SILK TRAINS OF NORTH AMERICA

Painting by Harlan Hiney, reproduced with permission

The cover painting is by the eminent Canadian railway artist, Harlan Hiney. It depicts a Canadian Pacific Railway silk train speeding through Morley, Alberta. Note that the bell is ringing and the whistle blowing. This illustration captures the essence and excitement of a silk train in a way which no photograph possibly can.

Locomotive 2631, 4-6-2 class G2E, was built by the Montreal Locomotive Works in May 1913 and scrapped in March 1941. The driving wheels were 70" in diameter, and the cylinder dimensions 22.5 x 28 inches. The tractive effort was 160%, the engine weight, loaded, was 217,000 pounds, and the tender weight, loaded, was 139,000 pounds. The tender carried 12 tons of coal and 5,200 Imperial gallons of water. (O. Lavallée, *Canadian Pacific Steam Locomotives* Railfare Enterprises, Toronto, 1985, ISBN 091913030348).

The box baggage cars, depicted in the consist, were specially built for the CPR in 1925 and 1928. They are described in more detail in the text.

SILK TRAINS OF NORTH AMERICA

by

ALAN VANTERPOOL

Published by the
Alberta Pioneer Railway Association
2010
Edmonton, Alberta, Canada

Published by the Alberta Pioneer Railway Association,
P.O. Box 70014, Londonderry Mall Post Office,
Edmonton, Alberta, Canada, T5C 3R6.

TABLE OF CONTENTS

ACKNOWLEDGEMENTS

MAJOR REFERENCES

ODES TO SILK TRAINS

INTRODUCTION

CHAPTER ONE. SILK: ITS FASCINATION, ITS HISTORY AND ITS PRODUCTION

CHAPTER TWO. FROM FARM TO SHIP

CHAPTER THREE. BUSINESS ASPECTS AND STATISTICS

CHAPTER FOUR. SILK SHIPS ACROSS THE PACIFIC OCEAN

CHAPTER FIVE. TRANSFER OF RAW SILK FROM SHIPS TO TRAINS, AND PREPARATIONS FOR TRANSCONTINENTAL RAIL JOURNEYS

CHAPTER SIX. SILK TRAIN DESCRIPTIONS

CHAPTER SEVEN. SILK ROUTES ACROSS NORTH AMERICA

CHAPTER EIGHT. THE NEW YORK CITY AREA

CHAPTER NINE. THEFTS, ACCIDENTS AND OTHER EVENTS

CHAPTER TEN. THE DEMISE OF SILK TRAINS

APPENDICES

- ONE. Shipments of Silk Worm Eggs
- TWO. Silk Train Myths
- THREE. Great Northern Silk Train Runs, 1925.
- FOUR. Silk Shipments Direct to New York City
- FIVE. Shipment of Bullion.
- SIX. Chinese Travelers.
- SEVEN. Movement of Silk by Train in the New York Area.

ACKNOWLEDGEMENTS

John J. Chalmers, Edmonton, for permission to reprint his father's poem, *Silk Trains*.

Victor Baird, for substantial help on Wabash Railroad silk trains.

John Bromley, Union Pacific Railroad Museum, for information on Union Pacific silk trains.

Jo-Anne Colby, Analyst, Canadian Pacific Railway Company Archives, Calgary, AB, for her prompt, generous and unfailing help in clearing up many obscure points of CPR silk train history.

Herbert Dixon, President of the Alberta Pioneer Railway Association, and General Manager of the Alberta Railway Museum, Edmonton. AB. Herb suggested the topic of silk trains to me and has always been a strong supporter of historical studies on railways.

Tim Dixon, for welcome and essential help with computerese.

Wm. Donlevy, for supplying an article by his father Wm. Donlevy, "The Era of Canada's Silk Trains," from (CNR) Retired Railvets News, Edmonton, 1984.

Bob Glenn, President of the Milwaukee Railroad Historical Association, for Xerox copies of silk train articles from the Milwaukee Magazine.

Harlan and Theresa Hiney, for permission to use the painting of a CPR silk train.

Burr Hubbell for information on silk trains in northern New York State.

Interlibrary Loan Staff, Main Branch, Edmonton Public Library, for borrowing obscure references, and Xeroxing newspaper articles.

Gordon Iseminger, Professor of History, North Dakota State University, for discussions on the internet, and whose article on the Great Northern Railway silk trains in *Minnesota History* provided the model for this book.

Robin Lowrie, member of the Edmonton Model Railway Association, Edmonton, for making the Association's library available and for introductions to his peers on the internet.

Victor Polewsky for help in correcting a number of egregious errors, for help in clarifying the text, and for explaining railway practices.

Gary Tarbox, Northern Pacific Railway Historical Association, for supplying information and for permission to publish photographs.

John Teichmoeller, Coordinator, Rail Marine Information Group, Endicott City, MD, for discussions on the internet.

Ronald Thornton, President and CEO of the Inland Marine Underwriters Association, for clarifying the significance of the 6% insurance premium calculated on an hourly basis for silk train shipments.

Kyle K. Wyatt, Curator of History and Technology California State Railroad Museum, for discussions on the internet.

To my dear wife, Joan, for her unflinching support over the years, and her patience while I spent many hours secluded in my den at the computer, while writing this book.

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ODES TO SILK TRAINS

SILK TRAINS

If you read nothing else in this book, you should read this poem, for it concisely captures the whole essence of silk trains. It was written by John (Jack) W. Chalmers (1910-1998). Jack grew up in Virden MB which is on the main line of the Canadian Pacific Railway.

Back in the nineteen-twenties, when my years were mighty few,
I loved to see the silk trains as by my town they flew.
They never stopped for anything, they had the right of way,
Both east and west bound passengers in sidings had to stay
When the track was cleared for flyers with their cargoes from Cathay.

From Vancouver's dock around the clock,
Through mountains and valleys and plains,
Through summer heat and winter sleet
And spring and autumn rains,
By day and night, in dark and light,
In every sort of clime,
With a flash of red the silk train sped
To reach New York on time.

Express trains went like fifty, but to silk trains that was slow,
For sixty miles an hour or more, was what they'd often go.
We used to say that lightning was the only thing as fleet
As a silk train on a level track, and even it would meet,
If racing on a down-grade stretch, a swift and sure defeat.

Oh, the bell it rang and the rails, they sang
And the drive-rods flashed in the sun;
The whistle blew and the cinders flew
And the wheels and journals spun;
The couplings clashed as the silk trains dashed
By switches and semaphores tall,
For the green light said, "Go right ahead,
You're cleared for Montreal."

The fireman in the swaying cab had to shovel coal like mad,
But he always had the time to wave to a bright-face little lad
Who stood beside the right-of-way, his eyes with wonder wide,
To watch the locomotive, and wish that he could ride
As engineer of a silk train with a fireman by his side.
Oh, their day is past and I've seen the last
Of the fastest trains on the road;
No more they boast from coast to coast,

Of their fragile precious load.
Of the trains I knew – they were quite a few –
They were the ones I loved the best,
And still I hear in memory's ear
The silk trains from the west.

Reprinted by permission from *Silk Trains and Other Poems*, edited by John J. Chalmers, published privately by J.J. Chalmers, Edmonton, 2003.

THE SILK TRAIN

Highball! Highball! She is on her way,
Out of the yards in the twilight gray,
Gathering speed at each turn of the wheel,
Pounding impatiently over the steel,
Her headlight dimming the light of the stars
That, wondering, gaze on the thundering cars,
Clear of traffic the rails tonight,
For nothing may dare to delay the flight
Of a train of silk from Frisco.

Pounding hard up the mountain steep,
Drifting down through gorges deep,
Making the walls of the cañon ring,
As the shriek of the whistles goes echoing.
Highball! Throw the levers, the tracks are clear,
The precious cargo is near – is here!
The mountains crossed, her dangers done,
She throbs with pride at the end of the run –
A train of silk from Frisco!

Author unknown. Reprinted from F. Hubbard, *There Never Was a Signal Set Against a Silk Train*, Railroad Magazine, April 1965, p.p.13 – 24.

INTRODUCTION

Why another book or article on silk trains? Most articles stress the speed, excitement and mystery of silk trains, but give few details of their appearance, operation or performance. The only book on the subject – Webber's *Silk Trains – The Romance of the Canadian Silk Trains or 'The Silks'*, was written 14 years ago and dealt only with Canadian trains. The only other railway covered in similar detail to the Canadian National and Canadian Pacific in Webber's book, is the Great Northern Railroad in the United States. Information on the other 18 or so railways involved in the movement of silk across the North American continent has not been readily available. This volume, tries to cover these gaps, albeit with limited success.

Silk trains were operated in North America between about 1875 and 1935. There are still some people alive, who actually saw silk trains in operation, and more that heard stories about them at their parent's or grandparent's knees. By publishing this book on-line in incomplete form, it is hoped that some will come forward to fill out the gaps in the silk train story.

Commencing in the 1850's, U.S. industry, in and around Paterson, NJ, developed silk processing machinery. By the beginning of the twentieth century the US was pre-eminent in many aspects of the manufacture of silk goods, especially silk stockings. While the Chinese did little to accommodate their silk industry to the US demand, the Japanese did a great deal. The Americans required vast quantities of silk of high and consistent quality. The Japanese succeeded in meeting this demand, and in co-operation with the US industry, came up with mutually acceptable standards. The result was that raw silk became the most valuable export from Japan, by a large margin. Thus, silk exports played a major role in financing the twentieth century industrialization of Japan, and later, its militarization.

The USA purchased the vast majority of the Japanese exports, so that raw silk was by far the most valuable import into North America. Most of it was processed by the 800 or so firms in a 200 mile radius of New York City. There were other, much smaller silk processing operations, in Chicago, Indianapolis, Montreal and Winnipeg, as examples. In the 1930's a number of companies relocated to the south eastern USA.

During the nineteen twenties there were approximately 20 silk trains per month crossing North America from Vancouver, Seattle/Tacoma, Portland, and San Francisco – and later, Los Angeles. Silk was by far the most valuable commodity which railways transported on a regular basis. The revenue from silk transportation was higher than for transporting other goods, and was even higher than for conveying passengers. As a result, many railways went to considerable lengths to obtain and retain this business.

In the following pages there will be a discussion of the production of raw silk, its marketing, and transportation across the Pacific Ocean. Silk train operations and performance will be described in some detail. Finally, there will be some briefer comments on the distribution of raw silk and manufactured silk products in the New York City area, as well as the final processing steps to the finished product.

CHAPTER ONE

SILK: ITS FASCINATION, ITS HISTORY AND ITS PRODUCTION

INTRODUCTION

Silk is one of the oldest fibres known to man. It is also by far the most expensive. Nevertheless it has always been in great demand because of its outstanding properties. Silk is of interest due to its role in "high end" especially for women, and, for its history, leading to the classical silk routes across Asia and to the much less well known and shorter-lived silk routes across North America. Its interest to economists is based on its high price and volume of sales which made it a major contributor to the Chinese and Japanese economies, notably in the nineteenth and early twentieth centuries. Its transportation to North America broke records on trans-Pacific crossings. And silk trains were the fastest steam-driven trains in North America, between ca. 1875 and ca. 1935. Also, because of its high value, it drew considerable attention from thieves and hence of law-enforcement officials and insurance companies.

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THE FASCINATION OF SILK

Silk is inherently expensive since it is made from the cocoons of silk worms. Tens of thousands of cocoons are required to make a pair of silk stockings or a piece of silk fabric, for example. However, silk also has properties which make it highly desirable in clothing such that the high cost can be justified. For example, it has been described as having the following desirable properties:

- great tensile strength and elasticity making it suitable for ladies' stockings legs could be sheathed in the most gossamer of silken hose.
- readily dyed and printed in bright attractive colours
- good absorbency – therefore comfortable to wear in both hot and cold weather.
- can absorb up to one-third of its own weight in moisture without feeling damp.
- has lower density than cotton, wool or nylon
- is stronger than steel of the same diameter, and can resist breakage up to one-seventh of an ounce per filament making it much stronger than cotton or wool.
- rarely affected by mildew, and can be washed in mild alkali and dry-cleaned
- is white, soft, flexible, and lustrous, does not crumple, is hard-wearing
- lightweight, resilient and very strong
- soft, clinging, beautiful, luxurious, lustrous
- smooth hand
- mother of endless loveliness
- nearest to poetry of all commodities
- suggests the liquid caressing smoothness of the Orient

- shimmering beauty
- feminine sensuousness
- perfumed riches
- curtained mysteries
- shrouded in myth
- associated with a romance denied to other business endeavours
- romance of adventure and enterprise, of commerce and barter, of thrones and courtesans
- the queen of textiles
-

Not unexpectedly, silk also has some less desirable properties, such as:

- only moderate resistance to abrasion and wrinkling
- water spots easily
- weakened by perspiration and sunlight
- yellows easily and may lose strength over time
- raw silk is yellowish-white to gold in colour, stiff, rough and lacking in luster
- not fully moth-resistant, but much more so than wool.

Silk's outstanding properties are brought about by its chemical and physical properties. The protein molecules in silk are long and bound to each other by numerous intermolecular bonds. This feature gives silk its strength. These well-ordered portions of the molecules are also interspersed with amorphous fragments which allow for silk filaments to bend stretch, crumple, etc. and return to their original configuration. Thus silk can be woven to produce fine thin diaphanous garments.

Silk filaments are smooth under a microscope, in contrast to other natural fibres which are scaly and have many very short fibre ends sticking out from the main strand. This factor gives silk its fine smooth hand. A silk fibre consists of two fibrils, triangular in cross section. As it emerges from the cocoon the fibrils are kept together by a coating of gummy water soluble sericin. During processing the sericin is removed and one is left with numerous fibrils twisted together to form a thread. But the flat surface of each thread reflects light in an ordered manner, which gives silk its lustrous appearance. Silk can absorb up to 30% of its weight by water before it feels wet – hence one of its comfortable properties when worn.

Silk is unique amongst the natural fibres, and it was not until 1910, that it received any significant competition. In that year regenerated cellulose, otherwise known as viscose or rayon began to be manufactured in the US. This competition eventually became significant at the middle to lower end of the silk market. While rayon's properties were less desirable than those of silk, its low price made some uses competitive with silk. In the early 1920's cellulose acetate began to be marketed. It competed mainly with viscose rayon, again at the middle and lower end of the silk market. The first major competition for silk, from a synthetic fibre, did not occur until 1940, when nylon was first marketed. By that time export of silk from the Orient had fallen off markedly, largely due to the Sino-Japanese War. However, Nylon did not, in practice, become a major commercial competitor to silk until after World War II, because of its high demand for war purposes.

The major factor in the competition with the newer fibres was their cost – measured in cents per pound, rather than in dollars per pound for silk.

END NOTES

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THE HISTORY OF SILK

Chinese legend holds that silk was discovered around 3,000 BC by Lady Hsi-Ling, the teen-age wife of the third Emperor. It is said that while she was taking tea in her garden one afternoon. a silk worm cocoon dropped into her tea. The fibre started to unravel and the Empress realized it could be used to make fabric. Although a silk filament is stronger than steel of the same diameter, it is still very delicate. The Empress learned how to culture silk-worms and is said to have invented a loom with which to weave silk.

Initially silk garments were worn only by the Emperor and his immediate family. Gradually the use of silk spread to courtiers and eventually to the general population. In the space of a few centuries, sericulture became a major contributor to the Chinese economy. At one time silk was used as currency. The Empress' role in sericulture was recognized in naming her the "Goddess of Silk." Even today, there are temples in her name throughout the silk growing regions of China.

Later, silk began to be used in other articles of clothing and for accessories – bonnets, wallets, belts, embroidered articles, etc. It was also used to make fishing lines, strings for musical instruments, bowstrings and paper and in electrical insulation.

Charming as this story is, archeologists believe silk goods were being made in China, 2,000 years before Hsi-Ling's time.

There are over 300 varieties of moth which produce cocoons from silk thread. But very few produce enough silk and enough cocoons to make commercial production viable. It is not clear which variety of moth was cultivated initially by the Chinese, but the domesticated moth used in China and Japan today is *Bombyx mori*. There are also several varieties of plants that silk worms can eat, but the best silk seems to come from worms eating mulberry leaves.

In view of silk's importance to the Chinese economy, stringent measures were put in place to keep silkworm technology, secret.

Nevertheless the Chinese eventually began to ship silk goods to Persia and Arabia by sea, perhaps as early as 3,000 years ago. About 2,300 years ago the fabled silk routes across southern Asia were initiated. They terminated in Turkey, Arabia and Persia. From there, silk spread throughout the Roman Empire. Eventually, the secret of silk-worm culture escaped from China and by around 1,700 years ago, sericulture was being practiced in Japan and Korea. Two hundred or so years later, sericulture spread westwards to Europe. While sericulture can be practiced in many parts of the world it is very labour intensive, to the point that it is only practical in south-east Asia, China and Japan.

During the fourteenth and fifteenth centuries silk weaving became very prominent in Europe, especially Italy and France. By the early nineteenth century, the Americans began to mechanize the manufacture of silk goods and by the end of the century had achieved a world-wide dominance. It was this dominance that helped to give rise to silk trains.

Between 1870 and 1940, raw silk was by far the most valuable export from both China and Japan. It played a significant role in helping China to defend itself in the initial part of the Sino-Japanese War (1937-1945), until the cessation of exports in 1940. Silk exports also helped Japan in its fight with China and in providing the monies to build up its ability to commence the Pacific War in 1941. During much of the period from 1870 to 1941 raw silk was also the single most valuable commodity imported into North America.

By the 1920's Japan had become the world's largest exporter of raw silk and the United States sometimes bought over 90% of this. American processing required a consistent quality of good silk. The Japanese worked very hard to meet this requirement, while the Chinese did not.

For much of the period, the market price for raw silk in the United States varied between $5.00 and $7.50 per pound. At these prices the purchasers of raw silk in the US were prepared to pay the relatively high cost of land transportation in order to achieve rapid delivery. But after the 1929 economic crash, the price fell to $1.50 per pound, caused by the precipitous drop in demand. Consequently, the lower cost of transportation on the all-sea route from Japan to New York City via the Panama Canal, became very attractive. As a result, by the mid-1930's silk trains operations had ceased

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See Chapter Four concerning silk statistics.

THE PRODUCTION OF RAW SILK

The following discussion refers to the procedures used during the period of the North American silk routes, i.e., ca. 1875 to ca 1935. U.S. manufacturers almost exclusively used silk grown in China and Japan.

There are four stages in the life of the moth – moth, egg, worm (really a caterpillar), and cocoon. These will be discussed in turn.

MOTH and EGGS. Silkworm cocoons were carefully examined, and those deemed to be the most healthy were selected for the next generation. The cocoons were individually tested for disease, and if found wanting, were burned.

It takes a little over two weeks for the moth to emerge after a cocoon is fully formed. In sericulture, the moths are hatched on a bed of mulberry leaves. The female moth is larger than the male since she is carrying 300 to 500 eggs. After emerging from a cocoon the moths dry themselves off. Although the moth is flightless, it does have wings – up to about two inches across. It takes about a day for the female to lay all her eggs and for the male to fertilize them. Silk-worm moths do not eat, and live for only four to five days. They are also blind, but have acute smell and hearing. Since they are entirely looked after by silkworm farmers, these deficiencies are unimportant. The eggs are very small – 30,000 to 40,000 per ounce. When first laid they are yellow, but the fertile ones later turn a blue-gray colour.

GROWING MULBERRY TREES

The Union Pacific Magazine, January 1927, p.9

Chinese and Japanese silk worms were fed exclusively on leaves of the White Mulberry – *Morus alba*, which is native to south-east Asia. The tree normally grows to over 30 feet high, but those shown in the picture were pruned to allow easy harvesting of the leaves (see Wikipedia on line).

The eggs were kept for ca. three months at 65°F then gradually warmed to 77°F for a few days, when they hatched. One ounce of eggs (i.e., 28 grams) produced about 30,000 worms, which ate about a half ton of mulberry leaves. If all went well about 20,000 worms survived to the cocoon making stage - producing 130 to 140 pounds of cocoons, from which 12 pounds of raw silk resulted. In nature, there is only one hatching per year but in sericulture there may be several hatchings per year.

WORMS. The dark coloured worms were grown under constant temperature, hopefully in the absence of loud noises, drafts, or obnoxious odours. Any of these conditions resulted in the death of some worms, e.g., from thunderstorms.. The worms grew to about 10,000 times their birth weight in one month, shedding their skin four times. At maturity they were about three inches long and half an inch in diameter. During this time they had consumed about three quarters of an ounce of mulberry leaves. Approximately 70% of the worm's intake of nitrogenous material was eventually converted into the components of a silk fibre.

GROWING SILK WORMS

The Union Pacific Magazine, January 1927, p.9

Silk worms were grown on trays under carefully controlled conditions. In view of the vast quantity of mulberry leaves consumed by the worms there was a prodigious amount of waste generated. Consequently the trays had to be cleaned several times daily and fresh leaves supplied. The baby worms suck the juices from the leaves, while adult worms eat the entire soft part. A tray of eating silkworms, sounds like falling rain.

COCOONS. The worm contains two glands, each filled with a solution of fibroin and sericin. When the worm is ready to create its cocoon these glands each exude a brin, which is a very fine filament of fibroin. The two brins are surrounded in the spinneret in the head of the worm by sericin which coagulates on exposure to air. This binds the two brins together into a continuous filament called a bave. Thus a cocoon consists of a continuous bave, made up of two fibroin brins, stuck together by the gummy sericin. The filament is triangular in shape, which gives rise to the luster associated with silk when light shines on it. The sericin makes up about 30% of the weight of raw silk. It is water soluble, while fibroin is not. It takes about three days for a silk-worm to make a cocoon – which is white or cream coloured.

RAW SILK. The cocoons remaining after those to be used in the next generation have been separated, were immersed in hot water. This killed the pupa inside the cocoon, and loosened the filaments which made up the cocoon. The immersed cocoons were brushed. This released the bave from each cocoon. Several baves were reeled together to form a thread of continuous raw silk. Depending on the final use, two to maybe fourteen baves were twisted together during reeling. In this process the sericin became softened and some was lost. But after the thread formed and dried the sericin hardened again and bound the thread together. Its diameter was around 0.0005 inches.

The unwinding of the cocoon is called reeling, whereby a number of threads are bundled together into a hank (also called a skein). The Chinese reeled by hand which gave a variable quality. The Japanese reeled mechanically in a factory called a filature. Filature silk was of consistent quality, especially desired in U.S. silk processing. The length of filaments varied from around 300 yards feet to over 1,000 yards. The filaments were reeled into skeins. These weighed from 2.5 to almost five ounces. They were kept at 20 to 23°C and 65 to 75% relative humidity for several hours to provide the proper moisture level to the silk. Twenty to 30 skeins were then assembled into books. Twenty-two to 30 books were then bundled together into a picul – called a bale in North America.

The bales were wrapped in heavy paper, raffia, jute or rattan and stoutly tied. Each bale was identified by number, and before shipping, by destination and consignee. Chinese bales often had a chop mark, which identified the firm which supplied the bale. The chop mark was intended to be a guarantee of quality. A bale measured three feet by two feet by 18 inches.

The initial and final portions of the thread spun in the cocoon are irregular in diameter. Considerable expertise was needed to identify the main portion of the filament, which is of constant diameter, for this is the best silk. The constant diameter filament may only be 400 yards long and this, as the most valuable product, is reeled. The remainder - waste or floss – can still be used, by carding and spinning, much as wool is spun. The silk from substandard cocoons, or cocoons from which the moths have hatched, are treated similarly. This silk was often converted to manufactured products, for domestic sales and export. When exported, the goods were packaged in boxes lined with water resistant paper or tin foil.

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CHAPTER TWO

FROM FARM TO SHIP

There was a substantial difference in the organization of silk farming in China and Japan, so they will be considered separately.

CHINA

There appears to have been very little specialization in silk production in China. Individual farmers did everything up to and including preparing skeins of raw silk. The final stage, referred to as reeling, was done by hand. The skeins were sold to the local "hong" or silk warehouse, where they were packed into bales. They were transported there in several ways. One was by carrying it in packages supported at the end of horizontal poles carried on a coolie's shoulders. Or it could be wheeled in barrows or packed on the backs of donkeys. Larger amounts were floated down water courses on sampans, junks or river steamers.

MOVING SILK FROM FARM TO SHIP IN CHINA

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Union Pacific Magazine, January 1927, p.8

Railroad Magazine, April 1965, p. 24

In the picture on the left, the raw silk has been hand reeled and made up into packets, on a silk farm. It is being readied for delivery to the local hong (i.e., silk warehouse), by sampan. The picture on the right illustrates one of the methods to transport raw silk, by land, to a portside warehouse prior to shipping overseas.

The bales were then moved to either Canton or Shanghai where they would be purchased by silk brokers. The brokers were westerners who were resident in China. They formed relationships with Chinese intermediaries who negotiated with the hongs. Since contract law was very primitive, the broker and intermediary had to have a trusting relationship, and the mark-up in their transactions was consequently very high.

Silk warehoused in Canton, was moved to Hong Kong by river steamer. These were brought alongside ocean going vessels moored in the harbour. The bales were hoisted aboard the trans-Pacific vessels by the ship's own hoisting machinery.

In Shanghai the bales were wheeled to the river jetties. They were loaded onto steel lighters and moved to the trans-Pacific ships, which were moored in the harbour. The ocean going ships loaded themselves with their own hoisting machinery.

Bales of Chinese silk were often of irregular quality. As such the silk could be used to weave fabric for dresses, neckties and piece goods. But it could not be used for making hosiery, which was by far the biggest end use in the USA. As a result the Chinese lost business in the US and sold the bulk of their exports to Europe. The hand looms in common use there were able to deal with varying quality better than the US's mechanical processing equipment.

As one might expect, a substantial proportion of the silk produced in China, was used domestically. Some of this, in the form of fabric was also exported, and was referred to as manufactured or broad silk.

JAPAN

For much of the nineteenth century the Japanese used a similar process to the Chinese to get their silk aboard ship. However, Japanese companies and co-operatives later began purchasing silk to their own account and transported it to New York/Hoboken for sale to American processors. By the middle of the nineteen thirties this was the predominant system.

In 1886 Japanese exports of raw silk to the USA exceeded that to Europe for the first time. By 1913 the US was importing twice as much as Europe.

By machine reeling silk (in contrast to hand reeling) Japan was able to meet the demands of the US market. This came about as a result of a combined effort of the Japanese government and industry and the results of research. In 1893, the Yokohama Raw Silk Company opened, to engage in the silk trade with the USA. This was followed by Mitsui Bussan in 1896 and Hara Gomei Enterprises in 1901. Trade financing, export-import insurance, and Pacific freight services were developed by Japanese nationals. By 1912 these Japanese companies handled 50% of the total silk exports. By 1914 about 70% of Japanese raw silk production was exported (10,208 tons). Silk production reached a maximum in 1935 (33,189 tons was exported), but thereafter silk production declined sharply.

