all the consequences of these actions to become apparent. Inevitably government regulation slowed the growth and modernization of the regulated industries. In the freight transportation industry, for instance, the government identified problems and proposed remedies on a mode-by-mode basis, a strategy that soon saddled the regulators with the task of rationalizing and sustaining each mode separately. The move from seeing a variety of modes as merely a feature of freight transportation to seeing modalism as the organizing principle of the industry occurred between the 1880s and the 1930s. The government did not set out to create bureaucratic walls between the various modes, but its policies nonetheless had this effect.

Federal regulations addressed a variety of concerns, many of which were widely shared and not causes of contention. The least contentious issues concerned the safety of passengers and, later, of workers. Ship

wrecks, boiler explosions, train wrecks, fires, and highway collisions were dramatic events that managers could hardly excuse as acts of god and there was little political opposition to regulations designed to reduce the loss of life and limb in the increasingly mechanical modes of transportation being employed. Laws designed to prevent and punish dishonest dealings in corporate governance and in the trading of railway securities were also popular, and while only a few Americans owned stocks, legal pursuit of buccaneers who exploited investors and ruined companies was always well received.

The task of controlling the way businesses priced their goods and services and managed their day-to-day affairs was a more challenging matter. The problem generally did not arise when freight was being moved on waterways, for if American ships were allowed to call at a port, new entrants could always provide additional service when rising rates justified doing so. After the First World War this was also true for the motor truck industry, for the roads and highways it used were publicly built and maintained. But as canals and railways pushed west, towns grew up along them like pearls on a string, and in the absence of competing transportation services there was a strong temptation to price the services provided to those towns at whatever the market would bear. But since the products shipped from these areas had to compete in regional and national markets with products from areas where competition kept freight rates low, shippers who were charged high rates complained they were being exploited by the carriers. Here was a challenge to fairness that Congress was eventually forced to confront; the response that emerged addressed both monopoly power and the setting of freight rates.

The constitution gives the federal government sole authority over interstate commerce and this was the power Congress invoked when it took up the issue of railroad freight rates. Setting the rates that customers are charged for service is a matter of crucial importance to businesses. The costs of providing service and the opportunities presented by the marketplace must be taken into account. Congress was concerned primarily with the fairness of rates, but it lacked the information needed to determine what rates should be. It therefore decided to create a panel of experts modeled on the commissions that had previously been set up by several states to regulate railway rates. The Act to Regulate Commerce, passed in 1887, created the Interstate Commerce Commission (ICC), the first of the many federal commissions that were to follow. The Act granted the ICC quite restricted powers, but as shipper complaints increased and the Progressives became more assured of their ability to regulate business, Congress strengthened the ICC's hand. A series of laws passed in the years before the First World War gave the ICC authority to set new rates after voiding unfair rates, to initiate proceedings on its own and set aside

rates temporarily while investigating their fairness, and to establish the physical value of railroad property as a base for calculating a fair level of earnings.¹⁰

The government, through the ICC, had established a firm grip on the railroad industry's ability to generate revenue and it showed no inclination to let go. Appeals to the Commission for rate increases were repeatedly denied on the ground that the railroads could get by with the existing rates if they simply cut costs and trimmed their dividends. There may have been some truth in this, but the industry's requests for rate hikes were not entirely motivated by greed and sloth. A long period of declining prices had ended at the turn of the century and fifteen years of inflation put the railroads in a serious financial squeeze. The railroads, so recently haughty and powerful, were, as industrial enterprises, being forced into decline, a fact that the government only admitted when it seized and operated them during World War I.¹¹ When the U.S. entered the war the powers of the ICC were suspended and Wilson appointed his Treasury Secretary William McAdoo as Director of the Railroads. In 1918 McAdoo granted the railroads a sizable rate increase to keep them economically viable.

In 1890, three years after creating the ICC, Congress passed the Sherman Antitrust Act. Unlike the earlier Act to Regulate Commerce, the Sherman Act did not set up a regulatory commission to enforce its provisions. The Act declared illegal "every contract, combination in the form of trust or otherwise, or conspiracy, in restraint of trade or commerce," and defined as criminal "every person who shall monopolize, or attempt to monopolize . . . any part of the trade or commerce among the several States, or with foreign nations."¹² Enforcement was left with the Department of Justice, which during the following two decades chose to prosecute primarily small firms that colluded to fix prices and labor unions that engaged in strikes, rather than the giant trusts that dominated such industries as tobacco, petroleum and steel.

