Shipping Containers: A Bibliographic Essay

John Tomlinson for LIS 652-2/Debbie Rabina

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Introduction

It's a question that's both clichéd and thought-provoking: "What is the most important invention of the last ten years/the century/in history?" There are many potential answers. The personal computer. The internal combustion engine. Movable type. While a single answer is probably not possible for any significant time frame, thinking about this question can be fun and informative.

For me one possible answer, at least from the last 100 years, is the intermodal shipping container: the reusable steel or aluminum boxes constructed in a few standard sizes (from 10 to just over 50 feet in length) that are used to transport goods by ship, train, truck and, rarely, airplane. Shipping containers have dramatically driven down costs of transportation, resulting in huge increases in world trade and tremendous shifts in

worldwide patterns of production and consumption. Economic globalization as we know it would not be possible without the container, and it can be argued that the container was a key element in the explosion of world trade from the late 1960s (Levinson, 2006c).

My interest in containers arose at the same time as my first "library" work when, during down-time from running errands as an office boy at a marine engineering company, I put together a shelf list of all the material in our reading/conference room. The collection consisted mainly of magazines and journals on all aspects of our business, including containers and container ships. This was more than twenty years ago, when I was in high school, and I wish I had a copy of the list now.

The question for this essay is how can we find materials about shipping containers, including their history, use and impact on the world.

Getting Started: Encyclopedias

A good first step in learning about a new subject is an encyclopedia. Through Pratt we have access to the full-text of *Encyclopædia Britannica Online*. Although there is no entry for "container," "shipping container," "intermodal container," or "intermodal shipping container," there are entries for "container ship" and "containerization." Both are very short, saying not much more than I know, apart from the term "containerization" which I'd forgotten. I made a note to use that word (and also alternative spelling "containerisation," since it is a global phenomenon) in future searching.

Interestingly, *Wikipedia* has much more information in longer entries on "containerization" and "intermodal container." Other reading proved material in these articles to be accurate, and together both entries give a nice overview of the history and

development of containers, and their impact on the world. Both also have reference lists of both print and online material.

Books on Containers

Through *Wikipedia*, I found several books and articles devoted to the subject of containers. My next stop was the online catalog of the New York Public Library (NYPL), and then the Science, Industry and Business Library (SIBL) to get them. *The globalisation of the oceans: Containerisation from the 1950s to the present* by Broeze (2002), *The box: How the shipping container made the world smaller and the world economy bigger* by Levinson (2006) and *Box boats: How container ships changed the world* by Cudahy (2006a) all give excellent overviews of the early development of shipping containers and their impact on the companies that used them, ports around the world, and world trade. The latter two are a little breezier in tone, suitable for pleasure reading for a layperson. *Box boats* focuses a little more on the ships that carry containers.

In the library I also came across a book on the history of containers that was written as a sort of commemoration of the industry, *The box that changed the world* by Donovan and Bonney (2006), which contains many photos as well as congratulatory (and self-congratulatory) letters from major shipping companies, ports and other actors in the shipping business. Like the three books above, it would be an excellent single source if someone wanted to read just one work about containers. However, it pays somewhat less attention to negative aspects of containerization, such as on dock labor and the environment.

Books on Ports & Shipping

The titles of the four books above allude to the influence of containers on the world economy as a whole, and each gives detail on that impact. But they also all talk about ports, so sources about ports are also important if we want to learn more. Brown's *Port of London* (1978), Chiu's *Port of Hong Kong* (1973), and Starr's *Rise and fall of New York City* (1985) are general histories. The latter doesn't focus just on the port, but nonetheless gives a detailed look at how the rise of containers ended shipping as a major industry in New York City, moving it to places like Elizabeth, New Jersey, where there was sufficient land exists for containers to be storied and loaded. If we compare photographs or even movies of the west side of Manhattan from the 1940s or 50s with the present day, the disappearance of cargo handling facilities is remarkable.

This might be the moment to step aside from our bibliographic journey in order to outline the history of containers as described in these sources. Commercial use of containers was pioneered by an American businessman named Malcolm McLean and his company Sea-Land Service, starting in the late 1950s. The use of such containers spread rapidly in the 1960s and 1970s. At the most basic level, containers allow cargo to be loaded onto and unloaded from ships much more quickly, with less handling, than previously.

Before containers, cargo might be loaded from, say, a factory onto a truck at the factory. The truck would drive to a railroad terminal, where the cargo (either loose, in boxes, or on pallets) would be unloaded either directly onto a train, or more typically onto the ground or into a warehouse for storage and later placement on a train. Trains might take the cargo to portside, or trucks going to a port. The cargo would be unloaded and

stored along the docks, then later loaded onto ships. These many instances of handling added to costs of shipping, and those high costs inhibited international trade. According to Levinson (2006c), in 1961 ocean freight costs made up 12% and 10% of the value of U.S. exports and imports respectively, and were so high that for some goods international sales were not possible.