Japanese raw silk came in several grades. The two lowest grades were "Best Number One" and "Best Number One Extra." The two highest grades were "Grand Double Extra" and "Grand Double Extra Crack." The grade was stamped on each bale. The business of judging silk quality in the US was undertaken by the United States Testing Company, of Hoboken, NJ.

By the 1920's major wholesalers were responsible for most of the movement of raw silk within Japan. Four wholesalers controlled about 75% of the business transacted. One firm, Katakura, as an example, owned nine egg producers, five reeling firms (also known as filatures), testing

laboratories in Yokohama and several inland centres, and an office in New York City. Consequently, many farmers bought silkworm eggs from a wholesaler, hatched the eggs, nurtured the silkworms and sold cocoons to a wholesaler. The wholesaler hatched the cocoons, reeled the silk thread, graded it, made up skeins, and packed them into bales, for shipment abroad. These transactions were financed by local and city banks, and by credit extended by a wholesaler. By 1910, banks were responsible for about 75% of the financing, while wholesaler's loans supplied the rest of the monies required. The Japanese Government stood behind the banks and was responsible for much of the financing of the silk trade.

In the 1920's, of the raw silk exported world wide, Japan provided over 85%, and, the United States imported up to 95% of this.

There was not always a steady supply of silk to North America. For example, in 1903 there was a war scare involving Japan, and there was an expectation that silk shipments to the USA would be compromised. The major concern was that the banks would call their loans to silk importers, and sell the silk at distress prices. One importer, advised their agent in Japan not to ship silk in Japanese vessels. There does not appear to have been a similar scare with the outbreak of war between Japan and Russia in 1905.

In September 1923 there was a major earthquake in Japan. As a result, the price of raw silk started to fluctuate widely. On September 7 the price was $7.70 per pound. On the 10th it was $9.00 and later that day it went to $11.00. The American Silk Association suspended trade to try and halt the price swings. In July 1923, 23,400 bales of Japanese silk were delivered to the USA. It was estimated that 16,800 bales of Japanese silk were in manufacturer's inventory in the USA in early September, with a further 45,000 warehoused in the USA. It was estimated that up to 40,000 bales were in storage in Yokohama. The E. Gerli company in New York also stepped into the Japanese silk market, and stabilized it (by buying 7,000 tons of silk), after the big earthquake had caused deliveries to stop for two months.

There do not appear to have been any serious delays in delivery due to maritime accidents.

Throughout much of the 1920's the value of a bale of silk varied between $640 and $1,000. However around 1920, the spot price reached about $2,000 per bale, and after the 1929 stock market crash it declined to less than $200 per bale. Chinese silk was often valued around $650 per bale. Manufactured silk was worth about $2,000 per case. The owner of each bale paid for the cost of transportation and insurance, from the port of exit to the stock exchange.

SHIPPING AND STORAGE OF RAW SILK

Most silk bales ifrom the Orient weighed one picul which worked out to 60.5 kilograms or 133 1/3 pounds. Cantonese bales weighed 106 2/3 pounds. Incidentally, the standard sized European bale weighed 220 pounds. Bale weights could be within ± 5% of the stated weight. (Jo-Anne

Colby, CPR Archives, by e-mail, September 18, 2008; anon. "The Value of Conditioning, United States Silk Conditioning Company, New York, 1908).

In the 1930's the Canadian National Railway was recording weights of silk by the "piece." A piece weighed 175 pounds (Webber, loc. cit., p.117).

Silk bales had to be protected from moisture, since silk can pick up over 30% of its weight of water. But, in doing so, it swells (up to 40% by volume) and can break its packaging. Silk bales could not be handled with hooks or any sharp instruments. They were stored in such a way that they could not slip while being transported as that could damage the packaging.

Storage areas had to be dry and clean, away from sources of heat, dampness and water, in areas free of oily patches, and where pipe-work was leak proof. The bales could not be stored against sharp edges or rough surfaces. The temperature could be between 0 and 30° C (preferably 20°), with humidity of 65-70%. If the packaging was broken, the silk could develop mildew, mold, and a musty smell.

While silk has no odour itself, it can pick up smells from hides, furs, foodstuffs and feedstuffs. It can be contaminated by colourants, dust, ores, rust and leakage from other cargo such as molasses, animal glue, fats, oils, and lubricants. Storage spaces must be free from rats (they knaw at bales), and insects (they may lay eggs on silk). Any wood in contact with silk bales had to be seasoned so as to be free of insects.

The reference for the foregoing three paragraphs is from the Transport Information Service on the internet at http://www.tis-gdv.de.

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CHAPTER THREE

BUSINESS ASPECTS AND STATISTICS

BUSINESS ASPECTS

CHINA. In 1920 the silk industry in China was concentrated in the Pearl River in the south east of the country. It involved 408 square miles of mulberry tree farms which produced over 31 million piculs of mulberry leaves (i.e., 1.8 million long tons). There were two million sericulturists, who produced 444,000 piculs of cocoons, which resulted in 88,000 piculs of raw silk. To serve this industry there were 45 silkworm egg markets, 36 cocoon markets, 160 steam filatures, and 18 raw silk markets. The former small-scale silk industry, had by now been replaced by a mass production system to better meet the needs of export trade J. Sherman, *Silk in China Circa 1840: The Introduction of the Worldwide System to China's Silk Industry,* find in Google under the title

International trade requires forward orders, advances and deposits, reliance on samples, risks in transport and storage, and credit. All these steps require trust. In most western countries the necessary degree of trust is produced by the law of contract, enforceable in independent courts. In China, trader trust depended on family and clan loyalty, as there was no law available. Initially, the situation in Japan was similar, but later laws similar to those in western nations were introduced (J.J. Spigelman, *The Foundation of Western Shanghai*, see Google on the internet under this title).

No Chinese silk merchant would sell directly to a Western trading house. Each trading house had to appoint a Chinese to act as its agent and intermediary with local traders. As far as Chinese businessmen were concerned, these "compradors," accepted responsibility for the Westerners behaviour. In turn, to the Western trading firm, the comprador accepted responsibility for the actions of Chinese merchants. These responsibilities were formalized by written third party guarantees backed up by cash performance bonds. In effect, the comprador provided the Western trading firm with fruitful relationships with Chinese suppliers. (Spigelman, loc. cit.).

In effect, the comprador was a risk broker. All transactions, both monetary and physical, passed through his hands. His income, came from commissions and/or in differences in rates of exchange. Traditional interest rates in China, were 40 to 80% per annum. Consequently, the comprador had a great deal of room within which to maneuver (Spigelman, loc. cit.).

Partly due to the individually small operations, Chinese quality control was poor. Many firms reeled silk from diseased cocoons. Also, as noted earlier, most Chinese silk was hand reeled and was thus of variable quality. Furthermore, the Chinese Government was not alert to economic matters, and in any event was not administratively competent. As a result, the US mills over time used a smaller and smaller proportion of Chinese silk, versus Japanese silk (G.C. Allen and A.G.

Donnithorne, *Western Enterprise in Far Eastern Economic Development*, Allen & Unwin, London, 1954).

JAPAN.

Japan commenced international trading in the 1860s. From then until the late 1930s, Japan derived most of its export earnings from raw silk, mostly used to manufacture articles of women's clothing. In 1929, the peak year of production, 2.2 million Japanese farm households were engaged in the industry. Raw silk exports were $363 million that year, almost all of it to the United States (E.S. Miller, *Bankrupting the Enemy. The U.S. Financial Siege Before Pearl Harbor*, United States Naval Institute Press, Annapolis, MD, 2007. ISBN-13: 9781591145202).

Japan developed its position in world silk manufacture by introducing scientific sericulture. Mulberry tree acreage rose 157% from 1890 to 1929, to 1.5 million acres, or 10% of Japan's arable land. Initially, it was a one crop per year industry, but by 1929, three crops per year were being obtained. From 1889 to 1929 cocoon productivity rose 271%, and a cocoon yielded 40% more silk in 1929 than it did in 1890. This was achieved by constructing sanitary cocoon warehouses, breeding improved silk worms, and by destroying diseased worms. As well the silk winding operation had been almost completely converted from a hand operation to a machine operation, thereby providing a much more consistent product (Miller, loc. cit.).

By 1929 Japan supplied two-thirds of the world's silk exports. The country had successfully utilized its first class work force and second class arable land into a substantial generator of foreign exchange. Silk, in all its forms, made up about 55% of Japan's foreign exchange earnings (Miller, loc. cit.).

The economic crash, late in 1929, had a catastrophic effect on Japanese sericulture. Many silk farmers and their families became destitute and malnourished. The Government had always played a significant role in silk production, but after 1929, it expanded its role substantially in an attempt to alleviate the situation (G.E. Hubbard, J Hunter, *Eastern Industrialization and Its Effect on the West*, Routledge, 2000. ISBN-13: 9780415218184; Miller, loc. cit.).

By the beginning of the 1920s, the export of most Japanese raw silk had passed out of the hands of westerners, and was largely in the hands of the Japanese themselves. Only 16% of the raw silk exports involved non-Japanese traders at this time. However, most manufactured silk goods exports were still in the hands of foreign houses, since their better understanding of western tastes gave them an advantage over Japanese exporters (Allen & Donnithorne loc. cit.).

In the season from July 1, 1921 to June 30, 1922, the total shipments of raw silk from Yokohama amounted to 309,823 bales. Of this, 279,151 bales (i.e., 70%) were exported to the United States. This was the largest amount ever exported from Japan, and was responsible for the high prices currently realized. Visible stocks at Yokohama amounted to 14,000 bales (*Raw Silk Markets*, New York Times, July 16, 1922, p. E11).

Between March 1929 and February 1930 the price of raw silk dropped by 39%. In the next year or so, it dropped to around a quarter of what it had been in 1928. The Japanese Government began to enforce the existing laws to guarantee the silk co-operatives against losses incurred in loans, in an attempt to stabilize prices, Large amounts of raw silk were also taken off the market. In 1932 the Government bought the entire year's production for example, and in 1936 they bought about 10% of the annual production (Hubbard, Hunter, loc. cit.).

The *Raw Silk Association Law* was greatly strengthened to give power to the co-operative societies and associations in all branches in all branches of the silk industry. Six branches of the industry were identified – silk worm raising, silk worm egg production, co-operative silk reeling, independent silk reeling, raw silk marketing, and raw silk production. As a result of the legislation, a *Central Raw Silk Association* was established, to co-ordinate the activities of these six groups. The Association was successful in achieving a rationalization of the industry – the quality of the products were standardized and improved, as were the production processes and methods of trading. As part of this process, reelers were licensed commencing in 1932. Commercial reelers were discouraged from expanding or building new plants, while co-operative reelers were encouraged (Hubbard, Hunter, loc. cit.).

In 1934 the *Silkworm Egg Control Law* was passed. Producers of silk worm eggs were now supervised and licensed. That same year the Government took 220,000 acres of mulberry trees out of production, and replaced a further 85,000 acres of poor quality trees with higher quality ones. Also, 45,000 acres were planted with a mixture of mulberry trees and other species. Two other pieces of legislation were introduced – the *Export Raw Silk Marketing Law* (licensed wholesale dealers) and in 1937, the *Raw Silk Price Stabilization Law* (introduced measures to reduce price fluctuations) (Hubbard, Hunter, loc. cit.).

As noted elsewhere, the Japanese Government also encouraged raw silk exporters to ship their product in Japanese vessels, via the Panama Canal directly to the New York City area. One example was the Mitsui Bussan Kaisha shipping line. Much of the raw silk carried by the line was supplied from reeling plants owned by the shipping company. The silk was financed by the Mitsui Bank, stored in Mitsui warehouses, handled by Mitsui stevedoring companies, and involved Mitsui's overseas agencies (Allen & Donnithorne, loc. cit.).

The sale of silk, played a major role in Japan's change from an emerging economy to an industrialized one. It helped the country to recover from the devastating earthquake of 1923, and to procure the strategic metals and oil, it now required. It helped to finance the Sino-Japanese War after 1937 and to prepare for the Second World War. But, the outbreak of War in Europe in 1939, led to an irrevocable collapse in the Japanese economy. Non-dollar currencies were no longer available to Japan. The country was now totally dependent on dollar-bloc currencies, i.e., United States, Canada, South America and the Philippines, if it was to continue its empire building policy.

UNITED STATES

By 1929, raw silk from Japan made up the largest imports into the U.S. by value. The U.S. silk industry had learned how to deal with product substitution, and shocks caused by changes in fashion. They had designed unique manufacturing machinery for silk products, and developed electric cutting and sewing machines in the garment industry. The marketing system was well designed to cope with the capricious fashion industry. Women's clothing made up 90% of the U.S. demand for silk. The U.S. industry learned how to weave broad silk up to 54" wide in spite of the propensity for fine silk threads to break (Miller, loc. cit.).

In 1924, $327.6 million of silk was imported into the United States. This represented 9.4% of total imports and was the second largest commodity to be imported. In 1927, raw silk was the most valuable commodity imported, at $390.4 million. Two years later, in 1929, $427.1 million was imported (9.7% of total imports by dollar value), 50% more than coffee which was in second place. First place position for silk continued into 1930 (A.H. Korndorfer, *National Raw Silk Exchange, Inc*., Annals of the American Academy of Political and Social Science, Vol. 155, Part 1, Organized Commodity Markets, (May 1931), pp. 146-150).

In 1928, 95% of the raw silk imported into the USA, from the Orient, entered through west coast ports.This silk was moved east, by rail. By 1939, Japanese steamship lines handled over 90% of the silk trade and delivered their raw silk directly by sea to the New York City area (W. Radius, *US Shipping in Trans Pacific Trade, 1922-1938*, Stanford University Press, 1944).

Before the First World War the United States purchased around 80% of Japan's silk exports. By the late 1920s they purchased 95% of it. This increase took place in spite of three competing factors.

Cost – silk cost five times more than wool and twenty times more than cotton. After the 1929 depression, many women switched to lower priced fabrics, from silk.

Price variability – before the First World War the price of silk varied between $3.00 and $4.00 per pound. As a result of wartime shortages it went to $9.00 per pound in 1919 with a peak spot price of $17.00 per pound. In 1921 the price fell to $4.00 per pound and then rose to $6.00 to $7.00 from 1923 for the rest of the 1920's. It fell to $1.27 per pound in 1934, but rose to $3.00 to $4.00 per pound in 1939-1941.

Competition from rayon – by 1930 U.S. rayon production was 50% greater than silk imports by weight, but U.S. silk consumption, at 87 million pounds in 1929, had risen 70% since 1920.

Changes in fashion – in 1906, dresses often required up to 13 square yards of fabric. In 1910, only 10 square yards were required, and by 1929, it was down to two square yards! This factor, along with the depression, devastated the broad silk market.

What partially saved the situation was improvements in the manufacture of silk stockings – brought about by improved technology in throwing and, in knitting leading to full-fashioned

hosiery. But consumption only rose to $100 million (from $72 million in 1934) partially due to the increasing use of rayon for the feet and welts of silk hose. By 1941, hosiery consumed 90% of U.S. silk imports, or 60% of total world consumption (Miller, loc. cit.).

STATISTICAL TABLES

Table One shows the exports of raw silk from China and Japan from 1871 to 1935 – the period during which silk trains operated in North America. Obviously, China was pre-eminent up until 1911 to 1915 when Japanese exports rapidly overtook Chinese ones. Thereafter, Japan never lost its supremacy.

Some Chinese raw silk was of very high quality, but in general the quality was quite variable and often the silk bales were significantly contaminated with extraneous material. On the other hand Japanese raw silk, by agreement with American customers, was carefully graded, the quality within a bale was consistent, and contamination was minimal.

TABLE ONE

RAW SILK EXPORTS FROM CHINA AND JAPAN (1)

Five Year Averages in Thousands of Kilograms **YEAR**	**CHINA**	**JAPAN**
1871 to 1875	4,092	672
1876 to 1880	4,416	984
1881 to 1885	3,804	1,488
1886 to 1890	4,822	1,992
1891 to 1895	6,084	3,084
1896 to 1900	6,708	3,132
1900 to 1905	6,900	4,944
1906 to1910	7,500	7,152
1911 to 1915	8,268	10,404
1916 to 1920	7,716	14,148
1921 to 1925	8,772	20,160
1926 to 1930	10,212	30,708
1930 to 1935	5,052	31,872

(1) L.M. Li, loc. cit.

Imports of raw silk into the United States are recorded in Table Two. It is obvious that Japan dominated this market, especially in the later years. Also, in comparing tables One and Two, it is apparent that the United States imported the majority of the exported Japanese raw silk. In the five year period 1931 to 1935 these US imports amounted to just over 90% of Japanese raw silk exports. By value this amounted to 33% of all Japanese exports. The value of manufactured silk exported, amounted to another 10% of all exports. Thus, raw and manufactured silk exports were the major revenue earners for the Japanese economy.

The first raw silk from Japan imported into the USA was in September 1876. In that year 108 bales were imported. There were around 20 silk merchants in the US then, and about 30 silk mills. The value of the silk was about $600.00 per 1,000 pounds. It was used to make ribbons, handkerchiefs, and dress ornaments. Up to this time the quality of Japanese raw silk was quite variable. In 1877 the first industrial silk co-operatives were created in Japan which consolidated the procurement, reeling, packaging, shipping and quality control. Japanese silk soon became known for its consistent quality. Also, Japanese silk traders rapidly took over the trade from western merchants and soon dominated the trade (Reischauer, loc. cit.).

TABLE TWO

RAW SILK IMPORTS INTO THE UNITED STATES (1)

Five Year Averages in Thousands of Kilograms

YEAR	FROM CHINA	FROM JAPAN	TOTAL
1892 to 1895	910	1,600	3,222
1896 to 1900	1,225	2,063	4,265
1901 to 1905	1,414	3,223	6,473
1906 to 1910	1,787	5,224	8,924
1911 to 1915	2,583	8,477	12,305
1916 to 1920	3,265	12,509	16,329
1921 to 1925	4,082	19,063	24,600
1926 to 1930	5,131	28,609	34,949
1931 to 1935	1,468	28,866	31,200

(1) L.M. Li, loc. cit.

In 1909, the world production of silk was around 55 million pounds, about two-thirds of it from the Orient. Of this, China exported 15 million pounds (total production in China is not known due to poor record keeping). About 4 million pounds was produced in India and south-east Asia. The USA consumed about half the world production of raw silk – 24 million pounds valued at about $80 million.

By 1914, Japan had 40% of the world trade in raw silk, China about 30% and Italy 20 to 25%. By the late 1930's, Japan supplied about 90% of the world's raw silk, up from around 75% a decade earlier.

By 1900 over 50% of silk was machine reeled, and by 1915 over 90% was.

By 1910 the United States silk industry was the largest in the world, having overtaken Italy. The United States consumption of raw silk was 36% of the world total in 1907 to 1910, rising to 58% in 1930 to 1937. In 1900, the United States was the number one raw silk importer, with 25% of the world trade.

From around 1896 to around 1912 the price of raw silk varied from $5 to $7 per pound. From 1914 to 1929 the price was $5 to $12 per pound until the economic crash late in 1929 when it fell to $4 per pound. From 1929 to 1937 the price was around $1.50 per pound. In any given period, spot prices could be much higher – for example at one point in 1920 the price was $18 per pound (Iseminger, loc. cit.).

On December 1, 1924, the stocks of raw silk in New York were the largest ever experienced to that date – 55,516 bales – over 11,000 bales more than the month earlier. Over 44,000 bales were imported in November, and just under 32,000 bales were delivered to mills (*Record Stocks of Raw Silk*, New York Times, December 5, 1924, p. 38 of the Wholesale Market Section).

In 1929 about 520,000 bales of raw silk, worth over $325 million, were unloaded at the four west coast ports. The percentage of the total shipments arriving at the individual ports were 44.5% at Seattle/Tacoma, 27.7% at San Francisco, 25.7% at Vancouver and 2.0% at Portland. The railroads involved in the movement had an income of over $6 million from this business (see Table Three below).

One 133 pound bale of raw silk, at $8.50 per pound was worth over $1,000. The value of the silk in a car holding 35 long tons would have been $666,000, and in a 12 car silk train, it would have been almost $8 million.

TABLE THREE

NUMBER OF BALES OF RAW SILK LANDED AT NORTH AMERICAN PORTS, 1923 TO 1929 (1) (2)

YEAR	SEATTLE (3)	VANCOUVER	SAN FRANCISCO	NEW YORK via SUEZ CANAL	NEW YORK via PANAMA CANAL
1923	186,450	93,687	55,645		
1924	248,013	88,411	49,043		
1925	277,624	108,698	103,312		
1926	256,440	119,070	107,240	17,512	1,105
1927	241,131	154,140	117,900	19,959	16,640
1928	245,278	143,845	132,634	8,695	31,319
1929	231,998	133,796	144,216	12,224	116,496

(1) Data supplied by the Silk Association of America Inc. as recorded in *Handling Silk*, loc.cit.
(2) In 1929, 10,438 bales were landed at Portland, Oregon.
(3) These figures presumably include silk landed at the Port of Tacoma as well.

TABLE FOUR

RAW SILK IMPORTS INTO WEST COAST PORTS 1924 TO 1933(1)

In thousands of bales

Year	Seattle	San Francisco	Vancouver	Los Angeles	Portland	Estimated Rail Earnings in millions of $ (2)
1924	248	47	87			4.8
1925	232	99	128			5.8

1926	253	107	115			6.1
1927	241	118	154			6.5
1928	245	133	144			6.6
1929	232	144	134		10	6.6
1930	120	110	101	7	2	4.3
1931	74	70	77	10		2.5
1932	71	63	69	19		1.9
1933 (3)	6	4	4	1		0.1

(1) Prepared by the Traffic Bureau of America. RG 30 CN Records National Archives of Canada, in Webber, loc. cit. p. 71. Note that the figures in this table do not always agree with those in the preceding one.
(2) The rail rate for 100 pounds of baled raw silk from west coast ports to the New York City area was $9.00, except for 1932 and 1933 when it was $6.00.
(3) For January, February and March only.

TABLE FIVE

RAW SILK IMPORTS INTO NEW YORK CITY VIA OCEAN ROUTES (1)

In thousands of bales

Year	Via Panama Canal	Via Suez Canal direct	Suez Canal Via Europe
1924 (2)	<1	<1	5.8
1925	13	8	10
1926	8	11	6
1927	17	20	3
1928	32	9	4
1929	116	12	12
1930	190	2	17
1931	351	<1	23
1932	312		14
1933(3)	83		1

(1) Prepared by Traffic Bureau etc (see reference 1 in preceding tables)
(2) The Orient to New York City ocean freight rate for baled raw silk was $9.00 per hundred pounds, until 1929 when it was reduced to $6.00.
(3) For January, February and March only.

Between 1913 and 1930, the import of raw silk into San Francisco increased from $24 million to $54 million annually.

END NOTES

1. L.M. Li, loc. cit.
2. D. Ma, *The Modern Silk Road: The Global Raw Silk Market, 1850 to 1930*, Journal of Economic History, Vol. 56, #2, June 1996, pp. 330 to 355.
3. *Handling Raw Silk*, loc. cit.
4. Dayton, loc. cit.

5. Tate, loc. cit.

CHAPTER FOUR

SILK SHIPS ACROSS THE PACIFIC OCEAN

Travel by ship across the Pacific Ocean developed much more slowly than that across the Atlantic Ocean. This was partly due to its much greater size, but also to the small population on the west coast of North America. In 1869 the first railway reached the west coast, from the eastern U.S. The railway had to traverse hundreds of miles where population was sparse. Thus trans-Pacific ships calling at west coast ports, and the North American transcontinental railways, had to depend on each other for traffic. It was not long before some steamship companies came under the control of railways. This situation was to last until the First World War. By this time population and industrial growth in the western part of the continent and on the Pacific Coast had built up to a point where shipping companies and railways could profitably operate more independently of each other (J.H. Kemble, *The Transpacific Railroads, 1869-1915*, Pacific Historical Review, Vol. 18, #3, August 1949, pp. 331-342).

Until the Seattle/Tacoma area opened up in the 1880's, San Francisco was the only significant port on the west coast. Most trans-Pacific shipping sailed from China (Hong Kong, Shanghai), and by the 1860s, from Yokohama and Kobe via Cape Horn to New York or Europe. Alternatively, ships sailed from the Orient to the Panama Isthmus, where they were unloaded, passengers and goods traveled by land across the Isthmus, and re-embarked on the Caribbean side, for onwards travel by sea to their destination. The land portion of the Isthmus trip was greatly eased by the completion of the Panama Railroad in 1855 (Google – *Crossing the Isthmus of Panama before the Canal*). Over time, many Isthmus bound ships traveled there via San Francisco where they disembarked passengers and relatively small amounts of cargo. It is unlikely that raw silk was landed in North America at this time, but small amounts of manufactured silk undoubtedly were.

Raw silk was also transported to the New York area, from the Orient, via the Cape of Good Hope. In other cases the silk was fist delivered to a British port and trans-shipped to a trans-Atlantic vessel. After 1869, most silk from the Orient to Europe traveled via the Suez Canal. Even after the completion of the first transcontinental railroad in the U.S. relatively small amounts of silk continued to be imported to North America via the trans-Atlantic route (see Appendix Seven).

Amongst the first cargos landed in San Francisco after the arrival of the railroad, was raw silk - at best, enough to load one railroad car. This car was usually attached to a passenger train to be

delivered to the New York City area. However, by the mid 1870's enough silk was carried by one ship, to fill four or more cars. These were hauled by one train – so the silk train was born. The Southern Pacific Railroad seems to have been the leader in this development.

Around 1870, sailing ships were replaced by iron (and later, steel) hulled side-wheel steamships, equipped with auxiliary sail power. Steel hulled, coal burning, propeller driven vessels were in common use by 1890. In 1869 Japan was a minor exporter of raw silk, but was a major one by 1900. By this time silk was by far the most valuable commodity that crossed the Pacific Ocean in bulk (Hubbard, loc. cit.).

When vessels left Shanghai, their departure was cabled to San Francisco, with the message crossing Russia, Europe, the Atlantic Ocean and the continental United States, to west coast ports. Japan was connected to this system in 1882 (Google, *Danish Monopoly on Telegraph in Japan*). Direct trans-Pacific cable between Japan and San Francisco was not completed until 1906 (Google, *Atlantic Cable*).