By 1910 it was becoming clear that an expert commission was needed to interpret the broad language of the Sherman Act and insure that anti-trust enforcement focused on the right targets. After much debate two supplemental bills were passed in 1914. The Clayton Act clarified what kinds of business practices constitute restraint of trade, while the Federal Trade Commission Act created a board of five commissioners (FTC) to

10. On regulation in general, see Thomas K. McCraw, *Prophets of Regulation* (Cambridge: Harvard University Press, 1984); for the ICC see Ari and Olive Hoogenboom, *A History of the ICC* (New York: Norton, 1976).

11. Albro Martin, *Enterprise Denied: Origins of the Decline of American Railroads, 1897-1917* (New York: Columbia University Press, 1971).

12. McCraw, p.78.

interpret antitrust law and determine in specific cases what methods of commercial competition were unfair and, when necessary, to order offenders to 'cease and desist' from using those methods. Since a regulatory regime had already been created for transportation, the FTC was not given authority in this area. But its creation 27 years after the ICC was set up clearly indicates that the Progressive regulatory program was still being vigorously implemented.

Building the Panama Canal was one of the heroic engineering projects of the early twentieth century and the federal government attached great strategic and commercial importance to this new inter-oceanic waterway. But as the canal neared completion it was realized that the railroads would oppose the anticipated revival of intercoastal maritime competition and that they were likely to do whatever they could to defend their dominance of the coast-to-coast freight business. Should the government stay out of this competition between modes and let it be settled in the marketplace? Not likely, for Washington, having invested so much money and hope in this project, felt compelled to defend the canal's commercial prospects. It therefore passed the 1912 Panama Canal Act, which amended the Interstate Commerce Act by specifically prohibiting railroad companies from having any interest in water carriers operating through the Panama Canal, especially if they transported cargoes the railroads might otherwise have carried.¹³ Evidently Congress had come to see the ICC, which was initially established to determine and enforce fair railroad rates, as the tablet on which it could inscribe whatever policies it felt were necessary for the domestic freight transportation industry. It was a way of using this commission that Congress would employ again in the 1930s as it struggled with the consequences of the depression.

When President Wilson decided the United States needed its own merchant marine to carry its overseas trade, the issue of combination in restraint of trade had to be addressed. Iron-hulled steam-powered ocean-going ships are, like railroads, expensive industrial artifacts that have to be continually earning revenue to cover their costs and provide a return on investment, yet as in other areas of transportation at the end of the nineteenth century, excess capacity and unrestricted competition among steamship lines repeatedly drove cargo rates down to levels that threatened to bankrupt the weaker firms. Liner companies responded to this threat by forming conferences that set freight rates on specific trade lanes, allocated cargo among members, and sometimes pooled and shared profits. These international cartels also defended their control of trade routes by deploying 'fighting ships' that carried cargoes at a loss when

13. Gibson and Donovan, pp.94-5; John G.B. Hutchins, *The American Maritime Industries and Public Policy, 1789-1914* (Cambridge, Mass.: Harvard University Press, 1941), pp.578-9.

necessary to prevent other operators from forcing their way into the trade. All foreign governments allowed such conferences to exclude non-members, but such an arrangement would clearly violate U.S. antitrust law. U.S. ocean carriers soon discovered that antitrust regulation was not a matter of domestic concern alone.

In 1916 Congress passed three 'preparedness' bills submitted by the Wilson administration. Having had no success in getting the warring nations in Europe to heed his pleas for peace negotiations, Wilson concluded the Great Powers of Europe would only listen to the United States if it too became a Great Power. He still hoped to avoid being drawn into the war in Europe, but he realized that a lack of preparedness was being interpreted as a sign of weakness and an absence of resolve. Wilson therefore asked Congress to pass a Navy Act, an Army Act, and a Shipping Act. The first two expanded the armed services, the third authorized the building of a world-class merchant marine. Prior to this the United States had relied on foreign shipping lines to carry almost all of its overseas trade. When Europe went to war in 1914, the U.S. found itself without carrying services while its export cargoes rotted on its docks. The 1916 Shipping Act therefore authorized the building of a fleet of merchant ships at government expense, to be privately operated when possible, that would provide adequate carrying service for the nation's foreign commerce and for its armed services in times of peace and war.