Containers reduced these costs dramatically, with handling of goods just twice: at the factory or source of production, where material is loaded into a container, and at the end of the journey where it is unloaded to be sold or used. These greatly reduced costs resulted in huge growth in international trade and more emphasis on low costs of production, rather than proximity to of producers to buyers. Moreover, ships could be loaded much more quickly, with large quantities of goods already arranged in containers, in comparison to the tedious loading of palettes or smaller boxes of items under the previous "break bulk" methods.

Containers, built around standard sizes that could be used by different companies and on different modes of transportation, also changed the business of shipping, with many fewer dockworkers needed and much more space required along the docks to deal with expanded trade and storage of (typically filled) containers.

Beyond just the history, economists and other scholars also take a great interest in effects of containers on ports and trade. Brookfield's *Boxes, ports, and places without ports* (1984), several articles in Pinder and Slack's *Shipping and ports in the twenty-first century* (2004), and Erie's *Globalizing L.A.* (2004) are examples of these. Here we learn how the quest for lower costs through economies of scale lead to expansion of the size of ports, and sometimes consolidation of nearby ports into larger facilities with, for example, the

ports of Long Beach and Los Angeles in California growing as they compete with each, then ultimately coordinating their efforts to compete with other places such as Seattle in attracting commerce.

By the early 2000s, 300 million 20-foot containers were being moved by sea each year, with over a quarter of those shipments coming from China (Levinson, 2006c).

Expanding the Search: Trade Publications

Through the *Wikipedia* references, the NYPL catalog, and the bibliographies in these books, we can find much more material. For example, Cudahy and Levinson also wrote articles, drawn from their books, in a 2006 issue of the trade magazine *TR News*, which focused on intermodal shipping containers. That issue contains other articles from other authors as well. *TR News* is published by the Transportation Research Board of the National Research Council, a nonprofit professional organization, and other issues over the years are likely to touch on containers as well.

Containerisation International is a monthly trade journal launched in the 1960s with articles about all aspects of container shipping. Its tagline in the early 1990s was "The voice of intermodalism." The journal's website contains extensive articles, statistics and links to other publications, such as about specific types of containers. This journal also has a yearbook, copies of which are held by NYPL, which includes a directory of ports, suppliers, consultants and other vendors. It also presents statistical information and includes a few summary articles reviewing the year. The publications are interesting not only for the articles, but also for the many advertisements from shipping companies, railroads, service vendors, manufacturers, ports and others.

The well-known defense and transportation publisher Jane's produces *Jane's Containerisation Directory*, which is similar in scope to the *Containerisation International Yearbook*, as well as *Jane's Merchant Ships*, which lists ships around the world, including container ships. And as with *Containerisation International*, extensive information is available by subscription at the publisher's website.

Wilson's Business Full-Text index is a useful source of access to other trade publications, pointing to journals such as *Traffic World* and *American Shipper*. This index contains a subject category "container ships" which is a quick way to find material.

Other Periodicals & Articles

But what of writing about containers in non-trade publications? A good way to find this material is also through indices, such as Wilson Web Social Sciences Full-Text, which has a subject classification "Containerization (Freight)." This index includes articles about containers and the shipping companies that use them in general business publications such as *The Economist* and (when it was still published) the *Far Eastern Economic Review*. Interestingly, some of these deal with containers as a vector for smuggling and terrorism, as well as use of containers as buildings. This index also points to articles in scholarly journals, such as *The Canadian Geographer* and the *Journal of Economic Issues*, and to publications of non-governmental organizations, such as a piece from the World Watch Institute on the environmental impact of container ports on nearby communities and ecosystems (Mintzer & Amber, 2005). ProQuest similarly has a subject category for our topic, "containerization," and includes articles in scholarly publications such as *Business History Review* and *Politics & Society*, more general business magazines

such as *World Trade*, and newspapers such as the *South China Morning Post*. The impact of containerization on global trade and on labor is a key topic of some scholarly articles, with one article (Turner, 2000) pointing to an 80% decline in the number of registered dock workers in the United Kingdom over a ten-year period and labor disputes around the world due to containerization, despite huge growth in world trade. The Emerald Management Xtra index includes scholarly articles on the subject as well, such as from *Logistics Information Management*.

Government & Geographic Sources

Depending on the objectives of our research, we might go further afield into other types of material on other, related, issues. For example, U.S. Census data can provide information on changes in employment in particular places. However, the information readily available online as *State & County QuickFacts* appears too coarse to really understand how containers affect employment because dockside labor is not broken out of the general transportation and warehousing industry. But if this was an area of interest, looking at more detailed census data linking labor statistics to geography would be a place to go.