By 1900 the steamship-rail competition on the Pacific Coast was as follows:

The UPRR family controlled three routes – The Pacific Mail Steamship Company via the Isthmus of Panama; the Southern Pacific Railroad Sunset Route; and, the overland route via Ogden UT involving the UPRR itself and its subsidiaries (M. Klein, *Union Pacific: The Rebirth 1894-1969.* Volume 2, Doubleday New York, 1989. ISBN 0385177356).
The American Pacific Steamship Company routed via Cape Horn.
The Northern Pacific Railway, commencing from Puget Sound in 1883.
The Canadian Pacific Railway, commencing from Vancouver BC in 1887.
The Great Northern Railway, commencing from Puget Sound in 1893, (closely related to the Northern Pacific).

The following three railways became involved later:

Chicago, Milwaukee, St. Paul and Pacific Railroad commencing from Puget Sound in 1909.
Western Pacific Railroad commencing from San Francisco in 1909.
Canadian National System commencing from Vancouver in 1925.

The use of radio by trans-Pacific ships lagged its use on trans-Atlantic ships. By the end of World War One in 1918, most vessels in the silk trade had radios. Consequently port authorities and the railways were able to estimate within an hour or two when ships would dock. The information conveyed included the number of bales of silk, their total weight, in which holds the silk was stored, the number assigned to each bale, and its North American destination (*Handling Silk*, loc. cit.).

In 1914 trans-Pacific operations comprised 14% of the United State's foreign trade. It involved the steady trade of 50 ships, many of which operated on regular schedules. Thirty-three of these

ships were owned by lines controlled by railroads. It can be assumed that most, if not all, of these carried raw silk at one time or another (Kemble, loc. cit).

Seattle/Tacoma and Vancouver bound ships stopped at William's Head, off Victoria BC, where customs officers, shipping company and railway company officials boarded the ship. They completed the necessary paperwork before the ship arrived at its final destination in North America (*Handling Silk, loc. cit.*).

By the end of the nineteenth century, the majority of the raw silk destined for New York City arrived there via west coats ports. During the 1920's an increasing proportion arrived via the Panama Canal. After the economic crash in 1929, this proportion rapidly increased, and by 1935 most silk train operations had ceased. The few silk shipments landed on the west coast went east as head end traffic, mainly to destinations other than New York City see Appendix Seven).

In 1929, nine steamship companies were involved in carrying silk across the Pacific Ocean (*Handling Silk.* loc. cit.).

In the mid 1930's the Japanese introduced 50 fast new diesel powered ships to the trans-Pacific silk trade. They had eight watertight bulkheads with cellular double bottoms for fuel oil and ballast, and with a hull shape that facilitated speed through heavy seas. They could reach Los Angeles in 12 days from Yokohama. The average monthly movement of raw silk to the USA from Japan was 40,000 bales with a price range of $1.20 to $2.35 per pound. About 20% of Japanese raw silk production was consumed in Japan, while most of the exported silk went to the USA (*Silk Now Comes to America by Fast Motorship*, Morning News, Florence SC, April 3, 1935).

Vancouver and Seattle/Tacoma have an advantage over other west coast ports in that they are closer to the Orient –about a day shorter than San Francisco. Some railway companies owned shipping companies. And most railway companies had some sort of an arrangement with a shipping company to accept raw silk. Yokohama to Vancouver is 4,262 miles, and to San Francisco, 4,536 miles. (This 274 mile difference amounts to a 23 hour longer journey for a 12 knot ship, and a 16 hour longer journey for a 17 knot ship) (Tate, loc. cit,).

One aspect of the need for speed is summed up in the following. On a sailing in mid 1892 on the *Empress of Japan*, the interest cost alone on a consignment of silk was estimated at $80.00 per 24 hours. (The consignee had obviously borrowed money to pay for the raw silk in transit). The CPR General Traffic Manager, Mr. G. Olds, used this fact in a letter to Vice-president T. Shaughnessy, to express the need for speedy transport of silk between Vancouver and consignees in New York City (Webber, loc. cit., pp. 110-111).

DELIVERY TIMES

A study of the speed of silk deliveries for the 18 months up to December 1924 was undertaken for US railroads. The best time from Yokohama to New York City was 13 days, four hours and 50 minutes. The fastest crossing of the Pacific Ocean was realized by the S.S. *President Grant*, which reached Seattle eight days, 23 hours and 10 minutes out of Yokohama. The quickest run

from Seattle to Chicago was 60 hours 40 minutes, on the Northern Pacific, and Chicago, Milwaukee, St. Paul and Pacific Railroads. The New York Central achieved the fastest run from Chicago to New York City in 23 hours 25 minutes (*Shows Speeds of Silk Shipments*, New York Times, December 5, 1924, p. 38 Market Section).

THE SHIPPING COMPANIES

Commencing in 1895 the Oregon Railway and Navigation Company (OR&NC) entered into a number of agreements with shipping companies. Due to failure of the shipping lines none of these agreements was effective for very long (Tate, loc. cit.). (The OR&NC reached Portland in 1882 and Seattle in 1889. In 1886 it became a subsidiary of the Union Pacific Railroad, http://pnwc-org/oregon-rr-history.html; Kemble, loc. cit.).

ADMIRAL ORIENT LINE (also called the American Oriental Line). This company was owned by the United States Government. All its ships were named after U. S. presidents. The Company owned five vessels that delivered silk from the Orient to Seattle. Initially they crossed the Pacific in 19 days, but gradually cut the time to an average of nine days, 20 hours, and seven minutes in 1924 (8,300 miles). The fastest trip was by the *President Jackson* - nine days 50 minutes (Hubbard, loc. cit.).

The Company's ships stopped briefly at Victoria BC where operating and traffic personnel of the Union Pacific Railroad boarded the ship. During the 97 mile voyage to Seattle they prepared the Customs clearing documents (Hubbard, loc. cit.).

Information was also phoned from Victoria to the Union Pacific freight agent at Seattle. He was advised as to the number of bales, their consignees, and their destination. He then prepared the necessary waybills. All this effort was undertaken to try and ensure the prompt dispatch of the waiting eastbound silk train (Hubbard, loc. cit.).

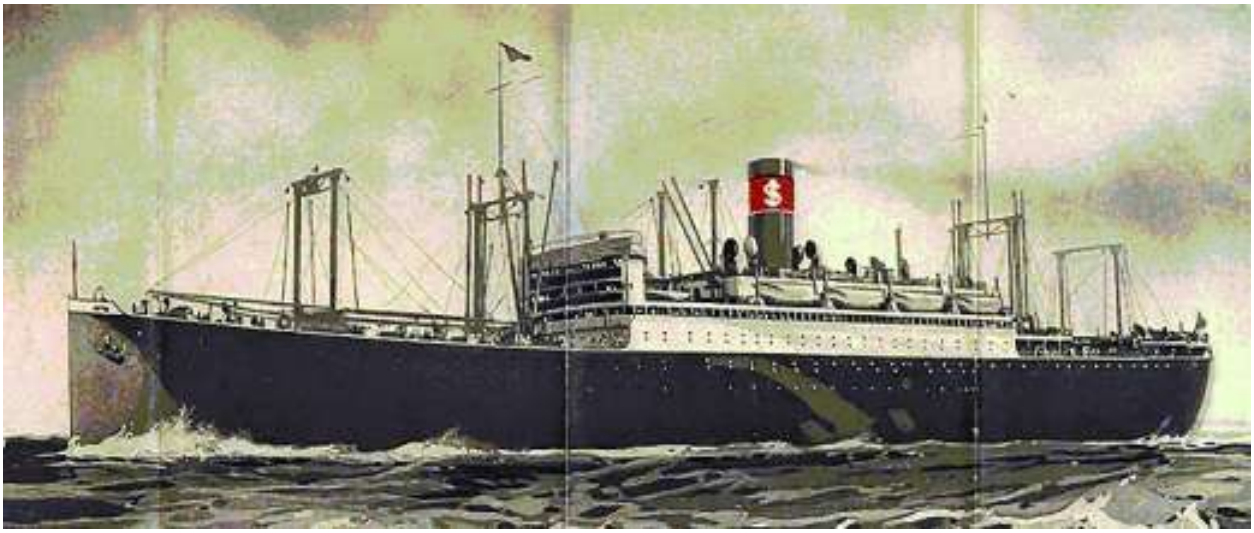
In 1922, ships of the Line brought silk cargoes into Seattle/Tacoma worth in excess of $180 million (Tate, loc. cit., p. 248)

In January 1923, a $10 million shipment of raw silk reached New York City, 13 days, four hours and 55 minutes, from Yokohama. The voyage from Yokohama to Seattle was on an Admiral Oriental Line vessel. The subsequent rail shipment involved three trains of 10 cars each (*New Speed Record in Raw Silk Delivery*, Bridgeport CT Telegram, February 3, 1923).

On May 10, 1923, the *President Grant* arrived in Seattle after traveling from Yokohama, in nine days, 20 hours and seven minutes. Her sister ship, the *President Jackson* made the same trip, arriving in Seattle on September 7, with a cargo of raw silk valued at over $16 million (Iseminger, loc. cit.).

From 1924 to the end of 1926 the five "*Presidents*" landed more than $500 million worth of raw silk in Seattle. In the best month in this period, almost 230,000 bales (almost 15,000 short tons) of silk arrived, with a value of almost $21 million. As well, 611 cases of silk goods worth almost $540,000, were landed. The total value of silk which arrived in Seattle that month was $22.5 million, carried in seven vessels. (Hubbard, loc. cit.).

In one trip in 1925, the *President Grant* landed 10,000 bales of silk and 60 tons of other silk goods, worth $10 million, in Seattle/Tacoma. Three trains, of 10 cars each, carried the silk to the New York City area, in three days, nine hours and 25 minutes (Tate, loc. cit., p.248).



Collection of Bjőrn Larrson, Maritime Images

The Pacific Steamship Company operated five President liners from 1921. The Company was renamed Admiral Orient Line in 1922 and in 1926 was bought by the Dollar Steamship Company. They were all of the American Shipping Board 535 class. They measured 535' x 72'6" x 32'3" and were of 14,124 gross tons. They were two shaft, turbine driven vessels with a top speed of 17.5 knots (information from Wikipedia, on Google).

BLUE FUNNEL LINE. The Blue Funnel Line was the name given to the ships of the Alfred Holt Company of Great Britain. The Company was founded in 1866. It operated freighters world wide, which had the reputation of being sturdy and reliable – but they were not fast.

In 1902 the Great Northern, and Northern Pacific railroads jointly made a contractual arrangement with Blue Funnel Line (Kemble, loc. cit.).

When the Canadian National Railway became involved in the silk trade in 1925, it formed an agreement with the Blue Funnel Line. Between July 1, 1925 and July 1 1926 this company's ships docked 15 times at Vancouver bringing over 41,200 bales of raw silk to the Canadian National.. The smallest cargo, on the *Talthybius*, was 1,359 bales, and the largest, on the *Tyndareus*, was 5,256 bales (Webber, loc. cit., p. 112).

On September 8, 1927 the Blue Funnel Line SS *Protesilaus* docked at the Ballantyne Pier in Vancouver. She was carrying 7,400 bales of raw silk, valued at $7.4 million (i.e. $1,000 per bale).The silk traveled east in two 11 car Canadian National trains (*Largest Load of Silk Ever Sent in One Vessel From Japan*, Manitoba Free Press. Friday September 9, 1927).

On December 2, 1927 the S.S. *Protesilaus*, arrived in Vancouver, 36 hours late due to heavy storms in the North Pacific. She carried $2.5 million worth of raw silk, destined for New York City (Vancouver Province, December 3, 1927).

On February 4, 1931, the Blue Funnel Company's SS *Ixion*, landed 2,000 bales of raw silk valued at $1.7 million. It was transported east by an eight car CNR train. And, on the 24th, the SS *Tyndareus* also landed 2,000 bales (value $2 million). The ship docked at 09:00 and the Canadian National train departed the Vancouver Wharf for the New York City area at 12:00 (Vancouver Province, Marine Notes, February 4 and February 24, 1931).

The Blue Line freighter *Tyndareus* was expected in Seattle on August 8, 1932, having been diverted from Vancouver. She was carrying 1,700 bales of raw silk valued at $350,000 ($206 per bale). The silk was to be conveyed eastward over the Chicago, Milwaukee St. Paul, and Pacific Railroad. The Blue Line *Proetsilaus* was also being diverted from Vancouver to Seattle and was due in on August 16, 1932 (*More Silk Will Come from Japan*, Oakland Tribune July 28, 1932, with a Seattle dateline).

CALIFORNIA AND ORIENTAL STEAMSHIP COMPANY. The shipping company was set up by the Atchison, Topeka and Santa Fe Railroad (AT&SF) in 1898 to connect with the Orient and San Diego CA. This railroad was the only one serving San Diego, but it is not known if any silk was landed there. The agreement lasted until 1902 when the railroad gained access to San Francisco. It then interchanged freight with the Pacific Mail. The shipping company sent 25% of its Oriental originating freight eastwards over the AT&SF (Kemble, loc. cit.).

CANADIAN PACIFIC STEAMSHIPS. The Company was founded in 1884, and operated its first ships on the Great Lakes to assist in construction of the Canadian Pacific Railway. Trans-Pacific service was initiated in 1887 from Vancouver. In 1903 the Company commenced its trans-Atlantic steamship service. Incidentally, the Canadian Pacific Railway was the only North American railroad, to operate steamship services across both the Atlantic and Pacific Oceans (Turner, loc. cit.; Wikipedia).

Canadian Pacific Steamships had several advantages compared to other trans-Pacific steamship companies in the silk conveying business, as follows:

- it was the only steamship company that had a steady relationship with the same railroad throughout the silk train era;
- the port of Vancouver was closer to the Orient than other west-coast ports (although only marginally so compared to Seattle/Tacoma;
- the Canadian Pacific company's steamships were often the fastest vessels in the trans-Pacific silk carrying business;

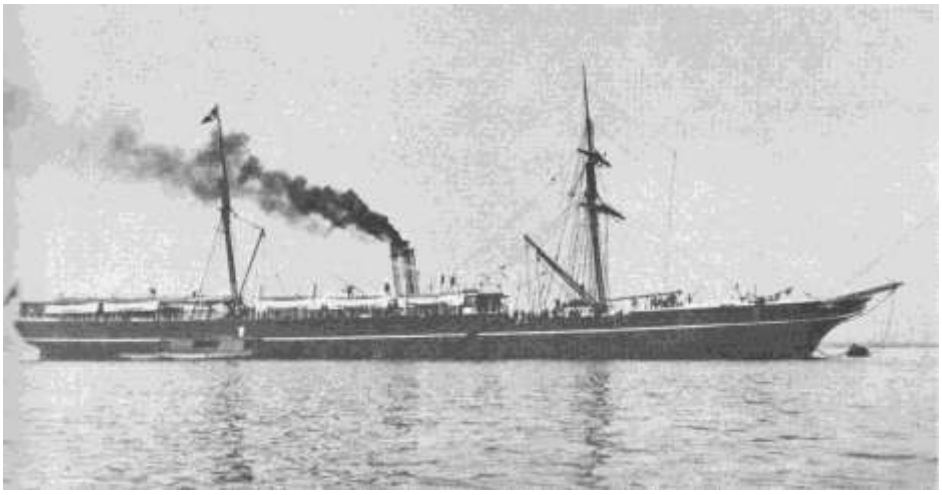
- unlike US registered vessels, Canadian Pacific Steamships could use Chinese labour;
- Canadian Pacific Steamships had contracts to deliver (British) Royal Mail and Canadian mail across the Pacific Ocean to and from China and Japan;
- Canadian Pacific Steamships had a high marine insurance classification and hence were able to offer shipper's very competitive tariffs; and,
- in return for using Japanese coal as fuel in their Empress liners, at a time when many ships had converted to oil fuel, the Japanese Government gave Canadian Pacific favourable treatment in assigning raw silk cargoes (D. Jones, *Steamship's Role Underplayed in Silk Trade*, CP Rail News, April 1987; Lamont, loc. cit.; Kemble, loc. cit.).

None of these advantages taken singly, were significant, but taken together they gave the Canadian Pacific Steamships a noticeable advantage over other shipping companies.

All raw silk carried by Canadian Pacific Steamships was carried eastwards by the Canadian Pacific Railway. Although silk was one of the first commodities to be landed at Vancouver, it was several years before one ship carried sufficient raw silk to warrant a silk train. Nevertheless these early landings are recorded here to provide a more complete story. It was not specified whether the packages contained raw or manufactured silk.

The fist shipment of raw silk to arrive in Vancouver was on the Canadian Pacific liner *Abyssinia.* She docked in Vancouver on June 14, 1887, carrying 2,830 tons of cargo. Of this, there were 63 packages of raw silk destined for New York City and two for Montreal. Included in the shipment was tea, of which a special parcel was given priority and reached New York, 21 days after it left Yokohama. Much of the rest of the cargo reached New York 29 days after leaving Yokohama. The *Abyssinia* made 17 trans-Pacific voyages for Canadian Pacific Steamships (Turner, loc. cit.).

The second shipment containing silk was on the CP liner *Parthia*. She arrived on July 4, 1887, 13 days and 10 hours out of Yokohama. She carried 21 packages of silk. The carload of silk left Vancouver by train on July 5. (Turner, loc. cit.). The *Parthia* made a total of 20 trips across the Pacific while in CPR service (Haws, loc. cit.).



Vancouver Maritime Museum

> *Parthia* was built by Wm. Denny & Co. at Dumbarton and completed in 1870. She was of 3,167 tons gross, 360'6" long, 40'4" beam, 12 knots. She entered Canadian Pacific Steamships service in 1887, and left in 1891. She too carried a full set of sails. (D, Haws, *Merchant Fleets in Profile*, vol. 3, Stephens, Cambridge, 1979. ISBN 0850593522).

The Canadian Pacific liner *Batavia* arrived in Vancouver on December 27, 1887 - 16 days and 22 hours out of Yokohama, after encountering lots of bad weather. She carried, amongst other cargo, 165 packages of silk. This constituted the ninth and final voyage for 1887 for Canadian Pacific ships. The *Batavia* made 15 voyages for the company. (Turner, loc. cit.).

By 1888, over 560,000 pounds of raw silk had been delivered to the Canadian Pacific Railway by the company's ships (Turner, loc. cit.).

CANADIAN PACIFIC *EMPRESS* STEAMSHIPS TRANS-PACIFIC SAILING RECORDS

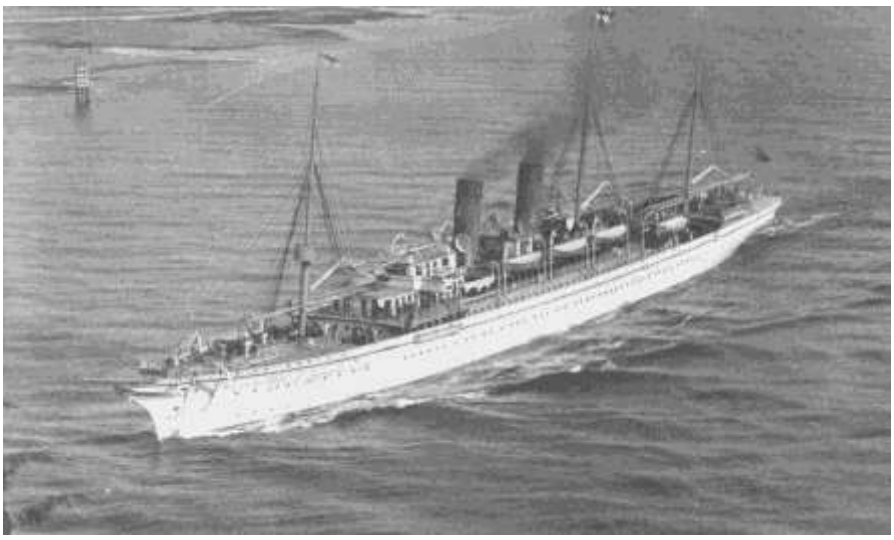
Eastbound between Yokohama Japan, and Race Rocks BC Canada, ~ 4,280 miles or 6,887 km.

NAME *Empress of*	DATE	DURATION OF CROSSING	SPEED IN KNOTS
India	April 28, 1891	11 d, 7 h, 27 m	15
Japan I	June 22, 1891	10 d, 21 h, 23 m	~ 16
Japan I	August 29, 1891	10 d, 13 h, 10 m	~ 17
Russia	June 7, 1913	9 d, 5 h, 20 m	~ 19
Asia	May 3, 1914	9 d, 2 h, 44 m	19
Russia	May 29, 1914	8 d, 13 h, 31 m	~ 20
Canada	June 17, 1923	8 d 10 h, 53 m	~ 21
Japan II	August 22, 1930	8 d, 6 h, 27 m	21
Japan II	February 20, 1931	8 d, 3 h, 18 m	21
Japan II	April 17, 1931	7 d, 20 h, 16 m	22

Turner, loc. cit.

Note: More often than not, the Empress ships carried raw silk and silk goods.

By the end of the 1880s the *Batavia, Abyssinia and Parthia* were deemed to be too slow. They were replaced by three *Empresses* in 1891-1892, the *Empress of India*, *Empress of Japan* and *Empress of China*. The first of these, the *Empress of India* arrived in Vancouver on April 28, 1891, 11 days out of Yokohama. She inaugurated the fastest steamship service across the North Pacific at that time. Her 1,800 tons of cargo, included tea, silk, sugar, opium and rice (Turner, loc. cit). These ships carried silk on most of their voyages.



Vancouver Maritime Museum

The *Empress of Japan* steaming through the First Narrows of Vancouver Harbour outbound for Japan.

E*mpress of India* (1890-1914), *Empress of Japan* (1891-1922), *Empress of China* (1891-1911). 5,905 gross tons, 455'7" long, 51'2" beam, 16 knots. 600 passengers. They were relatively fast for contemporary Pacific Ocean service. With their clipper bows they had a yacht-like experience. The *India* was sold in 1914, and the *Japan* in 1922 while the *China* was wrecked in 1911 (Haws, loc. cit.).

Seven cars of raw silk and early crop tea arrived in Vancouver on July 30, 1889. The elapsed time from embarkation in Yokohama to arrival in New York was 21 days – the fastest on record. (BC Magazine July 30, 1964 as recorded in Chambers fonds).

On September 3, 1892 the *Empress of China* landed so much silk that the usual current method of moving silk two cars at a time on a passenger train would take over one week. Consequently, it was proposed that a unit train of silk be run instead (CPR Archives as quoted in Webber, loc. cit., pp. 14-15).

On December 14, 1898 the *Empress of India* arrived in Vancouver carrying 232 tons of raw silk and silk goods. She had left Yokohama on December 2. In a letter dated December 5 the Company's Freight Traffic Manager, requested of the Assistant to the Vice-President, that all this silk be put on one train. At 35 tons per car this would have required six or seven cars (CPR Archives via Webber, loc. cit., p. 13). This shipment may have resulted in the Canadian Pacific Railway's first silk train.

On one voyage in the early 1890's the *Empress of Japan's* cargo of silk was insured by the consignee at a cost of $80.00 per 24 hours. (CPR Archives via Webber, loc. cit., p. 8).

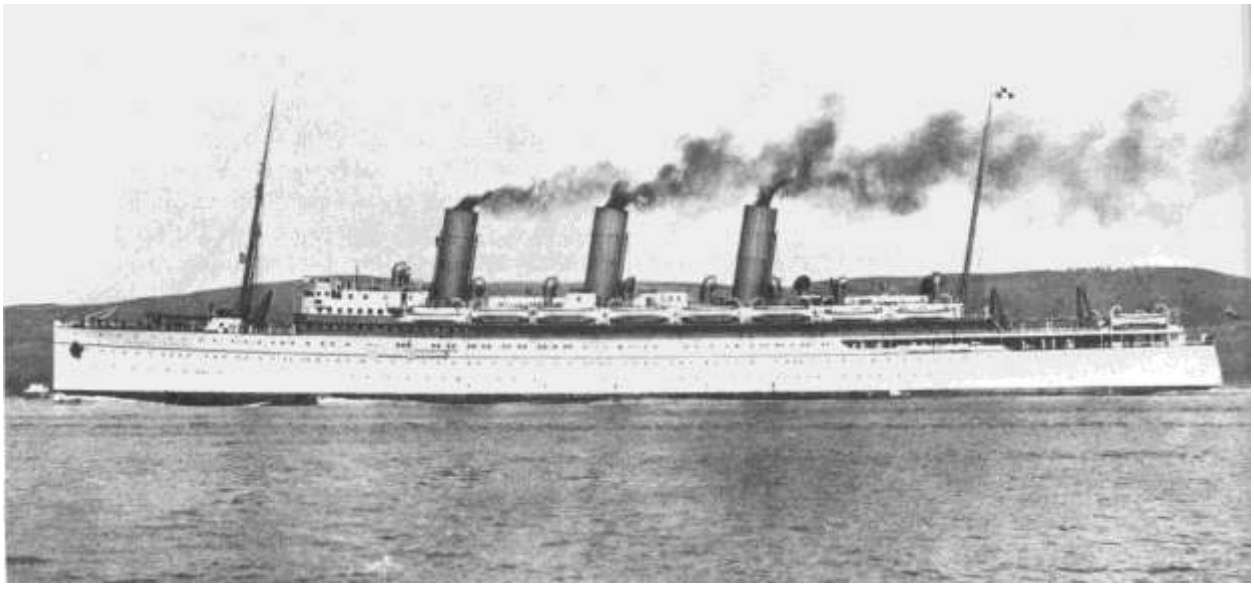
The *Empress of India* left Yokohama on December 5, 1898, carrying 232 tons (between six and seven carloads or about 35 tons per car) of raw silk and silk goods. The steamer was expected to arrive in Vancouver on December 14 (CPR Archives via Webber, loc. cit., p. 13).

The Vancouver Province reported that the *Empress of Japan* had arrived on August 6, 1901 carrying raw silk valued at $1 million. At about the same time the company's *Tarter* arrived, carrying 539 tons of raw silk (worth $1 million) and $500,000 worth of silk goods. The newspaper pointed out that the value of these two shipments had never before been exceeded and that this demonstrated that the route to New York City from the Orient via Vancouver was very popular with both oriental shippers and American manufacturers (Lamont, loc. cit.).

In January 1913 the Canadian Pacific steamship *Monteagle*, landed 4,911 bales of raw silk, valued at $1.26 million, in Vancouver. The silk was dispatched in a train of baggage cars for New York City (Turner, loc. cit.).

By 1911, the original Empresses were 20 years old. Consequently, Canadian Pacific Steamships embarked on a new construction program, building the *Empress of Russia* and the *Empress of Asia*. The *Asia* arrived in Vancouver on September 7, 1913. Her cargo of silk was delivered in New York City on September 5, just 17 days out of Yokohama (Webber, loc. cit., p. 22).

On June 7, 1913, the *Empress of Russia* completed her maiden trans-Pacific voyage in nine days five hours between Yokohama and Williams Head (near Victoria). The average speed was 19.5 knots. Included in her cargo were 1,523 bales of raw silk.