The Shipping Act created a five man Shipping Board that was given broad powers to deal with antitrust issues.¹⁴ Companies operating U.S.-flag ships could join conferences, but only if the conference agreed not to use fighting ships or provide deferred rebates. The law also required that any conference that included U.S.-flag ships must be open to any steamship company that wished to join and that trade with U.S. ports be open to all carriers, whether members of the conference or not. All U.S. liner companies were also required to file their rate schedules with the Shipping Board. The restrictions attached to the antitrust exemption granted to U.S. carriers engaged in foreign trade thus eliminated many of the advantages of the conference system. Although the Shipping Board did not control ocean freight rates as directly as the ICC controlled railroad rates, it required that they be published and that competition be open to all. The railroads already had their regulatory commission and now the ocean-carrying industry had its. Modalism, reinforced by the creation of separate bureaucracies to regulate and enforce compliance in each mode, had been firmly institutionalized.

The First World War gave the United States its first taste since the Civil War of a mobilized and centrally directed economy. The govern-

14. Gibson and Donovan, pp.109-10.

ment seized and operated the railroads and, having committed itself to a massive deployment overseas, poured money into the construction of an enormous merchant fleet. By the time its shipbuilding program was shut down, the nation had spent more than twice the value of the entire world's pre-war commercial fleet on building a new U.S. merchant marine. When the war was over the railroads and much of the merchant shipping were returned to private corporations, but the possibility of direct public control was not forgotten. America had moved far from the days of enterprising Yankee shipbuilders, innovative ship operators, and free-wheeling railway managers. The transformation of freight transportation from an entrepreneurial private enterprise to a regulated public utility appeared irreversible; government oversight of industries 'affected with a public interest' was becoming ever more constraining.

As demobilization proceeded following the First World War, the government tacitly acknowledged that it had an obligation to set policy for the industries it regulated, yet it was ill-equipped to do so. The Transportation Act of 1920, the Esch-Cummins Act, provided for the return of the railroads to private operation, but it also greatly strengthening the powers of the ICC.¹⁵ The Commission could now set minimum as well as maximum rates and was instructed to see that the railroads obtained a fair rate of return. The Commission was also to supervise the issuing of railway securities and proposals for consolidation. The government also announced its determination to make the industry healthy, and rather than leaving that job to management and market competition, it told the Commission to move toward consolidating the country's railroads into a limited number of systems. The 1920 Act also created a nine-man Railroad Labor Board to address the industry's intractable labor problems. Although the bill was called a Transportation Act, it in fact addressed the problems of a single mode. The government was still dealing with transportation problems mode-by-mode, as it had done when creating its original regulatory commission.

The Merchant Marine Act of 1920 did much the same thing for its industry.¹⁶ It authorized the sale of government ships to private companies, defined the nation's maritime policy, and strengthened federal oversight of the industry. Popularly known as the Jones Act, the 1920 Act restated and strengthened the exclusion of non-U.S. ships from trade be-

15. John F. Stover, *American Railroads*, 2nd. ed., (Chicago: University of Chicago Press, 1997), pp.179-80; William L. Richter, *The ABC-CLIO Companion to Transportation in America*, (Santa Barbara, California: ABC-CLIO, 1995), "Transportation Acts," pp.513-6.

16. Gibson and Donovan, pp.119-21. 17. Hoogenboom, p.128.18. For details, see Gibson and Donovan, chapter 7.19. McCraw, p.262.20. Ellis W. Hawley, *the New Deal and the Problem of Monopoly: A Study in Economic Ambivalence* (Princeton: Princeton University Press, 1966), pp.226-7.

tween U.S. ports, including those in the nation's offshore territories, thereby reserving these trades for ships built in the United States and owned and crewed by U.S. citizens. The 1920 Act also reinforced the nation's commitment to providing U.S.-flag service on all essential trade routes and strengthened the antitrust penalties for conferences that did not abide by its rules. As with the railroads, the government forthrightly stated its intentions for merchant shipping in 1920, but it did so within an entirely modal conception of freight transportation. Formulating a comprehensive and truly national transportation policy was not yet part of the federal agenda.