Other government agencies, such as the U.S. Department of Transportation and some of its constituent agencies, collect and publish information specifically about containers. (Some of this information also shows up in a search of the Census Bureau website, which presents tables from the *Statistical Abstract of the United States*.) Using tools such as www.usa.gov and Google's government search service finds interesting information on the use of containers, ports and transportation, often in the form of

statistics and sometimes available as data sets. For example, the U.S. Federal Highway Administration produces *Freight Facts and Figures*, which gives statistics such as "Top U.S. container ports by containerized cargo" and "Incoming truck container crossings by state, U.S.-Canadian border." The U.S. Maritime Administration produces a great deal of information on containers, including a nice map series called *America's marine highways map*, showing among other things major routes for coastal and inland shipping of containers, as well as movement of containers by rail. It is worth mentioning that the search engine on the Maritime Administration's own website did not return any results for "container," so using an external service such as usa.gov or Google, or browsing is the way to find material there.

Not all U.S. Government information is statistical – it includes news and how-to information as well, such as a DOT webpage with a summary of a study on building a container terminal in Connecticut (Wang, 2000), and an article from the National Institute of Justice that describes how to convert a shipping container into a mobile crime lab (Cote, 2009). Depending on a researcher or student's interests, other search or subject terms would be needed to find appropriate information.

Biographical Sources

Another way to learn about containers, as with any technological or business innovation, is to look for information about the people who popularized their use. The general books on containers can serve as biographies of Malcolm McLean, the container pioneer. Indeed, his biography as *Wikipedia* sources three of those books. But we can also

find a concise, detailed biography via the *Biography Resource Center* website, which is drawn from the *Scribner Encyclopedia of American Lives*.

Handbooks, Training Material & More

In browsing the NYPL catalog, I came across a few other types of books relevant to our question. One was *Deep-sea container ports: Systems appraisal and simulation modelling* (Jones, 1972), which is a textbook/training manual for a management course looking at systems aspects of shipping, from the perspective of a port and also regionally. I could imagine that in maritime academies there might be similar material available.

Another was a sort of handbook or manual called *Elements of shipping* (Branch, 1996) which seems to examine every aspect of the shipping business and practice. It includes diagrams of almost two dozen types of containers, such as for general-purpose, for fruit, for products that must be kept warm, and other uses, detailed size specifications for all standard containers, and a section on planning/management of inter-modal transportation.

In browsing around sites on the internet I came across the *Container handbook* put out (in English and German) by Gesamtverband der Deutschen Versicherungswirtschaft (German Marine Insurers, an association). The brief online edition refers to a 1,500 page print version available for purchase. Similarly, the Institute of International Container Lessors produces a number of manuals and technical bulletins about the care and maintenance of containers, some of which are available on their website and some by mail.

General internet search, such as with Google, can turn up a more material as well, though because the word "container" is so generic that more specific terms are needed to winnow results. At a minimum, I used terms such as "shipping container" and "containerization," but depending on interests other terms could be added. The material I found online is diverse, with examples including a lesson plan aimed at teachers grades K-12 on containerization from the New Jersey Marine Sciences Consortium and a master's thesis on containers in India from a student studying in the Netherlands (Gujar, 2005-2006).

A great variety of material is available in print at the library as well, and where open stacks or the library catalog permit, we can find even more information by browsing. One example is a copy of the 1981 proceedings of the *Container Repair & Refurbishment Conference* (Finlay & Thomas, 1981). In this case the proceedings were distributed by a publisher, so strictly speaking they might not be gray literature. But this is a reminder of the many ways information makes it into print. For conferences nowadays, reading the trade literature or searching the websites of organizations in the field (possibly subscribing to alerts or email newsletters from them) would be a way to find out about such events and such relatively informal publications. The bibliographies of the books mentioned at the start of this paper would be another source for gray, and also archival, information.

But not all the material I found browsing online or in the library was as informative as I'd hoped. On the open shelves at SIBL I came across a large ready-reference book, *On the move: A chronology of advances in transportation* (Bruno, 1993) which among the hundreds of entries seemed to only refer to containers twice, while

having dozens of entries for small advances in automotive and aviation technology, such as flights of particular planes.

Conclusions

The lack of attention to containers in *On the move* is not that surprising. Containers are apparently mundane things, the use of which has had tremendous impact in the world. In popular literature today, it seems we come across containers most when they are used in new ways, such as for housing or office space (Martin, 2009). But the huge economic, and also social and political, impact of containers is reflected in the diverse publications about them and the variety of directions one could take in looking for information when we dig a little further.

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[Except were indicated, online material was retrieved in April 2010.]

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