Vancouver Public Library

Empress of Russia (1913-1914, 1919-ca 1935), *Empress of Asia* (1913-1914, 1919-ca 1935). 16,810 gross tons, 570'2" long, 68'2" beam, 19 knots, 1,180 passengers (Haws,

loc. cit.). These vessels set a new standard for comfort and speed in trans-Pacific service.

On May 3, 1914 the *Empress of Asia* crossed the Pacific Ocean in nine days, two hours, averaging 19.2 knots. Later in May, the *Empress of Russia* crossed in eight days 18 hours, setting a record which was to stand for nine years (Turner, loc. cit.).

In August 1916 the *Russia* landed almost 5,000 bales of silk valued at $3.5 million. This was a new record (Turner, loc. cit.).

The *Empress of Japan* arrived in Vancouver on February 1, 1917 with a cargo of silk valued at $2 million (Canadian Pacific Railway Passenger Department Bulletin quoted in Jameson fonds, loc. cit.).

On August 25, 1919 the *Empress of Asia* arrived in Vancouver carrying 10,000 bales of raw silk and 2,053 cases of silk goods. The total silk cargo was valued at $10 million. (CP Bulletin October 1919, p. 15 as recorded in Webber loc. cit., p. 17; Chamber's loc. cit.: Jameson, loc. cit.)).

The *Empress of Russia* left Yokohama on April 29, 1922 and arrived in Vancouver on May 12. She carried 3,000 bales of silk destined for New York City. The *SS Bay State* left Yokohama the same day, but her consignment of silk did not reach New York until May 15 (CPR Passenger Department Bulletin, quoted in Jameson fonds, loc. cit.).

The *Empress of Asia* sailed from Yokohama on March 22, 1924 for Vancouver. The railway cars in Vancouver, were loaded in an average of 13.5 minutes each. The train reached New York City just before 24:00 on April 4 – 13 days, eight hours and 13 minutes after leaving Yokohama (CPR Passenger Bulletin, May 1924, quoted in Jameson fonds, loc. cit.).

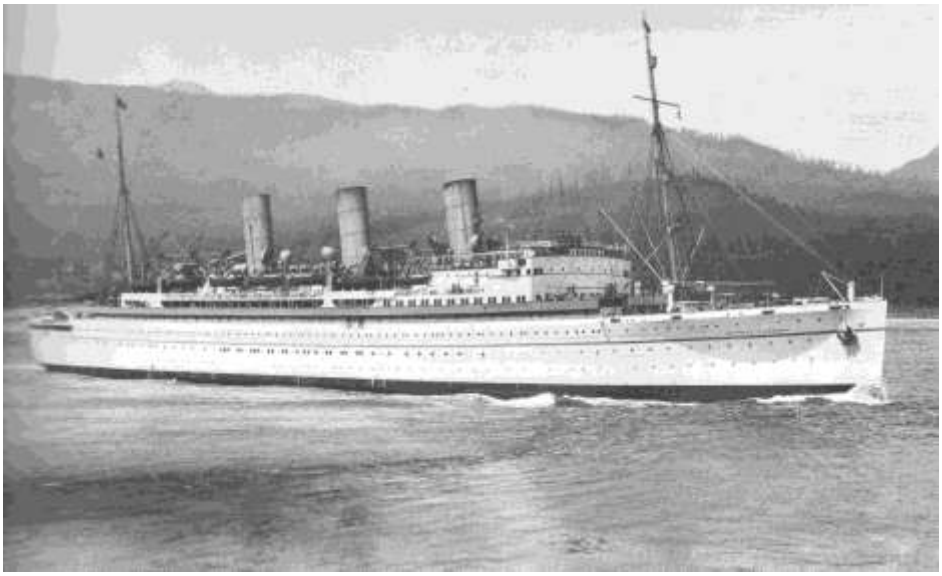
In August 1926 the *Russia* landed 21 car loads of raw silk valued at $9 million – the biggest and most valuable silk cargo, for the current year to date (Turner, loc. cit.).

On September 21, 1926, a silk train made up of 24 cars reached Fort William ON, from Vancouver, at an average speed of 37.9 mph for the 1,393.5 mile journey. The fastest time for this journey, averaged 41 mph with a 15 car train. The silk had been landed from the *Empress of Asia* (CPR Passenger Train Bulletin November 1926, as quoted in Jameson fonds).

In September 1927, the *Russia* landed 21 cars of raw silk valued at $7 million. It was all destined for New York City (Turner, loc. cit.).

The *Empress of Asia* was expected on December 4, 1927 with a cargo of $3 million worth of silk. A later report valued the silk at $5 million (Vancouver Province, December 2, 5 and 7, 1927). The Empress of Canada was due to arrive in Vancouver on Christmas Day carrying 760 tons of silk valued at $5.1 million. It was to be taken east on a 16 car train (Vancouver Province, December 23, 1927).

The *Asia* and *Russia* landed the majority of silk carried by Canadian Pacific Steamships during the 1920's and up to about 1935 (Turner, loc. cit.).



Frank Leonard

Empress of Canada (1922 – ca.1935). 21,517 gross tons, 627' long, 77'8" beam, 18 knots, 1,758 passengers (Haws, loc. cit.).

On October 13, 1929 the *Empress of Canada* ran aground on Albert Head in a fog eight miles off the entrance to Victoria Harbour. She was unable to extricate herself; consequently the passengers and cargo were removed. The cargo included raw silk which was offloaded into lighters. She was eventually refloated and repaired. (BC Magazine June 23, 1956, quoted in Chamber's loc. cit.).

The second *Empress of Japan* (1929 – ca 1935), looked very similar to the *Empress of Canada* but was larger (26,032 gross tons) and faster (22 knots) (Haws, loc. cit.).

In March 1932 the *Empress of Russia* and the *Hikawa Maru*, arrived in Vancouver, together carrying 3,500 bales of silk valued at over $2.5 million. It was consigned to mills in the New York area and Montreal (B.C. Magazine, March 21, 1932, quoted in Chambers fonds, loc. cit.).

The *Empress of Canada* brought in $2 million worth of silk on August 2, 1933, along with 10 million ounces of silver worth $2.5 million (BC Magazine, August 2, 1933, quoted in Chambers fonds, loc. cit.).

The biggest cargo of silk to arrive in Vancouver in several years was unloaded from the *Empress of Asia* in August 11, 1935. It filled 13 cars and was worth $2 million (BC Magazine, Aug 11, 1960, quoted in Chambers fonds, loc. cit.).

In the early 1930's, Alberta Pioneer Railway Association member Ron Bailey, remembers watching CPR Empress liners unloading their silk cargos. The Marine News section of the Vancouver Province announced the arrival of silk-carrying vessels. When the unloading was complete, onlookers were invited aboard to inspect the ship, which Bailey remembers doing.

DOLLAR STEAMSHIP COMPANY. The Company was prominent in trans-Pacific trade from the early 1920's to 1938. Many of its ships were named after U.S. Presidents and it became known as the President Line. A number of their ships carried silk, but few details were found. One exception was the President Grant, which landed $10 million worth of cargo on the West coast. This included 10,000 bales of raw silk and 60 tons of manufactured silk. It took three trains of 10 cars each to move the silk to the New York area, which they reached in three days, nine hours and 25 minutes (Tate, loc. cit. p. 246).

GREAT NORTHERN STEAMSHIP COMPANY. The *Minnesota* and *Dakota* were completed for the Great Northern Steamship Company in 1905. The Company was a subsidiary of the Great Northern Railway Company. They joined the Nippon Yushen Kaisha ships in providing an expanded service across the Pacific Ocean, but made only four voyages per year (Turner).

> *Minnesota* and *Dakota* were built by the Eastern Shipbuilding Company of Groton CT and completed late in 1904. Their gross tonnage was 20,718, length 622 feet, beam 73.5 feet, and speed 12 knots. The Dakota was wrecked in 1907 and the Minnesota was laid up in 1914. At the time they were the biggest vessels in the trans-Pacific trade but were by no means the fastest, and were not considered to be very successful. (Turner, loc. cit.).

MAERSK LINE. The freighter *Peter Maersk* dropped off a small consignment of silk on December 21, 1932 in Oakland (Oakland Tribune December 21, 1932).

MITSUI BUSSAN KAISHA. The *Taihei Maru* arrived in Seattle on July 3, 1929 with 2,000 bales of silk, while the *Hakabasan Maru* was expected on July 24 (*Two Silk Cargo Ships are Due,* Oakland (CA) Tribune, July 2, 1929).

The *Taihei Maru* was the fifth ship from Japan to discharge silk in Oakland in December 1932 (Oakland Tribune, December 21, 1932).

NIPPON YUSEN KAISHA. (This name translates as Japan Mail Line). This line was founded in 1885, and carried silk between the Orient and Vancouver. In 1896 the Great Northern Railroad entered into an agreement with the line to provide a service between Hong Kong, Japan and Seattle/Tacoma involving a mutual exchange of traffic This agreement was renewed in 1917 and 1921 (Iseminger, loc. cit.; Turner, loc. cit.; Kemble, loc. cit.).

Service was opened with three ca. 3,000 ton ships in 1896 (*Miike Maru, Yamaguchi Maru, Kinshu Maru*). In 1900-1901 the three original ships were replaced by three 6,300 ton ships (*Kaga Maru, Shinano Maru, Iyo Maru*). The agreement was in force at least until 1914 (Kemble, loc. cit.).

From 1911 the Atchison, Topeka and Santa Fe Railroad shared one-third of the east bound freight from the Nippon Yusen Kaisha (Kemble), loc. cit.).

In May 1925, 4,727 bales of raw silk were landed on the west coast from the Nippon Yusen Kaisha steamship *Siberia Maru*. The value was $4.75 million (New York Times, May 28, 1925).

On July 13, 1927 the *Iyo Maru* of the same line was expected in Seattle, carrying 2,700 bales of raw silk and 36 cases of silk goods (see under Osaka Shosen Kaisha for reference).

The Nippon Yusen Kaisha liner *Heian Maru* (sister to the *Hikawa Maru*) made a record trans-Pacific crossing for one of the company's ships early in 1931. Her speed averaged 17.5 knots between Yokohama and Race Rocks, with a trip of 10 days, four hours and 57 minutes. She landed a cargo of manufactured and raw silk at the Terminal Dock in Seattle (Vancouver Province, Marine News, January 7 and 12).

The same company's liner *Tatsuta Maru* carrying a cargo of gold and raw silk was due in San Francisco on January 22, 1931. The silk was valued at $4.25 million. Incidentally, during 1930 Japan shipped $100 million of gold to the United States to balance her trading account.

In May 1925, 4,727 bales of raw silk were landed on the west coast from the Nippon Yusen Kaisha steamship *Siberia Maru*. The value was $4.75 million (New York Times, May 28, 1925),

On July 13, 1927 the *Iyo Maru* of the Nippon Yusen Kaisha line was expected in Seattle, carrying 2,700 bales of raw silk and 36 cases of silk goods (*Silk Shipment Worth Over $10 Million Due*, Oakland (CA) Tribune, July 9, 1927, p.9, quoting a Seattle dateline of July 9).

NORTHERN PACIFIC STEAMSHIP COMPANY. After Canadian Pacific Steamships sold the *Batavia* and *Parthia* in 1892 the two ships began to deliver silk to the Northern Pacific Railroad at Tacoma, under their new owners, the Northern Pacific Steamship Company. Somewhat later the *Batavia* was renamed *Tacoma,* and the *Parthia* became the *Victoria.* In 1901 the Northern Pacific Railroad bought the steamship company – which was dissolved in 1908. In 1904 they were assigned to routes other than the trans-Pacific one. In 1902 the *Shawmut* and *Tremont* were added to the Northern Pacific Railroad trans-Pacific steamship service. They were retired in 1907 (Turner, loc. cit.; Kemble, loc.cit).

OCCIDENTAL AND ORIENTAL STEAMSHIP COMPANY. The Company was incorporated in 1874 by the Central Pacific Railroad (later absorbed by the Southern Pacific Railroad). They began operations by chartering three ships from the British White Star Line. Eventually the Southern Pacific and Union Pacific Railroads became joint owners, and the steamship company was later merged with the Pacific Mail Steamship Company. Ultimately nine ships were operated which sailed out of San Francisco.

In 1889 the *Doric* landed 2,346 bales of raw silk, valued at $2.5 million – the largest shipment of silk up to that time. The company was absorbed into the Pacific Mail Steamship Company around 1900. (Hubbard, loc. cit.; Tate, loc. cit.)

OSAKA SHOSEN KAISHA. The Company transported silk exclusively for the Chicago, Milwaukee, St. Paul and Pacific Railroad and utilized the Port of Seattle. The steamship company operated six vessels on the route sailing semi-monthly (*Handling Silk*, loc. cit.; Kemble, loc. cit.).

In late 1924 the Osaka Shoshen Kaisha *Arabia Maru* carried the largest consignment of silk to arrive in Seattle. It consisted of 10,124 bales of raw silk and 60 tons of manufactured silk. (Iseminger, loc. cit., p. 24).

The Company's steamship *Paris Maru*, was expected to arrive in Seattle on July 10, 1927 carrying 3,800 bales of raw silk and 50 tons of silk goods. On July 18 the *Africa Maru* was due, carrying 2,400 bales of raw silk and 50 tons of silk goods. Three special trains moved these goods to the New York City area (including silk from the Nippon Yusen Kaisha steamship *Iyo Maru*, (expected on July 13) (*Silk Shipment Worth Over $10 Million Due*, Oakland (CA) Tribune, July 9, 1927, p.9, quoting a Seattle dateline of July 9).

The Osaka Shosen Kaisha freighter *Kwanto* Maru discharged 400 bales of raw silk in Oakland on December 21, 1932 before proceeding to New York City to unload 3,000 bales there (Oakland Tribune, December 21, 1932).

More than 22,000 bales of raw silk were landed at Oakland in 1932, worth $4.4 million (i.e., $200 per bale). In 1931, no silk had been landed at Oakland (Oakland Tribune, December 30, 1932).

In early 1933 the Osaka Shosen Kaisha announced it would increase its Kobe-Los Angeles-New York City run to eight ships, operating on a 14 day frequency, This was an increase from six ships on a 21 day frequency. The two new ships were the *Nankei Maru* and the *Hokkei Maru*, and took 12 days to reach Los Angeles form Yokohama (*OSK Increases Fleet*. Oakland Tribune, CA, January 31, 1933).

PACIFIC MAIL STEAMSHIP COMPANY. The Company was formed in 1848, by U.S. interests, and subsequently operated wooden side-wheel steamships. By the time the US transcontinental railway was completed it had a very close relationship with the railway across the Isthmus of Panama. The Panama route was more profitable than the overland route by rail. Its major disadvantage was that it was slower – 35 days from the Orient to New York, versus 26 days overland. But this difference was important for silk transport, and some other goods (such as tea) and for passengers (Kemble, loc. cit.).

In 1871 the Central Pacific, and Union Pacific Railroads entered into a contract with the Pacific Mail Steamship Company, to guarantee most of the freight capacity on each of the company's steamships. Two years later the company began replacing its wooden side-wheelers with iron propeller ships. Other railroads adopted the contractual practice with Pacific Mail, which lasted until 1892. However, the relationship between the railroads and the shipping company was tempestuous, and in 1874 the railways chartered the Occidental and Oriental Steamship Company. In the meantime the Central Pacific had been absorbed into the Southern Pacific which took control of Pacific Mail by 1880. (Note that the Southern Pacific and Union Pacific

were closely connected). Pacific Mail and Occidental and Oriental operated harmoniously together. Pacific Mail eventually absorbed Occidental and Oriental (Kemble, loc. cit.; Southern Pacific Railway Bulletin Bulletin, October 1, 1914, p.8 as quoted in DL Hofsommer, "Southern

City of Peking, Wikipedia

The *City of Peking* was built by John Roach & Sons of Philadelphia in 1874 for the Pacific Mail Steamship Company. She was an iron-hulled fully rigged sailing ship with a 5,000 hp steam engine giving a speed of 14.5 knots. She was of 5,079 gross tons, 423 feet long, beam 47'4" and draught 38'6". The U.S. Government provided a $1 million annual subsidy for her operation. She carried the first raw silk consigned by a Japanese broker in Yokohama to a Japanese silk broker in New York City, which was landed in San Francisco on September 21, 1876 (see Wikipedia; H.M. Reischauer, loc. cit.). Previous silk shipments to the USA involved one or more western brokers. The crossing took over 20 days. The silk was delivered to Hoboken from San Francisco in 80 hours by train.

Pacific 1901-1985," Texas A&M University Press, College Station 1986, p.152. ISBN 0890962464).

In 1887, it was estimated that shipping charges for silk across the Pacific Ocean could reach $2 million. Over 85% of this was handled jointly by the Pacific Mail and the Occidental and Oriental steamship companies (Turner, loc. cit.).

In 1890, the Northern Pacific Railroad attempted to negotiate a contractual arrangement with Pacific Mail. But the steamship company withdrew from the negotiations (Kemble, loc. cit.).

In February 1901 the Pacific Mail liner *Rio de Janeiro*, piled up on the rocks while entering the Golden Gate, at the entrance to San Francisco's harbour. Seven hundred and eighty six bales of raw silk were lost, along with 658 cases of silk goods (San Francisco Call, February 26, 1901).

The Atchison Topeka and Santa Fe Railroad reached San Francisco in 1902 and made an agreement with the Pacific Mail Steamship Company to handle 25% of the shipping company's freight business, both east and west bound.

The Pacific Mail acquired the *Korea* in 1902 (11,300 tons), the *Siberia* in 1903 (11,300 tons) and the *Manchuria* (13,600 tons) and *Mongolia* in 1904 (13,600 tons). (Tate, loc. cit.; Kemble, loc. cit.).

The Company's *Mongolia* arrived in San Francisco on November 22, 1908, carrying 3,070 bales of raw silk and the Chinese Viceroy and his wife. The ship was intentionally delayed for 12 hours at sea so that the Chinese party could be appropriately welcomed ashore during daylight. Unfortunately, the firm to which the silk was consigned had to pay their share of the costs of the delay (San Francisco Call, November 23, 1909, p. 9).

On September 17, 1914 the Pacific Mail Steamship Company liner *Manchuria* landed the largest cargo of merchandise that had ever reached San Francisco from the Orient. The silk and silk pieces were sped eastwards by special train (Hofsommer, loc. cit.).

The Southern Pacific withdrew its involvement in the Pacific Mail Steamship Company in 1915 when it was taken over by the Grace Line (Kemble, loc. cit.).

TOYO KISEN KAISHA. The Company began using the Port of San Francisco in 1898, breaking the Pacific Mail's monopoly on that Port's Oriental business. However, the competition seems to have been very friendly. Toyo Kisen Kaisha and Pacific Mail sailings were carefully coordinated. The service started with the *America Maru*, *Hongkong Maru* and *Nippon Maru*. In 1908 the *Chiyo Maru* and *Tenyo Maru* were added and in 1911, the *Shinyo Maru* (Kemble, loc. cit.).

Also in 1911 the Western Pacific Railroad made an agreement with the Toyo Kisen Kaisha line to carry a portion of the steamship company's eastbound traffic. The same year, the Southern Pacific Railroad made a similar agreement. The Atchison, Topeka and Santa Fe Railroad also shared in this traffic (Kemble, loc. cit.).

THE PORTS

In 1893, 18,763 bales of raw silk valued at $9.5 million (over $500 per bale), were imported into the USA from Japan. Japanese merchants sold the silk to US manufacturers (*Japanese in New York*, Reno (NV) Evening Gazette November 13, 1894, p.2)

Throughout 1901, eight ships carrying silk, arrived in Vancouver. The silk filled 176 rail cars (Lamont, loc. cit.).

Manifests reached New York City on March 2, 1904 from the following west coast arrivals – 1,700 bales of raw silk on the *Athenian* at Vancouver, 112 bales of raw silk on the *Lyra* at Tacoma, and 820 bales on the *Doric* at San Francisco (New York Times, March 3, 1904, p.11).

In August 1908, 2,600 bales of raw silk, worth $2 million were landed from the SS *Asia* at San Francisco. The entire shipment was consigned to New York City (New York Times, August 30, 1908).

During 1925, 261,853 bales of raw silk were landed at Seattle, and transported to the New York City area. The value was approximately $700 million, i.e., about $270 per bale. At 500 bales per car, this silk would have required over 500 cars or 33 15 car trains – or about three silk trains per month (Helena (MT) Daily Independent November 28, 1926).

The largest shipment of silk up to 1927 was landed at Vancouver on September 8, 1927. The vessel involved was the Blue Funnel ship *S.S. Protesilnus* which carried ~7,400 bales of raw silk valued at $7.4 million. The silk was loaded into two 11 car Canadian National trains (*Largest Load of Raw Silk Ever Sent in One Vessel From Japan to Vancouver*, Winnipeg Free Press, September 9, 1927).

The Blue Funnel line's SS *Achilles* landed almost 4,000 bales of raw silk in Vancouver on September 24, 1927. And on the 26th, 5,000 bales were landed from the *London Maru.* Both shipments moved east over the Canadian National Railway (Kamloops Sentinel, September 30, 1927).

In 1929, the situation with respect to West Coast ports which handled raw silk was (*Handling Silk, loc. cit.)*:

> Seattle/Tacoma: 232,000 bales. Railway Companies: Chicago, Milwaukee, St, Paul and Pacific, Great Northern, and Union Pacific (actually its subsidiary Oregon Steam & Navigation Company). Steamship Companies: American Mail (otherwise known as Admiral Oriental Line), Kawasaki Kisen Kaisha, Kabushiki Kaisha, Mitsubishi Kaisha, Mitsui Bussan Kaisha, Nippon Yusen Kaisha, Osaka Shosen Kaisha.
>
> San Francisco: 144,000 bales. Railway Companies: Atchison, Topeka and Santa Fe, Southern Pacific, and Western Pacific. Steamship Companies: Dollar Lines, Kawasaki Kaisha, Mitsui Bussan Kaisha, and Nippon Yusen Kaisha.

Vancouver: 134,000 bales. Railway Companies: Canadian National, and Canadian Pacific. Steamship Companies: Blue Funnel Line, Canadian Pacific Steamships, Osaka Shoshen Kaisha, Mitsui Bussan Kaisha.

Portland: 10,000 bales. Railway Companies: Southern Pacific, and Union Pacific (Oregon Steam and Navigation Company).

Regardless of the port at which the silk was landed, practically all of it ended up in the New York area with small amounts going to Chicago, Indianapolis and Montreal.

In January 1930 it was anticipated that 21 vessels would land Japanese raw silk at west coast ports. Each consignment would carry at least 2,000 bales, with each bale valued at $1,200. The largest volume of Japanese raw silk was landed in 1928. Brooklyn Daily Eagle, January 13, 1930 *No Silk Stocking Slump Reported From Japan*. www.fultonhistory.com.Fulton.htm.

In February 1931, 22 ships carrying raw silk were expected to land cargos at west coast ports according to the Traffic Bureau of the Silk Association of America – nine at San Francisco, seven at Seattle, and three at each of Vancouver and Los Angeles. The oriental departure ports were Yokohama, Shanghai and Hong Kong. The North American terminals were New York City and Hoboken. Brooklyn Daily News, February 19, 1931. *Silk Ships Due.* www.fultonhistory.com/Fulton.htm.

In September 1931, 18 vessels from the Orient were expected to land silk on the west coast. Eight were to arrive in San Francisco, five in Vancouver, three in Los Angeles, and two in Seattle (*Banner Silk Cargoes Soon to Reach Coast*, New York Times, September 13, 1931, p. N4).

On March 21, 1932 the *Empress of Russia* and the *Hikawa Maru* were inbound to Vancouver with 3,500 bales of silk valued at over $2.5 million. (BC Magazine, March 21, 1957, quoted in Chamber's fonds, loc. cit.).

In November 1932, 11 ships were scheduled to visit San Francisco, and four to visit other west coast ports. Bales weighed 130 to 140 pounds, and were worth $150 each. The silk from one cocoon was wound on a reel into skein varying from 500 to 1,000 yards. There were 900 skeins to a bale. Threads used to make silk stockings, were made up of four to ten strands. Utica (NY) Observer November 2, 1932. The Far East is Shipping $30 million of Raw Silk to America. www.fultonhistory.com/Fulton.htm.

Security Pacific National Bank Photograph Collection/ Los Angeles Public Library

The Port of Los Angeles was the last Pacific Coast port to open which handled the import of raw silk. This picture was taken in 1930 and shows Captain Yamaguchi opening the first bale of silk for inspection by U.S. Collector of Customs Louis Schwoebe. Although raw silk was not dutiable, due to its high value, U.S. customs followed shipments across the continent to the final consignee. Bales were also inspected to ensure that dutiable items which might be hidden in the bales, were not being smuggled into the U.S. The two men are holding packets of raw silk, which were the normal content of the bales.

In November 1932 it was estimated that $10 million worth of silk was to be landed at west coast ports.. Eleven ships, with 40,000 bales of raw silk were expected in San Francisco, while four other ships were expected at other west coast ports (Syracuse NY Herald, November 8, 1932).

More than 22,000 bales of raw silk, worth $4.4 million, were discharged in Oakland CA in 1932. In 1930, no silk was landed there (Oakland CA Tribune, December 30, 1932).

In March 1933, 23 ships carrying raw silk were expected to arrive in west coast ports. Eleven ships – *Chichibu Maru, Wales Maru, President Jackson. Atago Maru, Tai Ping Yang, President Grant, Bordeaux Maru, Tatsuta Maru, Cuba Maru, President Coolidge* and *Oregon Maru* were expected in San Francisco. Five were expected to dock at Los Angeles, four at Vancouver and three at Seattle (*Silk Ships Due*, Oakland (CA) Times, February 27, 1933).

In April 1933, 23 silk laden ships also arrived in west coast ports. Eleven went to San Francisco, six to Los Angeles, and three each to Seattle and Vancouver (Oakland (CA) Tribune April 24, 1933).

Twenty three ships carrying silk were expected at west coast ports in December 1933. Ten were to dock in San Francisco, seven in Los Angeles, five in Seattle and one in Vancouver (*Silk Ships Coming*, Oakland Tribune December 26, 1933).

Twenty-six ships carrying raw silk were expected to arrive in west coast ports in April 1934. Eleven were to dock in San Francisco, seven in Los Angeles, five in Seattle and three in Vancouver (Oakland (CA) Tribune, March 14, 1934).