During the 1920s the number of cars, trucks and hard-surfaced roads and highways increased rapidly. This hurt the railroads as they lost passengers to cars and buses and as trucks captured an increasing percentage of the lucrative small-lot freight business. Trucks, like ships, did not have to build their 'way'; they were free to go wherever there were adequate roads and to adjust their routes to suit their customers. Trucks offered better service and quicker delivery than the railways could provide. The motor truck industry consisted of thousands of small-scale enterprises, many of them single truck operations, and it was not burdened with the regulatory constraints, deferred maintenance, or enormous sunk costs that weighed down the railroads. The railroads tried to hold on to their customers by starting their own trucking companies and by carrying truck trailers on flatcars, but they soon ran afoul of requirements that they operate in only one mode, and in most cases they simply could not match the service provided by the truckers. Just as the coastal and inland waterways had earlier lost much of their passenger and freight trade to the railroads, so too did the railways lose passengers and general freight to cars, buses and trucks. This would not have been fatal had the core sectors of the railroad business been in good shape when the motor truck industry began to grow. It was not modal competition that put the railroads in peril in the 1930s, it was the constraints imposed by rate regulation and the absence of vigorous management that kept them economically weak. Regulated and slow to respond, the railroads were ill-prepared for the rigors of the depression.

The prolonged collapse of industry during the Great Depression changed everything. Whereas the ICC had been created to serve the cause of justice by restraining the railroads' use of monopoly power, the government's task in the 1930s was to revive industry and the economy it served. The transportation industries were no longer wild horses that had to be brought under control, they were ailing beasts of burden that needed to be nursed back to health. Protection and subsidy of key industry sectors was called for, not close supervision of powerful monopolies and cartels.

New Deal legislation brought the government's modal organization of the transportation industry to a culmination, but it did so in a way that radically undermined the public interest assumptions that had informed this program at its outset. Regulation was originally imposed to protect the public interest against the economic power of 'natural monopolies' such as railroads that provided towns with their only freight service. But nearly fifty years of regulatory experience and technological change had transformed the original regulatory apparatus into a powerful opponent of modal competition. Federal transportation policy made no effort to plan and implement a coordinated, rational, efficient national transportation program, nor, alternatively, did it favor deregulation and letting the marketplace determine the allocation of transportation investments and services. It was instead committed to protecting from modal competition the various modes of transportation that had developed up to the time of the depression. This was a reasonable goal at the time, for the most pressing need then was to get industry working again and the men back on the payroll. But when the depression was over the walls that isolated the different modes from each other remained. Modal autonomy had become institutionalized by law, bureaucratic regulation, and federal protection and subsidy; it had also become deeply ingrained in the corporate culture of the modal industries. This is the entrenched legacy of modalism that the transportation industry is still struggling to overcome.

The dire condition of the railroads was first addressed in the June 1933 Emergency Railroad Transportation Act. In addition to altering some of the ICC's powers, the Act created the temporary position of Coordinator of Transportation. This individual was to be appointed by the President, would work with the ICC, was subject to the scrutiny of federal courts, and was charged with rationalizing the nation's rail system. The veteran ICC Commissioner Joseph Eastman was appointed as the first Transportation Coordinator, but despite his skill and experience he was not able to make much progress on the impossible task he had been given. As one commentator has noted,

[Eastman] succeeded only in coordinating opposition to him and his office. He shrewdly analyzed those opposing cooperation as management, unable to break old habits of thought; railroad officials and laborers, afraid to lose their jobs; communities, apprehensive about service; supply companies, worried about collective railroad scientific research and purchases; and large shippers, anxious to play railroads against each other.¹⁷

In his annual reports Eastman argued against nationalization of the railroads and urged instead that trucking and inland-water carriers be brought under ICC regulation and that the ICC be reorganized. The 1935

17. Hoogenboom, p.128.

Motor Carrier Act was the most significant achievement to flow from these proposals. It provided for extensive regulation of trucks operating as common carriers, that is to say those that accepted cargo from all who offered it and carried it at published rates; truckers who carried cargo under private contracts were subject to lesser levels of regulation. The 1935 Act also gave the ICC the power to issue the certificates required to operate as common carriers and to set maximum and minimum rates and other standards for management and operations. Only minimum rates could be set for contract carriers. Determined to revive industries that had been knocked flat by the depression, Congress wanted the ICC to prevent a rate war between truckers and railroads. Truck rates were therefore tied to existing rail rates, a decision that pleased the railroads but cost them dearly as truckers began providing superior service for the same cost.