PREPARATIONS FOR LANDING

Ships destined for Vancouver and Seattle/Tacoma usually stopped at Victoria BC. Railway operating and traffic officials, and customs officers boarded the ships there. During the few hours it took the ships to reach their final destination, the officials prepared the necessary documents. In addition to the custom's documents, the ship's papers were examined, and the number of bales of silk, their consignees and their destinations were recorded. Railway officials prepared the necessary waybills for each consignments to their ultimate destinations, and planned the loading of each railway car. By the 1920's, if the weather was fine at Victoria and San Francisco, the ships were met by seaplanes, which rushed the documents ashore, so that all of them were in order when the ship docked (*Here's Real Business Romance*, Union Pacific Magazine, January 1937, pp. 8-9).

Shortly before a ship docked, the holds in which the silk was stored, would be unsealed and opened, so that all was in readiness to unload them as soon as the ship was tied up at the dockside (*Handling Silk*, loc. cit.).

To save time the railways called out stevedores ahead of the estimated time of docking of the ship. The stevedores were paid regardless of whether they could load trains or not. There might be as many as 60 stevedores and six checkers involved. The stevedore's employers, were paid about 80 cents per hour per man (Webber, loc. cit. Chapter 7).

Incidentally, the charge by stevedoring companies to load bales of raw silk was 80 cents per ton. This was twice the rate for any other commodity. It was also considerably more than the wages paid to the stevedores. (Webber, loc. cit.).

NATURE OF LADING AND CUSTOMS

Throughout the history of silk trains in North America, the most common lading was bales of raw silk. Often, manufactured silk, i.e., silk fabric, usually dyed, was also delivered to North American seaports. This was sometimes carried on silk trains, but more often as head-end traffic on regularly scheduled passenger express trains. Very early in silk train operations, silk-worm eggs were also carried on silk trains (see Appendix One).

Raw silk was not dutiable, but entered North America under a classification called "immediate transportation entry goods." Customs officers recorded and supervised the transfer of the silk between ship and train, and inspected each bale against the manifest. The railways had to pay a bond – often around $2 million – to guarantee delivery to the consignee. Customs officers occasionally wished to inspect random bales to ensure that they contained only silk, and not other merchandise on which duty might have to be paid (*Handling Silk*, loc. cit.)

CHAPTER FIVE

TRANSFER OF RAW SILK FROM SHIPS TO TRAINS, AND PREPARATIONS FOR TRANSCONTINENTAL RAIL JOURNEYS

TRANSFER OF RAW SILK FROM SHIPS TO TRAINS

At the port of embarkation in the Orient, the silk was usually the last cargo to be loaded so that it could be the first cargo to be unloaded in North America.

The raw silk was lifted out of the holds in cargo nets and lowered on to the dock. Alternatively, electrically powered conveyors were passed into the ship through special doors high up on the sides of the ship, and the bales moved ashore on them. At this point they were checked by two men, one representing the ship and the other the railway. Each bale was stenciled with "… the destination, point of origin, and the serial number in its respective consignment." Stevedores, using hand trucks, moved the bales to a warehouse, and placed each bale in a different spot for each consignee. Each bale was checked again. This time by customs officers and a railway employee – who then advised stevedores, into which railway car the bales were to be loaded. The bales were then loaded again onto four-wheeled carts. These were assembled into small trains pulled by tractors, to the waiting train(s), and immediately loaded. Speed was essential, consistent with accuracy and safety (*Here's Real Business Romance,* loc. cit.; *Handling Silk*, loc. cit.; G. Marvin, *Fast as Silk,* Vancouver Sunday Province, Vancouver B.C., February 10, 1929).

Marvin (loc. cit.) described the filling of the warehouse as follows:

> "At first sight, that huge shed, reaching away 200 yards or so from end to end of its animated arc-lighted interior, was a moving picture of riot. Everyone, everything in motion – bales, trucks, men, weaving and interweaving in twenty different directions through sharp lights and dark shadows. But no one man ran into another man, not one truck collided with another truck, no combination of man, truck and silk ever hesitated in its course. The whole composition moved as might the constituent pieces in a humanized kaleidoscope, or like well-rehearsed minions in some gigantic pageant of trade."

In the 1920s the bales were often each worth $800 to $1,000 dollars or more when loaded at the Oriental port of exit. They were purchased from the shipper "freight on board" The new owner often borrowed money to pay for the raw silk, from banks, trust companies, silk brokers etc. Consequently, much of the silk was consigned to financial institutions. The owner also had to pay the transportation costs to New York, insurance, commissions, brokerage fees, and

miscellaneous charges known as “petties.” Thus the silk was worth more in New York than at the Oriental port (Marvin, loc. cit.).

Silk trains were made up of express, box-baggage or refrigerator cars depending on the railway. There was a standard coach (with its own heating) at the rear to accommodate the rear end train crew and the armed guards. The Southern Pacific built special box-baggage cars for silk and tea lading around 1900, and the Canadian National and Canadian Pacific followed this practice in the 1920’s. The refrigerator cars in silk service were never cooled, but were employed because they had high-speed capability, their interiors were smooth, and their doors were sealed against the ingrees of dirt and moisture.

EXAMPLES OF UNLOADING/LOADING TIMES

BLUE FUNNEL LINE/CANADIAN NATIONAL RAILWAYS .The Blue Funnel Line’s S.S. *Tyndareus* docked in Vancouver on January 26, 1926 at 15:42. The first bales of silk were landed at 16:13 and train loading commenced one minute later. Loading of the eight car train was completed at 17:45. The train was fully inspected, the car doors closed and sealed by 17:52, when the train left the dock.(Webber, loc. cit., p. 43).

As another example, on May 10, 1926, 3,370 bales were unloaded from the Blue Line S.S. *Philoctetes.* The overall train loading time was two hours and 15 minutes for an average of 2.45 seconds per bale (Webber, loc. cit., p. 43).

On October 19, 1927 the *SS Achilles* docked in Vancouver at 07:25. Unloading the ship began at 07:47 and was completed at 09:52. Train loading commenced at 07:50 and was completed at 10:20. The train left the dock six minutes later, and exited the Vancouver Yard at 10:40. In 1927 silk imports amounted to 62% of Canada’s imports from Japan (*Vignette. The Silk Connection*, Movin’ Vol.11, #3, May/June 1979; MacKay, loc. cit.).

The unloading time was partially dependent on the location of the train relative to the ship’s holds. Then too, it could be raining or snowing while the ship was being unloaded and the train loaded. For shipments in late 1926 and early 1927 the time to load one car varied from 14 minutes to 27 minutes. Senior railway officials up to the General Superintendent of Transportation in Winnipeg scrutinized these times very thoroughly and routinely requested explanations for any delays (Webber, loc. cit., p. 47).

Another example, for which considerable detail is available, is the unloading of the Blue Funnel liner *Protesilaus* on March 17, 1931. The ship docked at Vancouver at 09:35, and unloading the silk commenced at 10:32 (the silk was located in only one hold which apparently held up the operation). Unloading was completed at 12:05. Loading the six railway cars commenced at 11:00 and was completed at 12:34. The train left the dock four minutes later and arrived at the Vancouver yard at 12:51. It left the yard two minutes later. The ship’s gang was called for 10:50, the car gang for 11:00 and the train crew for 12:30. There were two ship’s gangs and five car gangs employed. In summary, it took two hours eight minutes to load the train, or an average of 15.6 minutes per car (Webber, loc. cit.).

The Blue Funnel Line's S.S. *Tyndareus* docked in Vancouver on January 26, 1926 at 15:42. The first bales of silk were landed at 16:13 and train loading commenced one minute later. Loading of the eight car train was completed at 17:45. The train was fully inspected, the car doors closed and sealed by 17:52, when the train left the dock.

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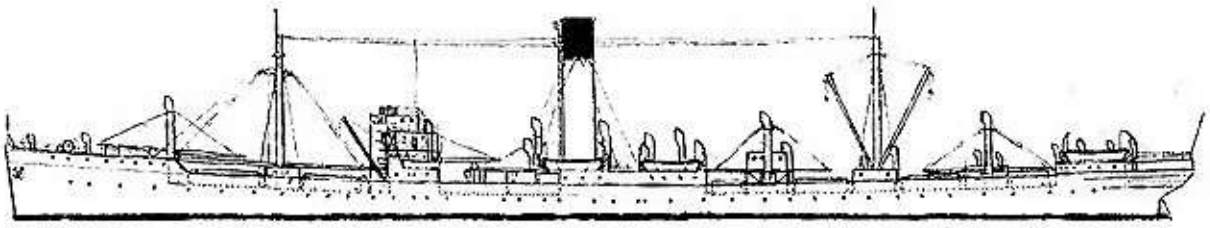
For the landings from Blue Funnel Line ships, in 1926-27, see the table below.

BLUE FUNNEL LINE SHIPS WHICH DELIVERED RAW SILK TO THE CNR AT VANCOUVER 1926-1927(1, 2)

NAME	YEAR BUILT	BUILDER	DIMENSIONS (length x beam in feet)	GROSS REGISTER TONS	SPEED (knots)
ACHILLES	1920	Scotts	507'4"x63'2"	11,426	12
IXION	1912	Scotts	506'x60'3"	10,229	11
PHILOCTETES	1922	Scotts	511'10"x65'2"	11,446	12
PROTESTILAUS	1910	Hawthorn	484'10"x60'4"	9,547	14
TALTHYBIUS	1912	Scotts	506'x60'	10,224	11
TYNDAREUS	1915	Scotts	507'x63'2"	11,347	12

(1) National Archives of Canada, RG 30 CN records, via Webber, loc. cit.
(2) See website: www.RedDuster.co.uk/BlueFun

The Blue Funnel line's SS *Achilles* landed almost 4,000 bales of raw silk in Vancouver on September 24, 1927. And on the 26th, 5,000 bales were landed from the *London Maru.* Both shipments moved east over the Canadian National Railway (Kamloops Sentinel, September 30, 1927).



D.H. Jones, "Blue Funnel Line Steamers," Plastic Ship Modeler 1997 #2.

The S.S. Tyndareus was built between 1915 & 1916 for the "Blue Funnel" line for trans-Pacific service by the Scotts Shipbuilding Company of Greenock. She also carried a small number of passengers. Her single prominent funnel, heavy kingposts and derricks were typical of many Blue Funnel vessels. Many of the

Company's ships were named after classical Greek heroes (www.red-duster.co.uk/BLUEFUN13.htm..

In calendar year 1931, 14 Blue Funnel Line ships landed 2,548,797 pounds of raw silk at Vancouver, all of which was moved east over the Canadian National. The railway's revenue was $228,947. In 1932 there were seven ships involved to June 27, landing 694,829 pounds of silk. The railway's revenue was $41,805 (National Archives of Canada RG 30, via Webber, loc. cit.). The last year for CNR silk trains was 1933.

CANADIAN PACIFIC STEAMSHIPS/CANADIAN PACIFIC RAILWAY. The *Empress of Russia*, arrived in Vancouver on a December night in 1927. She was due in at noon, but actually arrived around 23:00, having been held up en route by a bad storm off the Aleutian Islands. She carried the usual allotment of passengers, among them His Royal Highness Prince George (of Great Britain – the future Duke of Kent) and about $4 million worth of raw silk.

The first silk was loaded in a railway car at 23:21, and the last of the approximately 5,000 bales, was loaded at 03:23. The last car was completely checked and sealed (against moisture, dust and theft) at 03:35. The train of 15 cars left the wharf at 03:45. It took 17 minutes on average to load each car. The bales were stored, eight high. Each car held 470 bales, weighing 27.7 long tons, and worth $376,000 (Marvin, loc. cit.).

On the previous shipment to arrive in Vancouver on the *Empress of Russia*, it took 11.3 minutes to load each car. The slow loading could have been due to any number of factors, but the fact that it was at night on a cold December's day, and perhaps raining, could have been factors (Marvin, loc. cit.).

OSAKA SHOSEN KAISHA/CHICAGO, MILAUKEE ST. PAUL AND PACIFIC RAILROAD. On October 29, 1914, the *Chicago Maru* of the Osaka Shosen Kaisha shipping company unloaded in excess of $1.1 million worth of silk bales, at Tacoma. This was the largest shipment since the inauguration of the agreement between the shipping company and the railroad. The ship arrived at 23:00 and was on its way by 06:00 October 30. (F.J. Alleman, *Handling Silk from Boat to Train*, Milwaukee Magazine, February 1915).

AMERICAN PRESIDENT LINES/GREAT NORTHERN RAILWAY. The first depot of the Great Northern Railway in the Seattle area was built at Smith Cove in 1892. Several piers and a rail yard designed to handle transcontinental trains were constructed. The piers were more than seven blocks long and had a total of seven miles of railway track (www.historylink.org/essays/output.cfm?file_id=3418).

The *President Grant* arrived at Seattle pier 41 on June 10, 1925. She carried 3,221 bales of raw silk. She docked at 15:15, and commenced unloading at 16:03. The ship was unloaded by 17:55. Loading the 12 baggage car train commenced at 17:00, and the train left the pier at 20:20 (Daily Journal of Commerce, June 24, 1925 via Iseminger loc. cit. p. 27).

PREPARATIONS UNDERTAKEN BY RAILWAYS TO RECEIVE SILK TRAINS

The main purpose of railways is to move goods. There are a myriad of goods to be handled which requires a substantial breadth of knowledge of time and motion. In the case of silk, there must be added to the foregoing requirement. an appreciation of high product value and vulnerability (RH Stober, GL Iseminger and M. Evoy, *Silk Trains and Other Commerce on Hill's Road,* Great Northern Railway Historical Society, reference sheet #264, September 1988).

For reasons to be described, speed was essential in silk train operations. Over the years considerable thought was put into how this might best be achieved. By the 1920's, the movement of silk trains was a well choreographed event. This section will start with some summaries, and will then be followed by a more detailed description of how silk trains were handled by individual railways.

Normally, over one weeks notice was given the railways, prior to a load of raw silk arriving by ship. The railway then began to gather equipment, and otherwise prepare for the arrival of the silk. This effort would involve the Division Superintendent, Chief Dispatcher, Yardmaster, Roadmaster and Trainmaster on the company's western most division (Jones – Cascadian, loc. cit.).

The routing of silk trains across the Continent was decided either by the Division Superintendent of the receiving railway at portside or by the owners of the raw silk. In the case of the Canadian National, the only interchange appears to have taken place at Buffalo, NY. One of four eastern US trunk roads got the onward business. At least, in the first year of operation, the four roads got the business equally. The Canadian Pacific appears to have interchanged almost exclusively with the New York Central at Ogdensburg NY.

For the US railways there was much more flexibility as will be described under the various companies (Chapter Seven). However during the existence of the United States Railroad Administration (December 1917 to March 1920), the Administration decided on the routing of silk trains, and indeed of all trains in the US. Sometime in the 1920s the Silk Association of America chose the routes, by which time there were around 20 trains per month leaving west coast ports. It does not appear that the Silk Association routed cars in Canada *(Handling Silk,* loc. cit.).

The Division Superintendent of the receiving railway at portside had the responsibility of advising officials of his own, and receiving railroads, of the date and likely schedule of each silk train. He was often able to provide up to two weeks notice to the officials noted below (Lamont, loc. cit.).

> A railway vice-president would arrange for insurance, and a railway lawyer would arrange with customs to move the shipment through the system as quickly as possible. A supervisor of transportation would arrange for the routing to the New York area. Guards to accompany the shipment would be arranged for.
>
> Dispatchers would provide estimated time of arrival of the silk train in each sub-division. Thus, each dispatcher could decide well ahead of time as to where trains would go into sidings to let the "silker" through without hold-up.

Yardmasters would ensure that the yard at the seaport was ready to let a silk train through it without interruption. And that the ground crews would be in place and the silk train spotted as required on the wharf. His colleagues at crew change points, along the route would ensure that all was in readiness, to allow crews and locomotives to be changed as quickly as possible. And, that the necessary ground crew was in place to inspect the train when at arrived.

Trainmasters would arrange for rolling stock to be assembled. Each car would be jacked up, and wheels and brasses inspected and replaced if required. The journal boxes were thoroughly lubricated. The interior of the cars were lined with heavy paper, and all projections, were removed or covered. Doors were sealed against the ingress of moisture and dust. Steam pipes, if any, were disconnected. By the 1920's and 30's wooden cribs were installed, so that the bales of silk would not move during transit. Accommodation for the rear-end train crew and the armed guards was passenger rolling stock. It might be a combination baggage and express car, or a passenger car – perhaps an immigrant car or a second-class passenger car. It had to have its own heating, lighting and cooking facilities. The rear-end crew changed at every divisional point, but the guards changed less often. Trainmasters, through their locomotive foremen and master mechanics, also had to ensure that locomotives in peak condition were available at the wharf and at all crew change points. Railways used the same locomotives on their silk trains as they did on their named passenger express trains. They were generally fairly new, and all were built for speed. Since silk trains were generally shorter, and hence lighter, than passenger express trains, it was relatively easy to meet and exceed track speeds.

Roadmasters ensured that the track under their supervision was in the best condition possible. Track foremen inspected their track very thoroughly, and brought it up to the peak of perfection. Where feasible, the causes of slow orders were eliminated. Culverts were cleared of debris, so that freshets would be less likely to flood the right-of-way. Troublesome switches would be spiked shortly before a "silker" was due. Some railways, always spiked the main line ahead of a silk train. In the Rocky Mountains and the Precambrian shield in Northern Ontario, sectionmen would inspect the track an hour or so ahead of the "silker" to remove any fallen rock. A silk train traveled about 1,000 miles every 24 hours. Therefore it was not unusual for 1,000 miles of track to be prepared ahead of the silk train.

Train crews at the ports were called well ahead of the expected arrival of the silk ship. They had plenty of time to assemble their train, and make all the necessary final inspections. Telegraph operators and station agents in the first division over which the train would run were also alerted. At en route crew change points, crews, telegraphers, and station agents were generally given two hours notice (Lamont, loc. cit.).

When the port side train crews checked in with a dispatcher, they were who handed two copies of the "flimsies" he had prepared – one for the engineer and the other for the conductor at the rear of the train. These were the written orders governing the movement of the train. A representative "flimsy" for a Canadian National silk train is shown below (issued February 4, 1931)(Webber, loc. cit., p. 58).

> Engine 5039 run silk extra leaving Port Mann on Wednesday, Feb. 4th, as follows, with rights over all trains. Lv. Port Mann 10:00. Arrive Boston Bar 13:28.

The speed anticipated was around 33 mph. The Canadian Pacific likely issued similar orders, but some of the US railways, only gave silk trains rights over other second class and inferior trains

As soon as possible after a silk-carrying ship docked the various operating regions over which the silk train would move, were notified. They were given a schedule based on the maximum time in which the silk train would be expected to move over a division. Each division competed with others to minimize the time "the silk" would be in its region. Each division informed the next, as well as regional management, of the progress of the train (*Handling Silk*, loc. cit.).

The length of a silk train was governed both by the amount of silk landed by a ship, and the requirement for speed (short trains could travel faster than long ones).

When loading of the train was complete, and the guards had checked the door seals on the cars, the silk train conductor notified the dispatcher. The train was given permission to proceed, and the dispatcher notified all the officials involved. These included the senior regional officials in Winnipeg, and senior management in Montreal, for Canadian trains.

A document providing the following information was supplied to silk train conductors for each car:

- name of originating railway, number of railway car and railway which owned it, date car was dispatched, name and location of shipper;
- route to destination naming each railway in order;
- name and location of recipient;
- nature of car lading;
- date and location where car was interchanged with each railway;
- instructions for handling car.

Reference: posted on NKP@yahoogroups.com February 2, 2010 by stealrrNKLPL8@hotmail.com steal/rr in reference to shipments of fruit by refrigerator cars.

END NOTES

Webber, loc. cit.
Handling Silk, loc. cit.
Letter from D. Jones, CPR Special Projects and Corporate Archives to R. Chambers, dated 1977-03-21. (Chambers fonds, loc. cit.)

Hubbard (loc. cit.).
A.R. Boone, Popular Science Magazine, April 1935, pp 1-19.

UNIQUE COSTS

The railways themselves obviously had extra costs for operating silk trains, compared to ordinary operations. There were the incremental costs in preparing cars for silk shipments, in checking and maintaining the road bed, in giving the "silks" rights over all other trains, wages for inspectors at crew change points, and in communication costs, etc. And, there were additional costs for the guards (wages, meals, etc). (*Handling Silk*, loc. cit.; R. Thornton, e-mail to the author dated August 28, 2008).

But the most significant costs had to do with insurance and Customs bonds.

Railways did not normally insure their cargoes, this being the responsibility of the owners of the material being transported. However, in the case of raw silk, it was so valuable, that the railways did insure it. (This was in addition to the silk owners insurance). Lloyd's of London was the main insurer. A common charge was 6% of the value of the shipment, charged on an hourly basis (Railway and Shipping World, March 1904; CPR archives).

For a one million dollar shipment of silk, the insurance premium was $600.00 per hour. For an 80 hour trip from portside to a New York City area warehouse the total premium was $48,000.00. For this reason alone, railways tried to maximize the speed of their silk trains, and so shorten the time in which they operated them.

While charging railways insurance premiums based by the hour is widely accepted in silk train literature, it has been questioned. One author claims that silk was insured like most everything else – from a port of entry to its destination in the East, irrespective of the time taken in transit (G. Marvin, *The Luxury Express. Even British Royalty is Sidetracked for the Silk Train*, Baltimore Sun, in Jameson fonds, loc. cit.).

The other major cost was the interest on the bond required by U.S. Customs. (Canadian Railways had to have similer bonds – CPR Archives, loc. cit.). In the 1920's the usual bond required was $2 million. It could only be discharged when Customs was assured the shipment had been received by the consignee. The interest amounted to around $330.00 per day. Of course, the railways carried other cargo for which they had to be bonded, but the size of the bonds were not nearly as significant as that required for raw silk.

SUMMARY OF ROUTES FROM THE WEST COAST OF THE UNITED STATES TO CHICAGO IN 1906.

Seattle to Chicago	
Chicago, Milwaukee St. Paul and Pacific	2,238 miles
Great Northern Railway and connections	2,239

Northern Pacific Railway and connections	2,323
Burlington Route and Northern Pacific via Billings	2,438
Union Pacific via Portland and connections	2,493

Portland to Chicago:

Oregon Short Line, and Union Pacific, and connections	2,311
Northern Pacific and connections via Tacoma	2,463
Burlington Route and Northern Pacific via Billings	2,562

San Francisco to Chicago:

Union Pacific, Southern Pacific and connections	2,278
Atchison, Topeka and Santa Fe	2,578
Southern Pacific and Denver and Rio Grande Western and connections	2,583
Southern Pacific, and Rock Island Route via El Paso	2,753

Los Angeles to Chicago:

Atchison, Topeka and Santa Fe	2,267
Southern Pacific, and Rock Island Route via El Paso	2,278
Los Angeles and Salt Lake, Union Pacific and connections	2,310

(*Railway Age*, Vol. 42, December 14, 1906, p. 739)

The Chicago, Milwaukee St. Paul and Pacific, and the Atchison, Topeka and Santa Fe railroads were the only two US roads which did not have to interchange with another railroad between the Pacific coast and Chicago. It should be noted, however, that the Great Northern, Northern Pacific and Chicago, Burlingtom and Quincy railroads were all part of the same system. The Union Pacific's main interchange partner was the Chicago and Northwestern at Omaha.

End Notes

(1) Webber, loc. cit.
(2) Iseminger, loc. cit.
(3) L.E. Parton, loc. cit.

CHAPTER SIX

SILK TRAIN DESCRIPTIONS

There have been a number of descriptions of silk trains, which convey the romance and excitement of them, in qualitative terms. This chapter is devoted to them.

The excerpted passage summarized below was written by Sir Henry Thornton, President of the Canadian National Railway System from 1922 to 1932. It gives the closest description yet found of the thinking of railway management with respect to silk trains. It clearly points out the high speeds expected of operating crews and ties this requirement into the "almighty dollar."

> The silk trains roaring across the country while everything else takes to sidings are good examples of what speed means to everyday freightage.
>
> These guarded speed-eating trains appeal to the imagination. There is a constant call for speed from the moment the loaded ship leaves the Orient until the cargo arrives at specially constructed warehouses in New York. A special train waits at the dockside in Vancouver. From the time that the hawser is tightened until that ship has unloaded its hold into the made-to-order insulated express cars, from the time the first bale rolls forth until the train pulls out for its race, is exactly two hours and 31 minutes.
>
> Through the mountains, across the prairies, cut through the bottleneck of Winnipeg and along the bush of Ontario wilderness, the terrific race is continued. Armed guards protect the cargo; the best engine crews compete for speed and even bet on their ability to beat the record. Onward day and night while even passenger trains take the siding while every dispatcher and operator is at his key to 'highball her through' onward that silk train goes fighting against time from the minute it leaves the Pacific Coast until it turns over its cargo 74 hours later at Buffalo for another frenzied dash to New York City.
>
> A minute clipped from the record of a difficult stretch of track is something for enginemen to talk about – until a newer record is made. Sometimes when the blizzards rage and the drifts pile high - the CN's bill for snow removal is $4.5 million per year - a thousand men will be marshaled with the speed of an army going into action, so that tracks may be cleared and those silk trains may thunder along their course in time. It is the greatest fight against time in freight annals and because of that it is the most romanticized.
>
> One hears that the speed is necessary to guard against robbery, to save insurance, to halt shrinkage. But the truth is the prosaic governing power of the almighty dollar. On an average train are 4,000 bales of raw silk worth to the purchaser about $4,000,000, and to the railroad a haulage charge of eight cents a pound. Railroads in these swift days of competition are willing to show considerable speed for that sort of tariff.

(*The Silk Trains*, Lethbridge Herald, September 20, 1929, which was apparently a reprint from the Saturday Evening Post. NOTE: This article is the only reference seen, which gives a railway tariff of eight cents per pound. There are references in the text, to a tariff of nine cents per pound).

An un-named railway dispatcher is quoted (Hubbard, loc. cit.) as having said about silk trains:

> They had a clear board right across Canada. There never was a signal set against a silk train – and God help the railroaders who let one be delayed.

Parton provides a short summary of silk train operations in the following passage. "Flying forts" refers to the speed of silk trains as "flying," with the number of armed guards aboard them turning the trains into forts (L.E. Parton, *Flying Forts May Supplement Silk Guards*, Syracuse NY Herald, October 24, 1928).

> There is a melodramatic set-up of armored cars, secret codes, airplane dashes out to sea, great racing trains, manned and munitioned like battleships, making weekly dashes across the continent to provide milady with silk stockings. Each train carries an engineer, fireman, conductor, flagman and brakeman and 25 guards carrying the most modern precise and deadly shooting equipment. For the silk specials the track is sometimes cleared as much as 1,000 miles ahead. There is no schedule. Each train is run as fast as is humanly and mechanically possible.

An article entitled *Silk Cargo Speeded to Loom in Thirteen Day Trip from Grower*, in the Billings MT Gazette (December 10, 1927) neatly summarized the transportation of raw silk. It is paraphrased below:

> Aeroplanes, ships, trains and motor trucks expedite the movement of raw silk across 8,500 miles from China and Japan to the USA. The USA is the world's largest silk manufacturer.
>
> In 1878, raw silk imports into the USA amounted to ca. 1.2 million pounds. In 1927, to June 30, 73.4 million pounds were imported. Over this period the price varied between $4.31 and $5.62 per pound. Between 1878 and 1927 the annual value of imports rose from $5.1 million and $412.5 million per year. The Orient produced about 80% of the world's supply of raw silk.
>
> Thirteen days after a 2,000 bale cargo was loaded aboard ship it arrived in New York City. A seaplane met the ship at sea, and flew the customs papers and bills of lading to the Puget Sound port. Customs officers checked the papers so there would be no delay, while the bills of lading were forwarded to New York by air.
> .
> It took three hours to load the train and 85 hours to get the silk to the New York area (i.e. three days, 13 hours). Silk trains left west coast ports 20 times per month.
>
> Speed was essential. For example, the interest charges on a cargo of silk worth $300 million reached $1,000 per day. Delay, meant a loss to an importer who must sell silk into a continuously fluctuating market, but also to the manufacturer who had to keep mills operating. Also, in speed lay safety against theft. Armed guards protected the specially built dust and moisture proof cars.

> When the trains terminated in Hoboken and New York City, the silk was claimed by its owners on presenting the bills of lading. If the bills of lading hadn't arrived before the train, the owners gave the railroads a bond. The silk was delivered to the mills by motor truck. Some of the silk was stored in vaults to await testing by the American Testing Company to confirm the quality of the silk. When necessary, silk was conveyed across the Hudson River by barge, and either warehoused or delivered direct to mills.

John Thompson wrote about silk trains in a more dramatic and less concise fashion, as follows (J.A. Thompson, *The Flight of the Silk*, Railroad Man's Magazine, October 1, 1930, pp 326-333).

:

> Way for a silk train! Hottest hot shot of them all. Lord of high iron. Eighty hours from the Pacific Coast to New York. Faster than the fastest all rail passenger service!
>
> Twenty-five armed guards protecting the precious million–dollar cargo. No schedule other than the greatest possible speed consistent with safety. Clear board for the silk. You drags!
>
> As a topic of general conversation silk trains are taboo, banned, forbidden, disallowed, barred, excluded, unsanctioned." for railroad officials. Silk traffic was very subject to theft. Utmost precautions were taken to keep information on the routing of silk trains from unauthorized hands. Unexpected rerouting at the last minute was one device used to avert potential holdups. Train times were constantly changed.
>
> New York is the clearing house for the raw silk trade. The valuable bales that may some day be milady's silk stocking or men's neckties are stored there in great steel-vaulted and heavily guarded warehouses. From these warehouses silk is taken in armored cars to the mills of the various buyers.
>
> Why the speed? Silk is not a perishable commodity. However it was very costly, averaging five dollars a pound. In a million dollar shipment a great deal of money was spent in interest on a daily basis to pay for the silk in transit. As well, insurance rates were high, being charged on an hourly basis. Every hour that was saved in transit put extra money into the hands of the importer. Also, the shorter the time that a railway had a silk train in its care the lower the likelihood of theft. Silk was the only lading which railways insured to their own account – again, calculated on an hourly basis.
>
> Silk was the last cargo to be loaded on ships leaving the Orient, so that it could be the first cargo unloaded at West Coast Ports. By the 1920's when a ship was still far out to sea, at least in good weather, it was met by a seaplane. The plane returned to the ship's designated port of arrival with all the invoices, bills of

lading, customs entries and other necessary documents to process the silk shipment. By the time the ship arrived, and was tied up, all entry formalities had been completed, and unloading into a waiting train commenced immediately.

As the bales are passed from the ship, agents inspect the marks on them; see that the seals have not been tampered with." The cars "--- are quickly loaded, checked and sealed,"---- and the crew climbs aboard.

Although silk was not dutiable, due to its high value, it traveled across the continent in bond to New York. Customs officials usually only recorded the number of each individual bale at the port of entry. The bales were more thoroughly inspected in the terminal warehouse, before they were released to the owner.

Silk trains were most often eight to ten cars long, with a crew accommodation car at the rear. All cars were passenger train rolling stock, so that the trains could travel at passenger train speeds or faster. The silk carrying cars were made as dust and damp proof as possible. But they were not cleaned on the outside, so that they would not be too conspicuous.

Ready? All aboard! Let's go! Ride her, hogger! The right-of-way, a clear track and no schedule but the fastest running time possible. Watch the skipper, you at the latch there! Highball! She's off! Silk . . . costliest of freight in a steel string of flying fortresses, starting on a three-thousand mile run to New York.

The passengers that arrived on the same ship as the silk are likely still waiting for the bags to get through customs, as the silk trains rolls off the wharf. "On her way and how! Passengers! Pshaw, what are they compared to silk? How many of them are worth a million dollars a trainful?" Once off the wharf, and clear of the port, the silk train rapidly "… gets into her stride. On she thunders. Up – up – up over the Continental Divide. Down the other side with a rush. Out onto the plains."

Whoop her up. Eagle-eye! High-wheel this baby! She's *silk*. Get that? My wife's hosiery and may-be Peggy Joyce's next year's underwear in the making. Just raw silk now, but mighty important.

Doing seventy? Make it seventy-five … eighty . . . eighty-five . . . ninety on the next stretch, if you've got the nerve, hogger."

Chief dispatchers watch the progress of a silk train while it is yet a thousand miles away. Everything goes into the hole for the silk. Even widely-advertised transcontinental passenger trains have to give way if necessary.

Strange isn't it, that behind such frivolities as summer frocks and silk stockings, gay ribbons and garters, there should lurk a melodramatic setting of secret codes,

> airplane dashes out to sea, the ever-present menace of desperate bandits, and armed trains hurtling through the country at dizzy speed?

Robert Davis, the first editor of Railroad Magazine, was aboard the CNR's *Confederation Limited* on an October night in 1927. The train was waiting in the hole in Armstring ON for a silk train to run by in two sections, with cargoes valued at more than $7 million. The conductor was quoted as saying (Hubbard, loc. cit.):

> It's the largest shipment of any one commodity that ever crossed Canada – 21 cars, 28 tons to the car. Railway express charges are $9.00 a hundred pounds – a matter of about $100,000 to get the shipment to New York on a running schedule of 80 hours. This train is now 1,958 miles out of Vancouver and is 21 hours ahead of the passenger trains that left there four hours in the lead.

(NOTE: Hubbard loc. cit. stated that this event took place in Armstrong BC, which is not on the main lines of either the CNR or CPR and is very much closer to Vancouver than 1,950 miles. Armstrong ON is on the main line of the CNR and is about 1,980 miles from Vancouver, by 2008 mileage).

Davis went on to write (Hubbard, loc. cit.):

> Two miles westward an aura of light burst against the black night. A whistle screamed as, out of the dark, the headlight shining along the glistening rails, thundered section one with its precious cargo. The brakes groaned, the engine whistled, and the silk special brought up with tremendous clanking.
>
> A new engine replaced the hot monster that had come through the last 147 miles; the train crew gave way to a fresh detachment; the cars were watered, the brakes inspected, the locks on each car examined by special officers; and in exactly four minutes Section One was on its way to the United States at a speed of 55 miles per hour.

Hubbard (loc. cit.) then wrote:

> There was keen competition by the various railroads for this luscious plum, each one doing its best to prove it could deliver the rich stuff faster than its rivals. Every man involved in a silk shipment was expected to be "on his toes." It was an honor to handle a silk train.

An article in the Winnipeg Free Press (*The Silk Train*, Winnipeg Free Press, June 11, 1929 in Jameson fonds, loc. cit.) had this to say about silk trains –

> Heaven can't help the dispatcher who holds it a split second longer than is vital from the explosive wrath of a divisional superintendent.

CHAPTER SEVEN

SILK ROUTES ACROSS NORTH AMERICA

In this chapter, some of the general procedures applying to most railways, will be discussed. Then information specific to the named railways will be described.

Train crews were changed at divisional points which were 150 or so miles apart. Locomotive servicing (i.e., coaling, watering, lubrication) was deemed to take too long a time at crew change points, therefore, locomotives were changed instead. As the incoming silk train pulled to a halt, the air was cut off and the "old" engine uncoupled and moved away. The fresh locomotive, with steam up, was backed onto the train, coupled, the air turned on, and the brakes tested.

While the locomotive was being attended to, car inspectors checked all wheel journals to ensure they were adequately lubricated, and "knocked" each wheel to ensure it wasn't cracked. If the resulting sound was a dull thud instead of a lively ping, the wheel was cracked. The car was "bad ordered" and removed from the train.

At the same time the guards checked the seals on the car doors to ensure they hadn't been tampered with. Then the silk train could move off – with perhaps as little as a three minute stop, which seldom exceeded ten minutes. Reasons for longer delays had to be explained in detail to senior management.

Locomotive tenders could carry sufficient coal to move the train from one divisional point to the next. But water had to be replenished en route. Water tanks were located approximately 40 miles apart. The locomotives in the silk train era were mostly coal fueled and hand fired. Consequently, the fireman had a very challenging job to provide sufficient steam to maintain the high speeds expected.

When a car was bad ordered, and after being removed from the silk train, it was unloaded as quickly as possible, and its contents reloaded into another box baggage or baggage car. This car was sent eastwards, as a head-end car, on the next scheduled passenger express. It might therefore arrive in New York 24 to 36 hours after the other cars on the original silk train.

For general information on North American railways see:

Anon., *Historical Guide to North American Railroads*, second edition, Kalmbach Publishing Company, Waukesha WI, 2000. ISBN 0890243565.

W.D. Middleton, G.M. Smerk, R.L. Diehl editors, *Encyclopedia of North American Railroads*, University of Indiana Press, Bloomington, IN, 2007. ISBN-13: 9780253349163.

B. Yenne, *Atlas of North American Railroads*, MBI publishing Co, St. Paul MN, 2005. ISBN-13: 9780760322994

Wikipedia on the internet.

ATCHISON, TOPEKA AND SANTA FE RAILROAD. Construction of the railroad commenced in 1868 near Topeka KS. By 1888 service was offered between Los Angeles CA and Chicago IL via Kansas City KS. In 1900 the road reached San Francisco CA.

At first, the Atchison, Topeka and Santa Fe had no arrangements with shipping companies. It therefore had to interchange incoming and outgoing oriental traffic with the Southern Pacific, and Occidental and Oriental Railroads. In 1898 it chartered its own shipping company under the name California and Oriental Steamship Company. Service between San Diego and Yokohama commenced in December. This arrangement continued until 1902 when the Pacific Mail Steamship Company signed an agreement with the Atchison, Topeka and Santa Fe. Prior to this the Southern Pacific handled all the steamship company's business (Tate, loc. cit.) At Chicago, Atchison, Topeka and Santa Fe silk trains, interchanged cars with one of the four major eastern trunk roads.

BALTIMORE AND OHIO RAILROAD. The first Baltimore & Ohio train ran in 1830. Its rails reached Chicago IL in 1874, New York City in 1886, and, later, St. Louis (MO). There were very few reports found of silk trains on this road. But as one of the four major eastern trunk roads it probably handled quite a few.

CANADIAN NATIONAL RAILWAYS. The Canadian National was an amalgamation of several railways, only two of which were transcontinental roads – the Canadian Northern and the Grand Trunk Pacific. The legal arrangements leading to consolidation were not completed until the end of January 1923, although the company had operated as a single unit well before that time. Neither Canadian Northern or Grand Trunk Pacific operated any silk trains. Canadian National entered the silk train business in 1925 (see Chapter Six).

In the early 1920's the Canadian National's chief agent in the Orient, C.F. Brostedt, discovered that the existing shipping companies weren't shipping all the raw silk available for export. He made arrangements with the Blue Funnel shipping line, and Japanese silk wholesalers, to deliver raw silk to the Canadian National. The first shipment of silk to New York, left Vancouver on July 1, 1925. The route chosen was the main line to Toronto, thence around the west end of Lake Ontario, east along the southern shore of the Lake, across the Niagara River on the suspension bridge over the falls, and on to Buffalo NY (MacKay, loc.cit.).

The first silk train was made up of eight baggage cars and a crew car. It was guarded by two Canadian National Railway policemen and carried $2 million worth of silk. It reached Armstrong ON in a little over 50 hours (1,963 miles – average speed about 39 mph). It took another 20 hours to Toronto, and a further three to the United States. U.S. Customs partially unloaded, at least some cars, to count bales, and to take samples of their contents. The New York Central took the train from Buffalo to the warehouses of the Manufacturer's Terminal in Hoboken, NJ (MacKay, loc. cit.).

In its first year of operating silk trains, between July 1, 1925 and June 10, 1926, the Canadian National received 15 shiploads of raw silk from the Blue Funnel Company's freighters. The number of bales of raw silk varied from 1,259 to 5,256, for an average of 2,745 bales per ship, and a total of 41,217 bales. The number of railway cars involved per train varied between five

and fourteen for an average of nine, and a total for the year of 1,929. This averaged about 320 bales per car for a total weight of 42,560 pounds (based on 133 pound bales). These Canadian National silk trains were interchanged with the Delaware, Lackawanna & Western (four), Erie (three), New York Central (four) and Pennsylvania Railroads (four) at Buffalo, NY. The elapsed time from Vancouver to the New York area varied between 85 hours 23 minutes and 94 hours 55 minutes except for one run of 105 hours 35 minutes. For an unknown reason, the silk cars on this particular train had been attached to Canadian National passenger train #4 at Winnipeg. The average time in transit was around 90 hours (i.e., three days, 19 hours), including the approximately 50 minutes it took to clear US Customs at Buffalo (see Movin', Vol. 11, #3, May/June 1979). The gross earnings varied between $20,000 and $65,900, with the exception of the "slow" movement where the earnings were only $17,500. The average over the year was $34,500 per train for a total of $516,900 (data from National Archives of Canada RG 30, CNR Records, via Webber, loc. cit. p. 112).

In another report it was stated that a "silker" traveled from Vancouver to Toronto in 71 hours 20 minutes, and from Toronto to Buffalo was three hours 30 minutes. The overall trip from Vancouver to New York City, took 87 hours 20 minutes (via the New York Central). One run made Buffalo in 73 hours and New York in 85 hours (Hubbard, loc. cit.). The total distance was 2,749 miles and the average speed was around 30 mph (R.L. Daniels "Trains Across the Continent," Indiana University Press, 2000, ISBN 0-253-33766-3).

> The Canadian National Railway was one of three railways to build special box baggage cars for transporting raw silk. They were numbers CN 11025 to CN 11036, built in June 1926 by the National Steel Car Company. They were essentially repeats of a similar order by the Canadian Pacific Railway. They were 44 feet 11 inches long (48 feet eight inches over the couplers), built of steel with a steel fish-belly underframe, blind ends, and an arched roof. The trucks were Commonwealth cast steel. The cars were classed as BA-45-A lettered "silk service through baggage." They were removed from service between 1962 and 1974 and scrapped. Throughout their lives the cars were used for transporting tea and other clean lading, as well as silk (G. Lepkey, B. West, editors, "Canadian National Railways," Bytown Railway Society, Ottawa, 1995. ISBN 0921871010, p. 117. See picture in Plates section and drawing on p. 121. G. Lepkey, "A Companion to Canadian National Railways," Bytown Railway Society, Ottawa, 1999. ISBN 0921871031, p.18).

In July 1926, engineer Modeland averaged 50.9 mph between Wainrwright AB and Biggar SK, on a silk train run, covering the 140 miles in two hours 45 minutes (*1921-1936 – Biggar Encyclopedia* – from Google).

All railways have a continuous litany of operating problems, of which employees are only too well aware. Webber (loc. cit. p. 62) captured some of these, involving silk trains, as described in correspondence between the most senior officials of the Canadian National in Western Canada. They serve as examples of what occurred on all railways operating silk trains. The following events took place between Vancouver BC and Jasper AB in October 1926:

55 minute delay in the Yale subdivision due to a rock slide;
23 minute delay in the Clearwater subdivision due to slow running caused by heavy winds and a rainstorm; and,
a four minute delay in the Albreda subdivision for the same cause.

Even so, they were fortunate that they did not experience further delays at this time from washouts in the Clearwater and Albreda subdivisions where all creeks were running full. Obviously, the track gangs had done a superb job in clearing debris from around culverts and trestles (Webber, loc. cit. p.61).

In April 1927 a CNR silk train was held up for two hours by "being delayed by a derailment" in the Clearwater subdivision. The Governor-General's train was also held up by the same derailment (Webber, loc. cit. p. 62).

The largest Canadian National Railway silk shipment occurred in October 1927. It consisted of 21 cars in two trains, carrying 7,200 bales worth $7 million (MacKay, loc. cit. See also comments by R.H. Davis in Chapter Six).

By mid-1931 the Great Northern Railroad was picking up raw silk from Osaka Shosen Kaisha vessels docking in Vancouver. Prior to this, the minimum size load for a Canadian silk train was 1,000 bales, while in the US, railroads there ran silk trains with only 800 bales. The Canadian roads changed their minimum silk train load as a result (Webber, loc. cit. p. 76).

The Canadian National ran over 100 silk trains between Vancouver and Buffalo, en route to the New York City area, between 1925 and 1932. Regularly scheduled passenger trains took 107 hours from Vancouver to Buffalo. Silk trains did this run in 77 hours (Canadian Transportation, May 1967).

From the late 1920s, an increasing proportion of raw silk imported into North America was landed in New York City, having arrived by sea from the Orient via the Panama Canal (see Chapter Ten). As a result of the realtively samll amounts of silk arriving in Vancouverin the early 1930's, it was now shipped east as head-end traffic on passenger trains. For example, the Canadian National's *Continental* was held late in Vancouver on July 16, 1931 so that silk could be loaded (Webber, loc. cit. p.77). The last Canadian National silk train ran in 1932

CANADIAN NATIONAL RAILWAYS SILK TRAIN LOCOMOTIVE

Ron Bailey Collection, Don Smith photograph

Canadian National silk trains were usually powered by 4-6-2 J-4's and 2-8-0 S-2's. The J-4 classes were built between 1914 and 1920. The J-4-a's built in 1920, had 200 psi boiler pressure, 69" drivers, and 38,000 pounds tractive effort. The S-2 classes were built in 1923-24. The S-2-c's had 63" drivers, 185 psi boiler pressure, and 55,000 pounds tractive effort. The photograph is of class J-4-e built in June 1920 and scrapped in June 1961 (M. Barone, *Canadian Silk Trains*, Canadian Railway Modeler, Vol. 34, Train 6, Track 5, November/December 1996; A. Clegg & R. Corley, *Canadian National Steam Power*. Trains & Trolleys, Montreal, 1969).

Bill Bailey, the father of long-time Alberta Pioneer Railway Association member, Ron Bailey, on occasion, operated Canadian National locomotive # 5140. It sometimes pulled silk trains on the 118 mile long Asquith Sub-division between Biggar SK and Watrous SK, with a stop to take on water at South Saskatoon SK (roughly 60 miles from Biggar). Incidentally, all switches were spiked in advance of CNR silk trains (R. Bailey, e-mails to the author August 5, 6 and 8, 2008).

CANADIAN PACIFIC RAILWAY. The 2,900 mile long Canadian Pacific main line was completed between Montreal QC and Port Moody BC in November 1885. The first transcontinental passenger train arrived in Port Moody on June 28, 1886. The first ship to arrive – the sailing barque W.B. Flint - docked on July 27, 1886 with a cargo of tea. This was by far the most important cargo arriving in Port Moody throughout the year, but there was a growing potential for silk, rice and curios. Silk promised to be particularly lucrative, but couldn't on its own support the railway. The Canadian Pacific decided to wait until it secured the Canadian and

Imperial mail contracts across the Pacific Ocean before investing in its own trans-Pacifuc ships. It does not appear that any silk was landed in 1886 at Port Moody (Turner, loc. cit.).

The amount of business which developed with sailing ships in 1886 indicated a very substantial potential. But the Company never knew when the ships would arrive due to the vagaries of the weather – and it was costly to tie up rolling stock in expectation of their arrival. Consequently the railway chartered three old steamships to make the Orient-Vancouver run. (Since they did not yet have the mail contracts they did not want to invest in new ships). By the middle of 1887 the railway had been extended 17 miles westwards to Vancouver and port facilities there were opened by mid-year (Turner, loc. cit.).

In 1886 the CPR hired a firm to act as their agents in the Orient, to direct traffic to them. In September 1886, the Winnipeg Free Press published an interview with Mr. E. Frazer of this firm. He suggested that the Canadian Pacific should get into the business of moving silk across North America. (In that year 20,000 bales of silk were imported into North America, at a total value of about $12 million - or $600 per bale). He later estimated that in 1887, shipping charges for carrying silk across the Pacific Ocean could amount to $2 million. Practically all of this was being earned by U.S. steamship companies with the silk being landed at U.S. ports. It was carried by rail across the United States to New York City, NY, Paterson NJ, Florence MA, and Allentown PA. Naturally, the CPR worked very hard to secure this business (Turner, loc. cit. E. Paterson, *Old-Timers Remember the Thrilling Silk Trains*" Winnipeg Free Press, September 12, 1970).

The first of the chartered steamships to arrive was the *Abyssinia* – on June 14, 1887. In addition to a substantial quantity of tea, she also carried silk. New York received 63 packages, and Montreal, two. This appears to have been the first shipment of silk moved by the CPR. On July 4, 1887, the *Parthia* brought in 21 packages of silk as part of a 2,975 ton cargo. The next morning, the silk was the first of the cargo to be moved east. On December 27, 1887, the third ship chartered by the CPR, arrived after a very rough passage. She brought 165 packages of silk in addition to other cargo. In all, the three ships made nine voyages in 1887. At this time a 30 ton carload of silk was worth between $75,000 and $95,000, i.e., the price of raw silk varied between $1.25 and $1.60 per pound. (JA Shields, CPR Corporate Archivist, September 1, 1987 via Webber, loc. cit.; Turner, loc.cit.).

These early shipments of silk, were moved in box baggage cars attached to fast passenger express trains. An example of one of these was in June 1900, when a crack Canadian Pacific train passed through Winnipeg on its way to New York. It carried several car loads of silk, and 165 passengers who had come from the Orient (Paterson, loc. cit).

The earliest description seen involving Canadian Pacific silk trains was recorded in December 1902. The Ottawa Division of theRailway handled two silk trains that month, which were routed via Carleton Junction ON. The silk had arrived in Vancouver on the *Empress of India*. The total value of the cargo was $2 million, divided equally between two six car trains (*Millions in Silk Trains*, Manitoba Free Press, December 16, 1902).

It is not known what routes the earliest silk laden cars, took to New York City, but they undoubtedly took the Canadian Pacific main line (from Vancouver via Calgary AB, Regina SK, Winnipeg MB, Fort William ON), to Ottawa ON and Montreal QC. By the time the silk trains emerged, they were routed to Prescott ON via Smith Falls ON and Kempton ON. (CPR Archives, 2008-06-16). At Prescott the silk laden cars were run on to a ferry, to cross the St. Lawrence River, to Ogdensburg, NY. From there, they traveled over the New York Central Railroad to either the lower west side yard in New York City or to Weehawken NJ.

> The ferry company (the Canadian Pacific Car and Passenger Company) was founded in March 1888, but it was not a subsidiary of the Canadian Pacific Railway. However, its main customer, between Prescott and Ogdensburg was the Railway. In 1909 it was bought by the Prescott and Ogdensburg Ferry Company. Then in 1930 its name was changed to the Canadian Pacific Car and Passenger Transfer Company when it was bought by the Canadian Pacific Railway Company. The next year the New York Central Railroad became a half owner.
>
> The initial service was by the *South Eastern*, built in 1881, bought by the Company in 1890, renamed *International III* in 1896. She was replaced by the *Charles Lyon* built in 1908 by the Polson Iron Works of Toronto, as an ice-breaking ferry. She was of 1,658 gross tons, 280 feet long, nine knots. She could carry 14 railway cars. The *Lyon* was broken up in 1936. She was replaced by the *Prescotont* built by Davie Shipbuilding, Lauzon, QC in 1930. She was of 302 gross tons, 110 feet long, 11 knots. The *Prescotont* was an ice-breaking tug and fire float, which controlled the ferry float *Ogdensburg*. The *Ogdensburg* was built in 1930 by the American Shipbuilding Company. She was of 1,405 gross tons, 290 feet long, unpowered and could carry 17 railway cars on three tracks.
>
> (The details of the ferry company and its vessels was found in D. Haws, loc. cit.; .J.A.H. Morris, *Fort Town Diary*, in Prescott Journal on line August 20, 2003; pictures in History I in Google *Car Float Ogdensburg*).

At Ogdensburg, the silk had to go through US Customs. On occasion, the cars were partially unloaded so that Customs officials could count the number of bales in a car. They also took a sample out of each lot to verify that it contained non-dutiable raw silk (Jameson fonds, loc. cit.)

In early 1904, $1.9 million worth of raw silk and silk goods was moved from Vancouver to Weehawken NJ. The consignment, which weighed 900 tons, filled 28 cars. Each car held 494 bales weighing just over 32 tons. The value of the silk was about $1.07 per pound (Railway and Shipping World, March 1904, p.83).

In October 1904 two silk trains, carrying silk landed from the *Empress of Japan*, passed through Winnipeg. The first train consisted of 12 cars, and the second had four cars of raw silk and seven cars of other merchandise. The trains were destined for Prescott ON (Manitoba Free Press, October 15, 1904).

In May 1906, the Winnipeg Free Press reported that a mixed train passed through the City. It carried four cars of silk (valued at $200,000 each), three carloads of fresh salmon consigned to Boston and 148 Chinese travellers, proceeding in bond, to New York City (Paterson, loc. cit).

On the *Empress of Asia's* first voyage across the Pacific she carried enough silk to fill 14 rail cars. The silk train left Vancouver at 23:00 on August 31, 1913 and arrived in New York City at 17:00 on September 7. The elapsed time from Yokohama to New York City was 17 days (CPR Passenger Department Bulletin Oct 1 1913, quoted in Jameson fonds, loc. cit.).

In August 1919, four fast trains totaling 55 cars left Vancouver on the afternoon of August 27, carrying $10 million worth of raw silk. It had been landed from the Canadian Pacific Steamship Company's liner, *Empress of Asia*, which had picked the cargo up in Hong Kong. It was the most valuable rail cargo on record up to that time, and was destined for New York City (New York Times, August 27, 1919).