The Merchant Marine Act of 1936 provided that industry with a highly elaborated program of regulatory oversight and a program of construction and operating subsidies designed to make U.S.-built ships operating under U.S. registry competitive in international trade.¹⁸ It remains the organic act for U.S. maritime policy today, although its subsidy programs have been almost entirely eliminated.

The increase in the ICC's workload was such that by 1937 a committee recommended President Roosevelt create a new department of transportation, but nothing came of it. This increase in the ICC's workload was one of the reasons that when Congress turned its attention to aviation, it decided to create a new Civil Aeronautics Board (CAB) rather than simply assigning this additional responsibility to the ICC. Established under the Civil Aeronautics Act of 1938, the CAB was expected to follow 'the usual system of economic regulation [according to] the recognized and accepted principles of the regulation of public utilities, as applied to other forms of transportation.'¹⁹ Congress' goal was to bring stability to the airline industry, and so it did. The 1938 Act and CAB regulation effectively cartelized the airline industry in a form that remained essentially unchanged for the next forty years. Once again it became clear that federal regulation, as codified in the New Deal, imposed an enduring if inefficient structure of modalism on the transportation industry.

This New Deal legislative program was completed by the Transportation Act of 1940, which gave the ICC jurisdiction over coastwise, inter-coastal, inland, and Great Lakes common and contract water-carriers engaged in interstate and foreign commerce. Bulk cargoes were exempted from regulation, however, which greatly limited the impact of this

18. For details, see Gibson and Donovan, chapter 7.

19. McCraw, p.262.

extension of the ICC's authority. The overall result of this program was that a number of traditional freight carriers that could not have survived in unregulated competition acquired a politically-based vested interest in legislation passed to restart the transportation industry during the depression. Long after the depression had faded into history they continued to oppose any changes that would reduce the protection the federal government afforded them. Modal competition had been trumped by depression and shippers would pay the bill for years to come.

The main thrust of the interpretation presented above is nicely summarized in the following two paragraphs in which the historian Ellis Hawley describes what he calls the 'perversion of the public utility concept'. This phrase could serve as the epigraph for the story of how the federal government inadvertently but effectively imposed a rigid and enduring modal structure on the American freight transportation industry.

In the United States the term 'public utility' generally conjures up a vision of an inherently monopolistic industry providing essential public services, one in which the nature of the service, the large amounts of capital required, and the presence of high fixed costs all combine to produce large economies of scale and make any competitive duplication of facilities wasteful and inefficient. It is usually conceded, too, that in dealing with such 'natural monopolies,' society may resort to public regulation. Since the purpose of this presumably is to protect consumers, the industries concerned are expected to resist its establishment as long as possible. But under depression conditions like those of the nineteen thirties, these commonly held assumptions were of doubtful validity. On the contrary, for a number of declining, overly competitive, or particularly depressed industries, the status of a public utility became a means of economic salvation, a way to enter the haven of publicly regulated monopoly and use the power of the state to stabilize prices, reduce competition, and insure profitable returns on overcapitalized structures.

One field in which this perversion of the public utility concept was especially noticeable was that of transportation. Under depression conditions and in view of the threat posed by newer forms of transport, the leaders of the older transportation industries had begun advocating a broad extension of the public utility approach, an extension they justified by appealing to past precedents, arguing that transportation was a 'natural monopoly,' or stressing things like public safety or national defense. And the result was a mixture of controls, protection, subsidies, and publicly sponsored cartels, a system in which the government became not only a regulator, but a protector, supporter, and provider as well.²⁰

20. Ellis W. Hawley, *the New Deal and the Problem of Monopoly: A Study in Economic Ambivalence* (Princeton: Princeton University Press, 1966), pp.226-7.

CONTAINERIZATION, DEREGULATION, INTERMODALISM

Federal regulation of freight transportation made modalism the organizational model for the industry as a whole and preserved that structure by minimizing competition both from other modes and from new entrants. The modes were separated in practice by the persistence of labor-intensive cargo handling at modal interfaces and in principle by regulatory constraints that prevented companies from operating in more than one mode. Of course several different modes still had to be used when moving cargoes long distances over land and water, but each segment of such voyages was managed by a different firm using machines and procedures specific to the mode being employed. Since no single firm was responsible for the entire move and the methods of cargo packing and handling were not designed to serve all phases of the system, shipments that required two or more modes can be said to have been multimodal rather than intermodal. Goods were moved, to be sure, but freight transportation was making little progress toward becoming a comprehensive integrated system. The costs and losses in freight transportation remained high; attempts to alter standard practices and increase efficiency were few.

The mold was broken by two developments. The first of these, introduced in the 1950s and by the 1970s widely accepted as the best way to pack and move general cargoes, was containerization. The second development, articulated by economists in the 1950s and written into the legislation that deregulated the transportation industries in the last three decades of the twentieth century, stressed the need to seek economic efficiency by comparing costs across modes. Containerization promoted intermodalism by placing cargoes in standard-sized boxes that could be moved by all three modes of surface transportation without being opened and repacked. It provided the technology that made intermodalism possible and cost-efficient. The economic critique of the established regulatory regimes demonstrated how illogical their conception of the industry had become from the point of view of business and economics. The deregulatory legislation generated by the economists' critique eliminated much of the regulatory overload that hampered business decision making and allowed companies to operate in more than one mode. It then became possible to create companies whose mission was to engage in intermodal freight transportation and achieve some of the cost reductions and efficiencies the economists were calling for.

Although Malcom McLean was neither the first person to propose packing cargoes in standard-sized boxes nor the only carrier to do so in the 1950s, he quickly became the foremost entrepreneur of the container revolution, the man whose innovative vision and entrepreneurial drive

created a new and stunningly more efficient way to transfer cargoes from one mode to another.

McLean was a successful trucker and his approach to containerization was largely guided by his experiences in the trucking industry. His trucking firm carried freight up and down the east coast. He was familiar with the consequences of road congestion and delays in ports when delivering cargoes to be loaded aboard ship, and he was looking for a way to avoid these problems. What he wanted was a way to move loaded trailers in lots so they would not have to be hauled individually over the highway. They could of course go piggy-back on trains, but the Southern Railway rebuffed him when he suggested they explore the possibility of working together. McLean knew that carrying freight over water is the least expensive way to move it, but maritime freight service along the east coast was moribund. He therefore decided to get hold of his own ships and carry his boxes in large lots from port to port. Since the ICC regulated coastal service and was disinclined to allow anyone new into the trade, McLean bought a steamship company that already had the necessary operating certificates. He fitted out an old tanker to carry containers on deck, expecting that he could also carry oil or oil products on the trip north from Texas, but the Coast Guard would not allow it. Like Brunel, Thompson and Hill, McLean thought of his steamship company as an extension of his overland firm, but the ICC told him he could only operate in one mode. McLean then proved himself a true entrepreneur, a man willing to bet everything on a new idea, by selling his trucking company and plunging into his new venture whole hog. He went on to make a huge success of the company he called Sea-Land Services, and in doing so he made the use of containers mandatory worldwide for general cargoes moving in liner service whether on water, rails or highways.

McLean did not set out to make intermodalism possible, he simply wanted to move his cargoes cheaper, faster and with less damage. He had made his way in the world of modalism and never expected the freight transportation industry would be radically deregulated. He conformed to all the rules and regulations that were in place, yet managed to effect a revolution by transforming the way longshore work was done, a sector of the industry that had never been considered a natural monopoly and hence was not closely regulated. It was fortuitous that McLean launched his new company in the coastal shipping trade, for that freed him from foreign competition, yet when he later began overseas service he was also successful, for by then he had a novel product he knew how to sell. McLean purposefully avoided seeking construction or operating subsidies from the government when building ships for international trade, for subsidized ships could not be switched to new trade lanes without permission from Washington, which if granted at all usually came only after many