Around 1924, F.E. Trautman, a publicist employed by the CPR, wrote a report about a silk train on which he had traveled. The cargo had been landed from the *Empress of Australia* on October 30 and was taken east in two trains. Trautman was apparently aboard the second train. At North Bend BC (the first divisional point east of Vancouver), the engine was changed, from #2540, the bearings inspected, and the train was underway in four minutes. Later in its journey, the train covered the 136.6 miles between Field BC and Calgary AB (engine changed to #590, six minutes) at an average speed of 42.7 mph. This included the 2.2% climb up the "big hill" just east of Field. The train later covered the 180.3 miles between Calgary AB and Medicine Hat AB (change of engines made in three minutes) at an average speed of 54.6 mph – more or less down hill all the way. The next division, terminating at Swift Current SK, was covered at an average speed of 49.1 mph through rolling country. The train in question was made up of 15 box baggage cars. When it arrived at Fort William ON, the train had made the 1,896 mile journey from Vancouver, at an average speed of 42 mph (F.E. Trautman, *A Silk Train in Transit*, Canadian Pacific Railway, Montreal QC, 1924(?)).

The Canadian Pacific had the Canadian Car & Foundry Company build 50 box-baggage cars specifically for silk lading. Twenty five were built in each of 1925 and 1928, numbered 4900 to 4924 and 4925 to 4949 respectively. They were lined with varnished wood and sheathed with paper in silk service. They were made air-tight to keep out moisture and dirt. They could also be used on passenger trains to carry high quality lading requiring fast service. (Barone, loc. cit.; Chamber's Fonds, loc. cit. attachment to a letter from CP Public Relations and Advertising to Chambers dated March 21, 1977; CP Archives, loc. cit.) These cars could hold 470 bales of silk (61,100 pounds or 30.6 short tons). The value could have been around half a million dollars depending on the current price of raw silk when the train was loaded. Hence a 15 car train could carry over $7 million worth of silk.

On her first voyage, the *Empress of Asia* brought in a load of silk which filled 14 cars. The silk train left Vancouver at 23:00 on August 31 1913 and arrived in New York City at 17:00 on September 7. The elapsed time from Yokohama was 17 days. (CPR Bulletin #5, *Fast Run with "Silk" Special from the Orient*, October 10, 1913 in Chambers fonds, loc. cit.).

The *Empress of Asia* arrived in Vancouver on August 25, 1919. She carried 10,800 bales of raw silk, and 2,053 cases of silk goods. The value of the raw silk was $8.5 million and of the silk goods, $1.5 million. Four silk trains, with a total of 55 cars, left Vancouver on August 26, 1919 for New York City (CPR Bulletin October 1919, quoted in Chamber's fonds. Loc. cit.; *$10,000,000 Silk Trains on Way Here*, New York Times, August 27, 1919).

In June 1925, there was a unique shipment of raw silk. The *Empress of Canada* had loaded $1 million of silk at Kobe, Japan, for Vancouver. At that port it was loaded on a train, which left Vancouver at midnight on June 1 and arrived in Quebec City QC on June 6, on a record breaking run. There, it was loaded on the Empress of Scotland, for Great Britain (CPR Passenger Bulletin, July 1925, quoted in Jameson fonds, loc. cit.; Chamber's fonds, loc. cit.).

In 1925, a 24 car silk train made the 1,893.4 mile run between Vancouver and Fort William ON at an average speed of 37.9 mph. It took 3 minutes less than 50 hours. Earlier, a smaller train of 15 cars, made the same run in 46 hours 11 minutes for an average speed of 41 mph (Canadian Railway and Marine World, Vol. 28, November 1925, p.547).

In 1927 – the best year for transporting raw silk – the Canadian railways carried just over 154,000 bales. This was 30% of the silk landed at west coast ports. The revenue to the CPR and CNR was $1.94 million, of which the CPR received the larger portion (Webber, loc. cit.).

The Vancouver Province estimated that in 1927 the average monthly value of silk passing through Vancouver was over $25 million (*Ask – the History of Metropolitan Vancouver – 1927 Chronology*, see Google). Clearly, much of the early prosperity of the CPR, and of Vancouver, was due to the steady flow of raw silk from the Orient to the New Yor City area (K.L. Holroyd, *Government, International Trade and Laissez-faire Capitalism*, McGill-Queen's University Press, 2002. ISBN 0773523367).

In 1931 the *Empress of Japan* made the crossing from Yokohama to Race Rocks (off Victoria) in seven days 20 hours and 16 minutes. In May of that year, a silk train took three days 13 hours from Vancouver to New York City (E. Paterson, *Old-Timers Remember the Thrilling Silk Trains*, Winnipeg Free Press September 12, 1970),

The last CPR silk train ran in 1933. Between then and 1937 silk was handled in job lots, and after 1937 no silk was carried. (memo from J. Maunder, CPR Public Relations Office Montreal, to G.K. Nield 1948-01-24, in Chambers fonds, Royal British Columbia Archives, loc. cit.).

It is not known how many silk trains the CPR ran. However, an estimate can be made for 1927. In the late 1920's approximately 20 silk trains ran per month from west coast ports to the New York area. The CNR ran one per month on average, and the Canadian railways moved about 30% of the total weight of silk landed. Consequently, the CPR might have operated five to six trains per month, in that year (see notes under CNR and Webber, loc cit p.p. 70-71).

> In the Rocky Mountains, the Canadian Pacific used 5800's, class S2a 2-10-2 oil-fired locomotives in silk train service. They were built between November 1919 and July 1920 and had 26.5' x 32" cylinders. Their tractive effort was 65,900

pounds and their drive wheels were 58" in diameter. The locomotives weighed 362,000 pounds loaded and the tenders carried 3,000 Imperial gallons of oil and 8,000 Imperial gallons of water. East of Revelstoke BC they were "helped" by 5,700's class R3 2-10-0 locomotives. These were built between October 1911 and February 1919. They had 24" by 32" cylinders, and their drive wheels were 58" in diameter. Their tractive effort was 54,000 pounds. The locomotives weighed between 255,000 and 270,000 pounds loaded. Their tenders carried either 2,800 Imperial gallons of oil and 7,800 Imperial gallons of water, or 12 tons of coal and 5,000 Imperial gallons of water (Lavallée, loc. cit.; Jameson, loc. cit.).

In flat country, silk trains were pulled by 4-6-0 class D-10's or 4-6-2 class G-2's. The D-10 class was built between 1905 and 1913 in a number of variants. The D-10h's had 63" drivers, 200 psi boiler pressure, a tractive effort of 33,300 pounds, and weighed 205,000 pounds loaded. Their tenders carried 12 tons of coal and 5,000 Imperial gallons of water. The G-2 class was built between 1906 and 1914, also in a number of variants. The G-2u's had 70" drivers, 200 psi boiler pressure, a tractive effort of 34,400 pounds, and weighed 237,000 pounds loaded . Their tenders carried 12 tons of coial and 5,000 Imperial gallons of water (Barone, loc. cit.; Lavallée, loc. cit.).

CENTRAL PACIFIC RAILROAD. This railroad was completed in 1869 between Promontory Point UT and Sacramento CA. It connected at its western end with its subsidiary the Western Pacific (not to be confused with the later Western Pacific!) which terminated at San Francisco CA. At its eastern end it connected with the Union Pacific.

In 1877 the Central Pacific carried 1.3 million pounds of raw silk, and 82,600 pounds of silkworm eggs. The next year it carried 1.5 million pounds of raw silk, and 137,650 pounds of silkworm eggs. Shipment of silk eggs, which were actually destined for Europe, were soon discontinued (See Appendix One; CPRR Annual Report 1878, K.K Wyatt, Curator of History and Technology, California State Railroad Museum, from the R&LHS Newsgroup, and CPRR Discussion Group 2005-05-21 on the internet).

Central Pacific silk trains often had six baggage cars or less. They maintained 50 mph between San Francisco CA and Ogden UT (F. Famies, *News and Views*, Ogden Standard Examiner July 7, 1945).

Early in 1886, 326,621 pounds of raw silk were landed in San Francisco from the Pacific Mail's SS *Belgic.* The shipment required 16 cars, and the total value was over $1.6 million. The Central Pacific picked up the shipment and using "one of the four trunk lines east of Chicago" delivered the cargo to New York City in less than 15 days. At that time regular freight took 18 to 21 days to cross the country. The freight rate from Yokohama to New York City was eight cents per pound or over $26,000. Most of the cargo was consigned to four major banks and other money dealers, who had partially financed transportation and other costs. The silk had originated in Hong Kong, and Shanghai as well as Yokohama. The Railroad had to pay a $1.5 million bond to US Customs. The railroad was not repaid until letters were received from the consignees

containing signed (at the New York Customs House) certificates of receipt (*A Freight Train's Quick Journey Across the Continent*, New York Times, February 27, 1886).

CHICAGO, BURLINGTON AND QUINCY RAILROAD. This railroad was owned jointly by the Great Northern and Northern Pacific Railroads, and extended westwards from Chicago into Montana (completed by 1895).

In June 1916 the largest shipment of raw silk to date passed through La Crosse WI. There were two trains of eight and nine cars, respectively (La Crosse (WI) Tribune, June 20, 1916).

In January 1923 the largest shipment of raw silk landed at Seattle WA up to that time - $8.25 million, 7,500 bales – was shipped east. The train was delivered to the Chicago, Burlington and Quincy, which operated the train on a passenger schedule, to Chicago IL. Some silk was delivered there, but most was consigned to New York City NY. It was estimated that the silk was produced by over 450 million silk worms (New York Times, January 7, 1923).

Two trains of 11 cars and two of 12 cars were due in Chicago on January 3 and 4 respectively, 1924. The shipment was worth $12 million, and would travel intact to New York City NY from Seattle WA. The scheduled time from Seattle to Chicago IL was 68.5 hours. Each train had 25 armed guards (*Silk Trains Run Faster than the Wind*, Nebraska State Journal, Lincoln NE, January 2, 1924).

In September 1926, the *Arabia Maru* landed 5,200 bales of silk at Seattle WA. It was moved in a train made up of nine baggage cars and six express cars. Each bale contained 100 skeins of raw silk, each skein being made up of 1,500 miles of silk thread! The train was interchanged with the Chicago, Burlington and Quincy which made a record run of 59 hours 36 minutes to Chicago IL. The daily interest charge for the $6 million cargo was $900. All the raw silk was consigned to eastern US manufacturers (New York Times, September 5, 1926).

CHICAGO, MILWAUKEE, ST. PAUL AND PACIFIC RAILROAD. The railroad was commonly known as the Milwaukee Railroad. It reached the Puget Sound area in 1909 (2,174 miles from Chicago). Over 600 miles of the railroad was electrified in 1927 in Washington, Idaho and Montana. The Milwaukee was one of the few railroads which connected with Pacific Coast ports and Chicago IL entirely over its own lines. It had also had a cargo interchange agreement with the Japanese Osaka Shosen Kaisha shipping company.

On November 1, 1909, a Milwaukee train left the Puget Sound WA area with $390,000 worth of silk aboard. The silk had been unloaded from the *Tacoma Maru*. The train had rights over all other trains. The silk was destined for the New York NY area (Hamburg IA Reporter, November 5, 1909).

On October 29, 1914, a cargo of raw silk valued in excess of $1.1 million was unloaded from the Osaka Shosen Kaisha's *Chicago Maru* at Tacoma WA. The shipment arrived at 23:00, was warehoused overnight, and was on its way at 06:00 the next day (The Milwaukee Magazine, February 1915, p.29).

In the 1920's, Milwaukee silk trains, often of 18 cars, with cargos valued at $1 million, passed through La Crosse WI, almost weekly (La Crosse Tribune and Leader Press, January 25, 1920, p. 16).

A shipment of raw silk worth $4.8 million was unloaded from the *Arabia Maru* in Seattle WA early in 1922. The silk was contained in the longest exclusively all-steel baggage-car train ever operated on the 2,174 miles between Seattle and Chicago – 14 baggage cars and one passenger coach, weighing 1,325 tons. The lading consisted of 448 cases of manufactured silk and 4,808 bales of raw silk (The Milwaukee Employees Magazine, February 1922).

In January 1926, 10,124 bales of raw silk, and 60 tons of manufactured silk, worth over $11 million, were landed at Seattle WA, from the *Arabia Maru*, 17 days out of Japan. The Milwaukee Railroad handled the train to Chicago IL, and the New York Central Railroad took it to New York City NY. Two trains were involved, pulling 11 and 12 baggage cars respectively. The train was kept in the yard overnight at its destination and unloaded the following day. The interest charges on the letter of credit used to finance the transportation and purchase of the raw silk amounted to $1,650 per day. It was customary for several silk buyers to combine transportation costs so as to get better facilities to guard the goods more carefully. The owners also paid extra tariffs for expeditious handling (New York Times, January 14, 1926; *Ten Million Dollars Worth of Silk*, Milwaukee Magazine, February and April 1926. The two articles don't agree on all details).

A 17 car Milwaukee silk train passed through Missoula MT on June 30, 1927. Its average speed through the Division was over 50 mph. The silk was worth $4.25 million (Helena MT Daily Independent July 1, 1927).

On November 16, 1928 raw silk valued at over $5 million arrived in Chicago over the Milwaukee Railroad. The shipment was carried in baggage cars in two trains. On November 21 a second shipment arrived in Chicago valued at $2.4 million. All, the cars were destined for New York City (Milwaukee Employee's Magazine, February 1929).

On November 16, 1929 more than $5 million of raw silk arrived in Chicago, from Seattle over the Milwaukee Road. It was shipped in two trains of baggage cars. Five days later a shipment valued at $2.4 million also arrived in Chicago from Seattle (*Nearly Seven Million Dollars Worth of Raw Silk on the Way East*, Milwaukee Magazine, December 1929).

On August 30, 1932, 4,000 bales of raw silk were loaded into 11 cars for shipment to New York City. The Milwaukee took the cars to Chicago where they were transferred to the Michigan Central, a subsidiary of the New York Central. After traveling through Canada from Detroit to Buffalo they were moved over the New York Central itself. (Railway Age, Vol. 93, September 10, 1932. p. 374).

CHICAGO GREAT WESTERN RAILWAY. The Railroad was completed between Chicago IL and Minneapolis-St. Paul MN in 1883 and to Omaha NB in 1903.

A silk train passed through Olwein IA on January 3, 1929. The train had been picked up from the Milwaukee Railroad at Minneapolis MN. The crew change at Olwein took five minutes, and the train was on its way to Chicago IL. In Chicago the interchange with the Wabash Railroad took 30 minutes. The train carried armed guards and had the right of way over all trains (*Silk Train Through Olwein*, Olwein (IA) Daily Register, January 4, 1929).

CHICAGO AND NORTHWESTERN RAILWAY. The Railroad reached Council Bluffs IA from Chicago IL in 1867. For years it was the Union Pacific's favoured connection to Chicago. It also reached Omaha NE around the 1880's.

A silk train averaged 60 mph on the 124 miles between Adams WI and Milwaukee WI in 1926 (*A Fast Freight Run*, Wisconsin Rapids Daily Tribune, August 7, 1926).

CHICAGO, ROCK ISLAND AND PACIFIC RAILROAD. The railroad reached Council Bluffs, IA a day after the Union Pacific/Central Pacific was completed in 1869. Denver CO was reached in 1888, and Tucumcari NM in 1902.

A silk train passed through Davenport, IA, on the Railroad, in early January 1925. There were nine silk cars on the train, eight destined for New York City NY, and one for Chicago IL. There were four special agents, armed with sawed-off shotguns, guarding the train. They rode in shifts over the entire route, on the locomotive, the rear coach and the various cars loaded with silk. The movement of the train was a highly guarded secret, known only to the special agents and the heads of departments. Its schedule was distributed to these personnel in code (*Train Passes Here with a Silk Fortune*, Davenport IA Democrat and Leader, Friday January 9, 1925).

DELAWARE, LACKAWANNA AND WESTERN RAILROAD. The main line ran from Buffalo NY to Hoboken NJ with ferry connections across the Hudson River to New York City. It appears that the major source of Lackawanna silk trains was the Wabash Railroad at Buffalo, with some trains supplied by the Canadian National, there, also.

A silk cargo worth $3.5 million passed through Binghampton NY in December 1924, en route from San Francisco to New York City. Each car of the 10 car train (plus one passenger car) carried silk valued at about $350,000. Railroad police rode the train and carried riot guns in addition to their regulation revolvers. The silk train ran on a faster schedule than passenger trains, and stopped only to pick up water and coal and to change locomotives. "Letters containing schedule of the trains are mailed out at San Francisco to all dispatchers who direct the movement of the trains on their respective divisions across the continent." (Binghampton Press, December 10, 1924, "Silk Laden Train Passes Through City." <www.fultonhistory.com/Fulton.htm>

DENVER AND RIO GRANDE WESTERN RAILROAD. The main line ran from Ogden UT (connection with the Southern Pacific) to Pueblo CO (connection with the Missouri Pacific). It was made standard gauge by 1890.

In September 1932, a silk train made the 235 mile run between Grand Junction CO and Salida CO in five hours 27 minutes. The average speed was 43 miles per hour, through mountainous

territory. The train consisted of ten cars and carried 2,855 bales of raw silk. Three stops were made on the run. Silk trains on the Railroad had rights over all other trains and were permitted to make the best time possible, consistent with safety (The Salida Mail, September 9, 1932). The Western Pacific interchanged its silk trains with the Denver and Rio Grande Western (Kneiss, op. cit.).

ERIE RAILROAD. This road was one of the pioneering railroads in the eastern US, and commenced service in 1851. The Erie Railroad eventually ran from Chicago IL to Hoboken NJ with barge service to New York City NY. As one of the major eastern trunk roads the Erie carried quite a bit of raw silk.

Two Erie silk trains passed through Mansfield OH on the morning of February 24, 1924. They were en route from Seattle WA to New York City NY (*Silk Trains En Route*, Mansfield (OH) News, February 24, 1924).

Fifteen cars, carrying raw silk from Japan, worth over $1 million, passed through Binghampton NY, at 10:30 on July 31, 1925 on the Erie Railroad. The locomotive took on water at Binghampton, while armed guards walked the length of the train and inspected the cars and door seals. The train was received by the Erie Railroad in Chicago the day before and was scheduled in New York City late in the afternoon. (Binghampton (NY) Press, July 31, 1925, *Erie Runs Silk Trains Under Armed Guards*, www.fultonhistory.com/Fulton.htm.

As noted under the Canadian National, that railway interchanged three silk trains at Buffalo in 1926-1927 with the Erie.

GREAT NORTHERN RAILROAD. The Great Northern was completed between St. Paul MN and Puget Sound WA on January 6, 1893. It has the shortest route – 1, 815 miles from Seattle WA to St. Paul MN and ascends the lowest pass in the US Rockies. There were long level stretches of track in Montana, North Dakota and Minnesota, with heavy track, easy grades and broad curves. Extensive maintenance was undertaken to reduce grades, fill-in trestles, and replace wooden bridges with steel or stone ones (*The Great Northern*, Fortune Magazine Vol. VI, #6, December 1932, pp.70-78, 104, 106, 108). It has the distinction of being the only major western US railroad which never became bankrupt. It was long associated in the J.J. Hill Empire with the Northern Pacific and Chicago Burlington and Quincy. Great Northern silk trains were usually interchanged at St. Paul with the Chicago, Burlington and Quincy.

There is an extensive literature on Great Northern silk trains since the Company publicized its silk train operations. More recently the Great Northern Railroad Historical Society and Professor Gordon Iseminger have added to this material. These sources have been heavily drawn upon for the following description of Great Northern silk trains.

As noted earlier the Great Northern and the Japanese shipping firm of Nippon Yusen Kaisha had an arrangement where they would carry each others cargos. Nippon Yusen Kaisha ships had special “silk rooms” to protect their silk cargos across the stormy North Pacific (Iseminger, loc. cit.).

The ships tied up in Seattle at pier 41 or the Railway's pier 88. The bales of raw silk unloaded from the ships were arranged in a warehouse. When unloading was complete, loading the string of baggage cars commenced. When train loading was complete the cars were tagged and sealed and a switch engine pulled them to the Interbay rail yard. There, the rider coach for the rear-end crew and guards was attached as well as the road locomotive. After the brake lines were connected and the brakes tested, the silk train was on its way (W.B. Jones, *Silk Trains – A Record of Achievement*, The Cascadian, April 1961, pp 20-24, as quoted in Iseminger, loc. cit.).

The Great Northern seemed to be unique in two ways in its operation of silk trains. Firstly, a Great Northern silk train did not have rights over all trains – the St. Paul to Spokane fast mail train # 27 had rights over silk trains. Secondly, the Great Northern, unlike other U.S. railroads, sometimes engaged in considerable publicity with its silk trains. Great Northern "silkers" generally had crews that were called in order. However, when a special publicized effort was being made, crews and locomotives were specially selected (Iseminger, loc. cit.).

The first Great Northern silk train was assembled on December 2, 1910. It carried 1,656 bales of raw silk, and 59 packages of manufactured silk goods. The run from Seattle WA to St. Paul MN, was made at an average speed of 28.7 mph. The Great Northern ran its last silk train in February 1937 – the consist was four baggage cars and a coach for the rear-end train crew and guards. Subsequent silk shipments were made in head-end cars on passenger trains. The last move of silk (i.e., presumably as head-end traffic) occurred on March 9, 1939 (Iseminger, loc. cit.).

A Great Northern "silk special" arrived in Spokane at 21:00 on January 30, 1914. It was on its way east in two minutes. The train was made up of seven baggage cars and a chair car for the crew. It was carrying $600,000 worth of raw and finished silk. It was expected to reach Troy in the Montana Division shortly after midnight, requiring and average speed of 43 mph (Spokane Spokesman Review, January 30, 1914, via Blair loc. cit.).

On February 24, 1916, 22 cars of silk on the GNR passed through Whitefish MT. This was the largest shipment to date and occupied three sections of train #28. The total value of the cargo was estimated at $7 million. The shipment had originated in Seattle and was consigned to US Customs in New York City (transweb.org/gnry/lookingback/lb1916.html).

An 11 car silk train stopped for two minutes in Seattle on November 12, 1916. The silk on the special fast train was worth $2 million. It averaged 33 mph, including stops, on the six hour journey reaching Spokane (Spokane Spokesman Review, November 13, 1916, via Blair, loc. cit.).

On March 27, 1920 a special silk train of 12 baggage cars passed through Spokane. It carried over $1.5 million of silk. It was the third such train that March, and the total value of the silk conveyed was over $5 million.. Each baggage car carried 50 tons of silk (Spokane Spokesman Review March 26, 1926, via Blair loc.cit.).

In August 1924, silk loaded aboard an Admiral Oriental Line ship in Yokohama was conveyed to New York City (7,397 miles distant) in 13 days, four hours and 25 minutes. The silk was loaded on two Great Northern trains at Seattle WA. The first train was made up of 10 refrigerator cars

and a passenger coach for the trainmen. The second train (made up of nine cars of silk) left Seattle WA on August 14 and reached New York NY in 73 hours 14 minutes, achieving the record run (Railway Age, Vol. 77, August 30, 1924, p. 387; Billings MT Gazette, August 17, 1924; Great Northern Railway Historical Society, reference sheet #264, September 1998).

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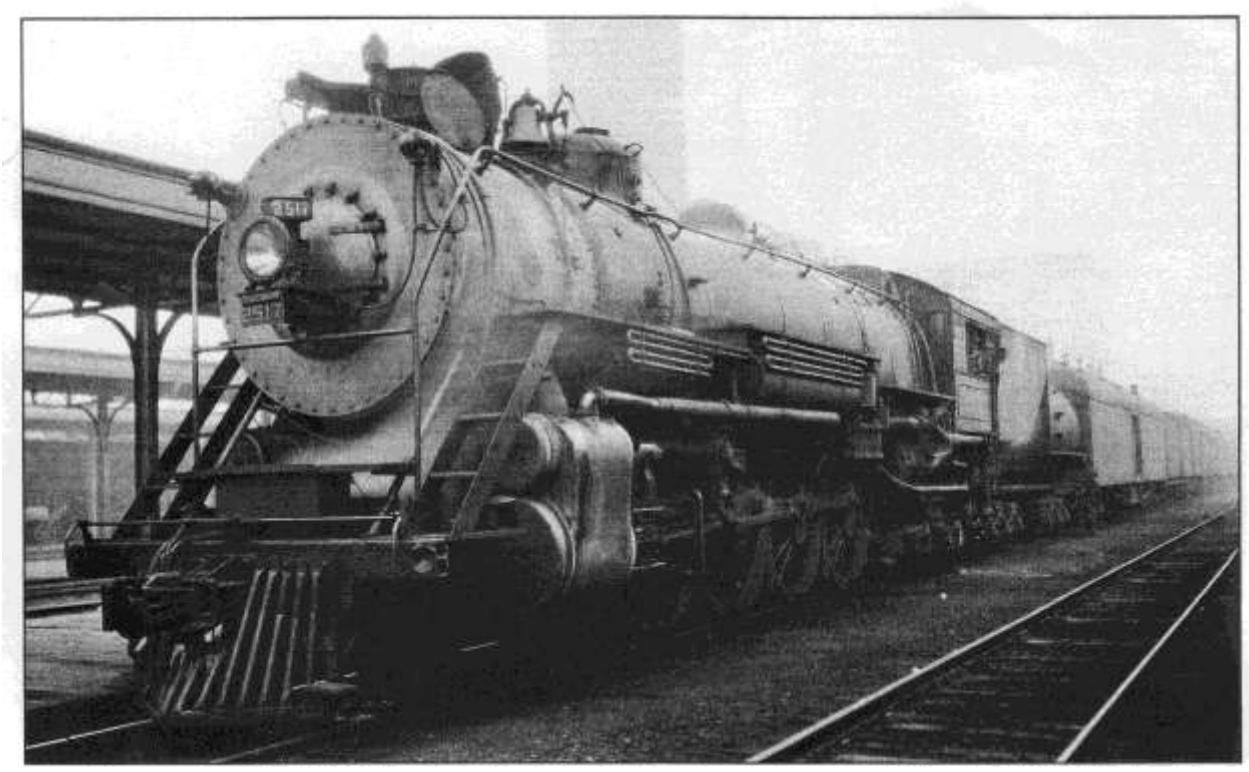
A Table in the Appendix provides details of GNR silk train operation in 1925. There were 41 trains or about one train every nine days. The fastest run to St. Paul MN averaged 39.3 mph and the slowest, 34.2 mph. Train length varied from five to 18 cars, for a total of 372 in the year (average, nine per train).

The Great Northern's most notable silk train run between Seattle WA and St. Paul MN took place in 1925. The locomotive was # 2517. The 18 car train left Seattle on September 25 at 16:30 and made the run to St. Paul in five hours less time than the Oriental Limited. After a short turn-around in St. Paul, #2517 pulled #27 (the fastest mail train in the world) back to Seattle. It made the 3,578 mile trip in slightly less than 100 hours, including stops and 24 crew changes.