months. McLean managed his fleet of ships as nimbly as he had managed his earlier fleet of trucks and insisted on being free to deploy his assets as he saw fit. Smart, hard-driving, a wizard at finance and a first-rate recruiter, McLean demonstrated how lots of money could still be made in a highly regulated industry. McLean gave the freight transportation industry a tool of fundamental importance to the transition from modalism to intermodalism, but he used it in a highly individualistic way. He enjoyed first-entrant advantage as the originator of the new technology and made most of his money by capturing market share from the steamship lines that were handling cargoes in the traditional breakbulk manner. McLean was a shrewd innovator whose cost-driven view of the world frequently revealed opportunities overlooked by those more interested in fighting old fights and maximizing the protection and support they received from the government. McLean found a way to operate as an old-fashioned entrepreneur in a highly regulated industry. It was an unusual performance at the end of two generations of regulatory constraint. There weren't many like him.

Deregulation was more tidal than individual, a change brought about by a spreading sense of dysfunction and business failure rather than by aggressive innovation or political action. The word itself is negative, implying a loss of faith, and indeed there were many reasons for thinking that a belief system that had been expanding for nearly a century was built on sand. But churches, once established, do not crumble at the first whiff of heresy, and there were a great many workers, legislators, managers, and bureaucrats who had figured out how to make regulated industries work for them and were in no hurry to see them change. It was finally functional collapse rather than academic critique that brought down the regulatory regimes, but it was important to the success of deregulation that the economists had developed a rationale for abandoning these regimes when they failed.

One of the earliest economic studies that put regulation in the crosshairs was written in 1958.²¹ The authors begin with a claim that their subject has recently become a matter of some urgency:

The problems of the United States transportation industries have become in recent months a major concern of domestic policy. In a certain sense, the recent discussions have been very much like previous debates on transportation policy: dire predictions are made of impending bankruptcies, abandoned communities, stranded commuters, and curtailed services. Even proposed solutions are much the same. The search continues for some magic panacea that quickly cures all woes. These turn out to be such familiar suggestions as government ownership, large-scale mergers of existing compa-

21. John R. Meyer, et al., *The Economics of Competition in the Transportation Industries* (Cambridge, Mass.: Harvard University Press, 1960), p.viii.

nies, tax exemption for all transportation properties, Federal loans, and increased and stricter regulation of everyone and anyone (other than the proposer) who might have anything to do with the transportation of people or property.²²

The irreverent tone with which the authors begin indicates that the established regulatory regimes were no longer considered sacrosanct. While the book presents a good deal of technical analysis to buttress its policy recommendations, the authors repeatedly recast the issues under consideration in ways that make the received forms of regulation appear distinctly odd. The chapter on “the rational allocation of transportation resources” begins with the straight-forward claim that “the objective of public regulation in the transportation field is generally accepted to be the satisfaction of the transportation requirements of the economy with a minimum use of economic resources.”²³ ‘Generally accepted?’ What happened to the tension so central to Progressive policy between public and private interests? Evidently these economists see a community of interest where Progressive politicians saw antagonism.

By 1970 economists had, as Thomas McCraw has put it, restored ‘the market’ to intellectual respectability within universities and were beginning to apply their analyses of how markets work to social arrangements that had previously escaped close economic scrutiny.²⁴ In that same year Alfred E. Kahn published the first volume of his study on *The Economics of Regulation*, a work that laid out the position he adhered to during his subsequent years as a leading figure in the deregulation of public utilities.²⁵ Appointed chairman of the Civil Aeronautics Board in 1977, Kahn learned first hand what he was up against. He already knew from his experience with the New York Public Service Commission that commissioners, under the tutelage of lawyers, emphasize procedural due process rather than economic efficiency. At the CAB he found the greatest resistance to deregulation came from the airline labor unions, who had used the cost-plus thinking and protectionist policies of the Commission to raise their members’ wages to exceptional levels.²⁶ Testifying before a House committee in 1977, Kahn listed examples of the kinds of ‘picayune decisions’ the CAB was routinely asked to make. He ended by saying, “Is it any wonder that I ask myself every day: is this action necessary? Is this what my mother raised me to do?” A year later he answered his own question with a sweeping indictment of the entire regulatory enterprise:

Control price, and the result will be artificial stimulus to entry. Control entry

22. *Ibid.*, p.v.

23. *Ibid.*, p.145.

24. McCraw, p.223.

25. New York: Wiley.

26. McCraw, pp.244, 270.

as well, and the result will be an artificial stimulus to compete by offering larger commissions to travel agents, advertising, scheduling, free meals, and bigger seats. The response of the complete regulator, then, is to limit advertising, control scheduling and travel agents' commissions, specify the size of sandwiches and seats and the charge for inflight movies. Each time the dike springs a leak, plug it with one of your fingers; just as a dynamic industry will perpetually find ways of opening new holes in the dike, so an ingenious regulator will never run out of regulatory fingers.²⁷

Intellectually, the debate over regulation was turning into a rout.

Academic criticism alone would not have brought down the regulatory regimes that created and sustained modalism in transportation; it was institutional and business failure that finally made action unavoidable. By the mid-1970s the evidence of such failure was undeniable. Ari and Olive Hoogenboom began their history of the ICC, published in 1976, with the following summary judgment:

Nearly everyone agrees that the Interstate Commerce Commission (ICC) has failed. The disintegration of freight and passenger service; the dependence on highways, interstate trucking, and automobiles in the midst of a growing energy shortage and an ecology movement; the chaos of rates and regulations bearing little or no relation to costs all contribute to a massive transportation crisis that wastes billions of dollars annually. Established in 1887 as the first independent regulatory agency – and becoming the model of subsequent ones – the ICC did not fulfill its founders' hopes that it solve the railroad problem. Despite having been charged further in the 1920s with building up a system "prepared to handle promptly all interstate traffic of the country," the ICC planned nothing.²⁸

Could the ICC survive such categorical condemnation? Regulatory regimes are not without their defenders, whatever the charges laid against them, and even when bureaucracies perish, they do so slowly. For the ICC the end came in 1995 when the oldest of all the federal regulatory commissions was eliminated and the few of its tasks that did not disappear with it were passed on to its successor agency, the Surface Transportation Board, or parceled out to other offices.²⁹ By that time much of the legislation needed to deregulate the various transportation industries had already been passed and several of the regulatory bodies that had created and sustained modalism had been consigned to history. The creation of Intermodal firms and the construction of efficient and economic global transportation systems now became possible and is indeed proceeding apace. The range of federal regulatory intervention has been greatly reduced, the range of market-based decision making has been greatly ex-

27. *Ibid.*, p.272.

28. Hoogenboom, p.ix.

29. For a brief summary, see Muller, p.47.

panded. In one sense the transportation industry is now operating with a freedom it has not enjoyed since the closing years of the nineteenth century; in another sense it is now working with technologies that are so novel they make comparisons with the past completely unhelpful. Yet however the future is described and whatever its relation to the past, freight transportation in the post-modal era promises to be full of surprises.

EPILOG – A ROLE FOR HISTORY

Late in December 1999, Mr. Floyd Norris, the chief financial correspondent of *The New York Times*, wrote an article listing the “12 biggest business blunders of the past 100 years.”³⁰ He describes the first of these, titled ‘Railroads’ Narrow Track’, as follows:

For the first half of the [twentieth] century railroads were the undisputed masters of national transportation. But since they thought of themselves as railroads rather than transportation companies, they never tried to expand into either trucking or airlines at a time when their capital could have given them the edge. In mid-century, many of the rails went through bankruptcy reorganization, and it was decades before they began to make good money through intermodal service – the shipping of goods by a combination of rail and trucks.

Could anyone familiar with the history of American railroads say they were ‘the undisputed masters of national transportation’ in the first half of the twentieth century? Was intermodal service something that was just waiting to be put into effect? Mr. Norris’ ignorance of the history of transportation is breathtaking. What he has done, in the absence of any sense of what really happened, is project the present on the past by assuming that the railroads simply did not do what they could easily have done, that is initiate the kinds of intermodal service that has served them so well since deregulation. So much for history.

There is no need to hammer Mr. Norris for this stumble, but it does provide a useful reminder of how quickly past constraints, once removed, are forgotten and how easily reasons are concocted and blame is assigned once an informed sense of the past has been lost. An awareness of the complex historical relations between the government and the transportation industry needs to be kept alive and passed on precisely because it is a troubled and inescapable relationship. If we do not learn from the past, we will go into the future as blindly as Mr. Norris, unwittingly, would have us do.

30. *New York Times*, 20 Dec. 1999.