Great Northern Railway Historical Society

#2517 was one of 28 class P-2 4-8-2's built by Baldwin Locomotive Works in 1923. Its tender carried 5,000 US gallons of fuel oil and 12,000 US gallons of water. Length of engine and tender was 94 feet six inches, weight 617,000 pounds, 29" by 23" cylinders, 73" diameter drive wheels, 54,823 pounds tractive effort. This was a stock engine and no special treatment was afforded it (Iseminger, loc. cit.; *Minnesota Steam Locomotives"*– Google; G.H. Drury, *Guide to North American Steam Locomotives,* Kalmbach, 1993. Waukesha, WI, 1993. paperback, ISBN 0890242062). The photograph shows #2517 pulling a silk train.

In September 1926 a shipment of raw silk worth $5.4 million left Seattle WA for New York City NY. The interest cost to the owner was over $7,000 per day. At the end of 1926 a cargo of silk worth over $1 million was delivered by the SS *President Jackson*, to Seattle WA. It was delivered in New York City NY in 81 hours 41 minutes, at an average speed of 38.1 mph, carried in nine baggage cars. It was routed via the Great Northern to St. Paul MN, thence by Chicago Great Western to Chicago IL, Wabash to Buffalo NY, and finally to New York NY by the Delaware, Lackawanna & Western (New York Times, September 26, 1926 and December 1, 1926; Railway Age Vol. 81, December 4, 1926, p.1128).

On November 22, 1927 two Great Northern silk trains passed through Havre MT on their way from Seattle WA to Jersey City NJ silk mills. On November 23, an 11 car silk train was expected (Havre (MT) News-Promoter, November 22, 1927).

The Great Northern ran a silk train between Seattle WA and St. Paul MN in 38 hours 50 minutes in 1932 (Seattle Times 1979-12-23 in Google Groups bit.listserve.railroad silk trains)**.**

On another occasion a combination of the Great Northern, Chicago, Burlington and Quincy, and Pennsylvania Railroads, made the journey from the west coast to the east coast in 73 hours, 25 minutes. The elapsed time from Yokohama was 12 days, 14 hours and 36 minutes (Iseminger, loc. cit.).

The special runs were not repeated. But the scheduled time between Seattle WA and St. Paul MN was reduced to 52 hours in December 1924 (the time was 38 hours 50 minutes on the special run). By December 1925 it was down to 48 hours and was later reduced to 46 hours (Iseminger, loc. cit.).

The Great Northern interchanged with the Chicago Burlington and Quincy to Chicago, and with the Pennsylvania beyond Chicago (Iseminger, loc. cit.). New York City was reached in three and a half days. Train consists were typically 15 baggage cars and speeds up to 60 mph were common (Fortune article, loc. cit.).

After 1928, the number and length of Great Northern silk trains decreased, down to four to six cars. And, many of the silk cars were attached to passenger trains. In 1934 and 1935 the total number of silk cars moved was as little as 35 to 50 (Iseminger, loc. cit.).

As noted elsewhere, the economic crash in 1929 substantially reduced the amount of silk unloaded at west coast ports. To try and make up for the business lost in Seattle, the Great Northern began to compete for moving silk unloaded at Vancouver – much to the consternation of the Canadian Railways (Webber, loc. cit.).

There is no record of how many silk shipments ran on the Great Northern between 1910 (the first year silk was transported) and 1937 (the final year).. The first silk train ran in 1922, and the last in 1933. During this time it ran over 325 silk trains. In 1924 the Railroad ran 34 silk trains. And from 1925 to 1932 it ran 307 silk trains – about 38 per year or more than one every 10 days. (Some of this information was reported in ” Fast Silk Train Rushed Goods East,” Spokane Daily Chronicle, August 25, 1959).

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HOBOKEN MANUFACTURER'S RAILROAD. This Railroad was a one mile long switching and terminal railroad in Hoboken NJ, built in 1898. It interchanged with Erie Railroad silk trains and delivered them to a warehouse unloading dock. Its principal traffic was raw silk. The railroad employed armed guards.

As noted elsewhere the transcontinental freight rate for raw silk was $9.00 per hundred pounds of which the Hoboken Road received 5.25 cents. It was successful in appealing to the Interstate Commerce Commission to have its "division" raised to 25 cents. (Railway Age, Vol. 83, December 10, 1927, p. 1184).

ILLINOIS CENTRAL. The Railroad is largely a north-south railway paralleling the Mississippi River. Its main east west line is from Chicago IL to Omaha NE (completed in the late 1880's).

The Illinois Central handled two silk trains through Waterloo IA on November 26 and 27 respectively, 1909. Locomotive 2042 headed the train from Waterloo IL to Freeport IL. The second train of three cars was run as the first section of passenger train #6 and arrived in Waterloo IA just before 10:00 on the 27th. The silk trains were consolidated with #6 and run as one train to Chicago IL. The silk was all in Southern Pacific cars and had been run on passenger train schedules from San Francisco CA. From Chicago IL, the silk cars would travel via Lake Shore and Michigan Southern Railroad, and then over the New York Central Railroad to New York City, NY (*Two Silk Specials*, Waterloo Reporter, November 27, 1909).

On November 29, 1923, a 14 car silk train passed through Waterloo IA, with a cargo worth $6 million. It was received from the Union Pacific at Omaha NE and moved to Chicago IL in 11 hours 38 minutes at an average speed of almost 52 mph. Each car carried about $500,000 of raw silk and was protected by armed guards. It was the most valuable cargo to pass through Waterloo IA up to this time (*Cargo of Raw Silk Worth $6 Millions Hauled Over the Illinois Central*, Waterloo Evening Courier, December 1, 1923).

MICHIGAN CENTRAL RAILROAD. This Railroad had become part of the New York Central in 1867, but retained its own identity throughout the silk train era. It ran from Chicago IL to Buffalo NY (through Ontario), and many silk trains ran over its tracks.

MISSOURI PACIFIC. The Missouri Pacific Railroad ran from Pueblo CO to St Louis MO, and Kansas City KS. It was incorporated in 1876 and absorbed some earlier railroads.

Silk trains which originated on the Western Pacific in the San Francisco CA area, interchanged with the Denver & Rio Grande Western and Missouri Pacific.. The Missouri Pacific passed them on to the Wabash Railroad (Kneiss, loc. cit.).

NEW YORK CENTRAL RAILROAD. By 1869 the New York Central, and its subsidiaries reached from Manhattan NY to Chicago IL (961 miles) with a branch to Ogdensburg NY (where the New York Central later interchanged silk trains with the Canadian Pacific) to Syracuse. A subsidiary opened a line along the west side of the Hudson River from Albany to Weehawken NJ in 1884 (Wikipedia).

In "reading between the lines" it is obvious that the New York Central was very heavily involved in transporting raw silk. However, there is very little in the literature concerning this business, and it is only from the description of silk trains on other railways that a glimpse of the New York Central involvement can be obtained.

In August a silk train made a record run from Vancouver to Ogdensburg NY in four days. The eight cars were checked and opened and samples of the Japanese raw silk taken by the customs agents, after which the treasure train was made in readiness for the 18 hour journey to New York City. Ogdensburg (NY) News August 18, 1911. *Million Dollar Silk Train Rushed Through to New York City in Record Time from Vancouver to Ogdensburg.* http://tinyurl.com/ccz9mz.

One of the largest silk trains handled to date passed through Syracuse on the NYCRR. The train, bound for New York City, was 20 cars long. The value of the silk was estimated as being $90,000 per car. Baldwinsville (NY) Gazette and Farmer's Journal March 9, 1916. *Large Silk Train Passes Through Syracuse*, www.fultonhistory.com/Fulton.htm.

Thirty-four cars of raw silk valued at $3.5 million were ferried across the St. Lawrence River from Prescott ON. This was the largest shipment to date. The silk was shipped from Japan aboard the CP steamships *Empress of Asia* and Monteagle. Customs officials in Ogdensburg examined the shipment. The cars were moved as soon as they were released, by the NYCRR, to New York City. Ogdensburg (NY) News, March 11, 1917. www.fultonhistory.com/Fulton.htm.

A San Francisco to New York City silk train went through Syracuse in March 1917. Since the beginning of the year about 20 trains have gone through, i.e., over two per week. Syracuse (NY) Journal, March 4, 1919. *Million Dollar Shipment of Silk Goes Through City*, www.fultonhistory.com/Fulton.htm.

As noted earlier the New York Central got all the Canadian Pacific's silk train business and in 1926-27, a quarter of the Canadian National's business.

During the height of the popularity of silk, trains of 12 to 14 cars passed weekly over the St. Lawrence division of the NYCRR. Cargos valued at around $5 million were landed at Vancouver and transported to Prescott ON by the CPR. They were ferried across the St. Lawrence River to Ogdensburg, and then entered New York City via Watertown and Utica. Watertown (NY) Daily Times *Japan's Silk Industry*, April 16, 1965, www.fultonhistory.comFulton.htm.

In a letter dated September 16, 1932 to the Northern Pacific Railroad, the New York Central complained about a train which had been assembled with Hoboken and New York bound cars intermingled. The extensive switching required at Albany NY delayed the train 90 minutes (Tarbox, loc. cit.).

NICKEL PLATE RAILROAD. The Nickel Plate was completed between Buffalo NY and Chicago IL in 1882. It was under the control of the New York Central from 1882 until 1916. By purchase of the Toledo, St Louis and Western Railroad in 1921 it connected to St. Louis MO.

It is not definitely known whether this railroad operated silk trains. However, it is known that at least two competitors of the Nickel Plate, the New York Central and Erie did so, so it is logical; to assume the Nickel Plate did also.

NORTHERN PACIFIC RAILROAD. The Railroad reached Tacoma WA in 1887 from St. Paul MN. The arrival of the Northern Pacific in Tacoma broke the monopoly which San Francisco CA previously had on landing raw silk on the West coast.

There follows one example of a Northern Pacific silk train order: "Train Order 21, July 18, 1930. Engine 2161 Run Silk Extra leaving East Auburn Friday July 18th as follows with rights over second class and inferior trains. Leave East Auburn 12:01 pm arrive Ellensburg 3:03 pm." (Tarbox, private e-mail to author nprharesearch@hotmail.com 2007-09-24). (Note: East Auburn and Ellensburg are in Washington State).

Although the Northern Pacific was one of the major carriers of silk, relatively little information seems to have been recorded. A few runs are noted in the following paragraphs.

On August 8, 1914, a Northern Pacific train carrying $1.5 million of silk passed through Ellensburg, WA. The train stopped for five minutes while the engine and crew changed. The consist was 11 baggage cars, and the train had rights over all other trains (Spokane Spokesman Review, August 8, 1914, via Blair, loc. cit.).

A train carrying $875,000 worth of silk passed through Spokane at 17:00 on February 23, 1915. The train was made up of seven baggage cars (Spokane WA Spokesman Review, February 24, 1915, via Blair, loc. cit.).

In June 1924, two trains each carrying one million dollars worth of silk train left Auburn WA on what was expected to be a record run to St. Paul MN. Train #4 took 60 hours on this run, (Auburn Republican June 13, 1924 as reported in financegroups.yahoo.com/group/NPTellTale/message/1024).

Two Northern Pacific silk trains, carrying cargo valued at $8 million passed through Billings MT in July 1924. Each train consisted of 12 cars (Billings Gazette, July 11, 1924).

In early August of 1924 a Northern Pacific silk train made St. Paul from Seattle in 44 hours, 18 minutes (GNRHS, loc. cit.).

Two Northern Pacific silk trains passed through Billings MT on January 20, 1925. The first section of 10 cars went through at 10:30, while the second section of 11 cars went through at 11:05. They were to be broken up at Chicago IL for various destinations (*Big Fortune in Silk Passes Through Here,* Billings Weekly Gazette, January 20, 1925).

On November 13, 1926 a 16 car silk train passed through Helena MT. The article went on to state that an earlier load of silk was valued at $5.4 million, for which the cost of insurance was

over $7,000 per day. The railway had to pay interest on $2 million customs bonds for its silk trains (Helena Daily Independent, November 28, 1926, p.19)

A ten-car silk train was handled east over the Northern Pacific from Auburn WA in January 1928. Crews were changed at Auburn. The silk had been landed at Smith's Cove, Seattle WA, from the *President Jackson.* The train had experienced difficulty across the mountains due to a heavy snowfall (Auburn Globe Republican, January 5, 1928).

A cargo of raw silk, valued at $2 million, passed through Missoula MT on August 10, 1928. The train was hauled by two locomotives, and was rushed over the Northern Pacific system at greater than 50 mph. Silk was handled faster than any other commodity (*Two Million Dollar Cargo Passes Through Missoula,* Helena (MT) Daily Independent, August 11, 1928).

A ten-car train of raw silk left Seattle on June 27, 1932, on an 85 hour schedule to New York. It was successively interchanged with the Chicago Great Western, Wabash, and Delaware Lackawanna and Western. At Chicago, "… one car broke bulk." (Railway Age, Vol. 93, August 13, 1932, p 232).

Also in 1932, a Northern Pacific silk train was loaded in two hours in Seattle WA. It took 81 hours to reach New York City. (Seattle Times 1979-12-23, includes the 1923 photograph of this train. (Google Groups bit.listserv.railroad silk trains).

G. Tarbox, npharesearch@hotmail.com. to AV 2007-09-24

A Northern Pacific Railway silk train at Lester WA, ca 1914, pulled by 2-6-2 locomotive #1673. The 40 locomotives of the W-1 class were built by American Locomotive Company in Schenectady NY in 1910. They had 63" drivers, 150 psi boiler pressure, and the engine weighed

> 265,000 pounds. The tender carried 10,000 gallons of water and 19 short tons of coal. Two members of the class were oil fired (nprha.org). Note that the consist is made up of baggage cars.

The Northern Pacific also used Q-class locomotives of the 2300 series of 4-6-2s on silk trains. These were locomotives used on crack passenger trains and were hand fired. Only elite crews were assigned to silk trains (S. Blair, *How We Hustled Silk to the East,* Pacific Northwesterner, Vol. 25, #4, fall 1981, p.p. 51-57).The Pacific type locomotives were later replaced by larger and more powerful (4-8- 4) Northern type locomotives (Dave Klepper, 2009-04-19, Trains.com Steam Locomotives for Passenger Train Service)

The last Northern Pacific silk train left Seattle in 1933 (Tarbox, loc. cit.)

PENNSYLVANIA RAILROAD .The Pennsylvania Railroad started in 1852 with a line between Philadelphia (PA) and Pittsburg (PA). The Railroad ran west from New York City (Jersey City NJ was reached in 1871, but did not get to Manhattan until 1910) to Buffalo NY (1892), Chicago IL (1858) and St. Louis MO (1870).

Very little was found on silk trains on the Pennsylvania Railroad although it interchanged with some of the Canadian National Railway silk trains at Buffalo and there is an accident report (see Chapter Nine). The Chicago, Milwaukee St. Paul and Pacific, and the Pennsylvania Railroads had a close relationship, so one may assume that some Milwaukee silk trains were interchanged with the Pennsylvania at Chicago (Encyclopedia of North American Railroads, loc. cit.).

A silk train of seven cars passed through Van Wert OH on March 4, 1907. It had started in San Francisco (Van Wert Daily Bulletin, March 5, 1907 – from Google).

In late February 1916 a ten car special silk train, passed through Van Wert OH with a cargo valued at $4 million (Van Wert Daily Bulletin, February 26, 1916 – from Google).

SOUTHERN PACIFIC RAILROAD. The Southern Pacific Railroad was created in 1865. In 1885 it absorbed the Central Pacific Railroad, and reached from San Francisco CA to Ogden UT – the Overland Route. While the Southern Pacific had other significant routes this one was the most important for silk movements

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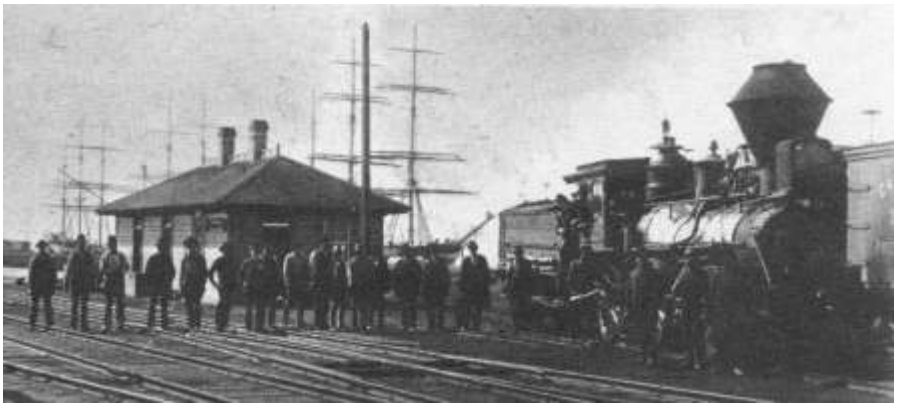
Although the railroad was one of the major conveyors silk, these movements were not publicized, so relatively little is known about them. The Southern Pacific picked up silk at San Francisco CA and delivered much of it to the Union Pacific at Ogden UT.

The earliest photograph of a silk train on any railway, was a Southern Pacific train in the mid-1870's. It was made up of a wood burning locomotive, several baggage cars and a passenger coach at the rear (L. Beebe, *The Central Pacific and Southern Pacific Railroads,* Howell-North, Berkeley, 1963).

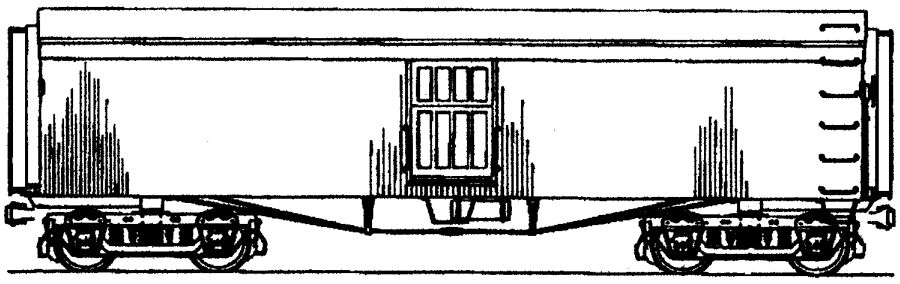


Roy Graves Collection via Railroad Magazine, April 1967, p. 24

Southern Pacific locomotive #116, waiting on a wharf in Oakland CA, to pick ap a silk train. The photograph was probably taken in the 1870s or 1880s, as the locomotive is a wood burner, and the ships are all sailing vessels. The Southern was one of the first, if not the first railway, to operate silk trains. The Company was very active in this business, since they built special cars for silk and tea lading, described below, shortly after 1900.

Around the beginning of the twentieth century the Southern Pacific built 50 silk and tea box-baggage cars numbered 6920 to 6969. There is a picture of one in Beebe's book and in a book on the San Joaquin Railroad (Beebe, loc. cit.; H. Johnston, *The Railroad that Lighted Southern California,* Trans Anglo Books, Los Angeles. 1965, p. 120).

SOUTHERN PACIFIC RAILROAD BOX CAR FOR SILK LADING



Model Railroader, February 1965, p. 44

Kennedy prepared a plan based on the Beebe picture These were wooden cars, weighing 39 tons, with high speed wood framed trucks, 48 feet 8" long, eight feet nine inches wide, and 12 feet eight inches high, with an 80,000 pound capacity. They had a curved canvas roof without a catwalk, diaphragm's at each end and were painted Pullman green (W.G. Kennedy, *Car for the Silk Express,* Model Railroader, February 1965, 99 42-6).

Southern Pacific silk trains sometimes carried tea as well as silk (Hubbard, loc. cit.).

On March 11, 1914, the SS *Korea*, out of Yokohama for San Francisco (4,536 miles) landed 2,421 bales of raw silk, valued at $2.5 million. The voyage across the Pacific took 18 days and the run to New York, commencing with the Southern Pacific took four days, 14 hours and 40 minutes (GNRS, loc. cit.).

In January 1929, the Southern Pacific, Union Pacific, and Chicago and Northwestern Railroads ran a trainload of silk from San Francisco to Chicago (2,259 miles) in 49 hours – a record. The train carried $1.4 million worth of silk. It ran east from Cheyenne WY at an average speed of 67 miles per hour to Grand Island NE. From there to Omaha NE the train averaged 63 miles per hour. The Chicago and Northwestern made the trip to Chicago IL from Council Bluffs IA in 11 hours. Twenty five hours later the train was in New York City NY. In the next ten days, three more silkers left San Francisco CA for the race to Chicago IL, all of which made unexpected bursts of speed. The Southern Pacific, and Union Pacific were letting it be known to their competitors that they were in the silk trains business (Hubbard, loc. cit.).

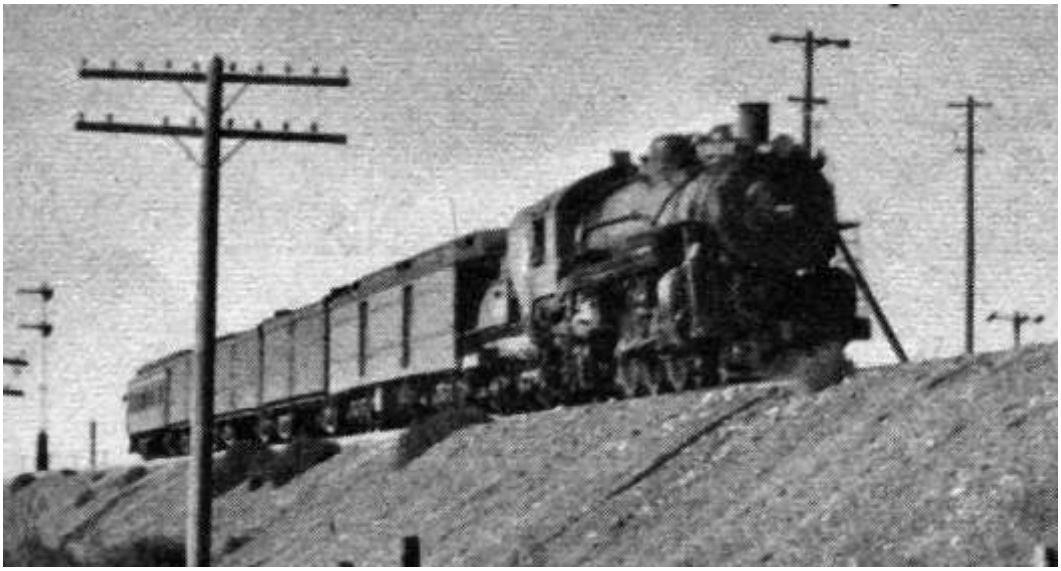
In January 1940, 1,350 bales of raw silk were dispatched from San Pedro Harbour (Los Angeles CA) on the Southern Pacific to New York City NY. This was one of the last major shipments of silk to be received in West Coast ports (Los Angeles Times, January 30, 1940, p.A12).

UNION PACIFIC RAILROAD. The Union Pacific was completed between Omaha NB and Promontory Point UT in 1869. It later operated branches to San Francisco CA, Portland OR, Tacoma WA, and Seattle WA, by wholly owned subsidiaries - Oregon, Washington Railroad and Navigation Company, the Oregon Short Line and the Los Angeles and Salt Lake Railroad. These subsidiaries delivered silk trains to the main line of the Union Pacific Railroad at Salt Lake City UT.

Apart from a 1927 issue of the Union Pacific Magazine the railroad appears to have published very little about its silk train operations. Although it ran its first silk train in 1910, it undoubtedly moved silk in head-end cars on its passenger trains long before that – perhaps as early as 1870. It is possible that the railroad moved more silkcars than any other western railroad.

According to William Jeffers, General Manager of the Railway, the Company moved 52 silk trains in 1927 (Transportation, volume 2, p. 64).

The silk was carried in high speed refrigerator cars, and through baggage cars. Some of the cars ran as head end cars on passenger trains, sometimes as a special train (white flags) and sometimes as the following section of a passenger train (green flags). Crew changes at divisional points were made on the through track (Railway and Locomotive Historical Society, message 7, May 24, 2005 from F.C. Gamst, *Silk on Silk Trains* on Google).



Arthur Peterson Collection via Hubbard, Railway Magazine, April 1965

A Union Pacific special silk train extra, approaching Pocatello ID. The silk had probably been landed at Seattle/Tacoma WA or Portland OR.This train consisted of only four baggage cars and a crew car. It was relatively small by 1920s standards, but was more typical of U.S. silk trains in the early to mid-thirties, when an increasing proportion of raw silk was being imported directly into New York harbour instead of Pacific Coast ports.

Southern Pacific often picked up the silk from ships in San Francisco CA and delivered the cars to the Union Pacific at Ogden UT. The Union Pacific then took some of the trains through to Kansas City KC. They generally consisted of 10 to 12 cars, and sometimes as many as 15. Each car held 470 bales of silk. The trains were pulled by heavy passenger locomotives (O. Ruetti, *Silk Trains Had to go Through and That Was That*, Marysville (Kansas) Advocate, www.mvadvocate.com).

The Union Pacific developed an arrangement with the Admiral Oriental Shipping Company, which operated a 10 day schedule between Yokohama and Seattle. The Company's five steamships carried over $500 million worth of raw silk in three years! One of their ships the S.S. *President Jackson* made the crossing in nine days 50 minutes (Union Pacific Magazine, February, 1927).

The Union Pacific operated silk trains between 1910 and 1929, with a few operating as late as 1933. Their silk trains had right over all other trains. The crews were not specially picked, but were chosen in turn. Bonuses were sometimes paid.

Between 1922 and 1924 Union Pacific silk trains operated on a schedule of 93 hours between San Francisco and New York City. In late 1924 this was reduced to 90 hours (of which, it took 65 hours between San Francisco and Chicago). A further reduction took place in early 1926 when shipments took 60 hours to Chicago and 85 hours overall, to New York City from either San Francisco or Seattle. In 1929 the Union Pacific Railroad and other roads participated in a

speed contest to justify retention of the very attractive silk traffic. One trainload of raw silk was transported to Chicago from San Francisco, 2,259 miles in 49 hours, at an average speed of 46 mph. It was routed over the Southern Pacific, Union Pacific and Chicago and Northwestern Railroads (Omaha Bee News, January 13, 1929. Reference provided by Kyle K. Wyatt, Curator of History and Technology, California Sate Railroad Museum; Hubbard, loc. cit.; Union Pacific Magazine, loc. cit.).

Every few weeks in 1927 a silk train went through Ogden UT. Some were made up of five cars, others of eight cars, and some of 12 cars. The cars were handled with great care and a superintendent traveled with the crew (F. Framies, *News and Views*. Ogden (UT) Standard Examiner April 5, 1927).

The first trainload of silk to land at Los Angeles was moved over the Union Pacific in July 1930. It was accommodated in six all-steel baggage cars (about 230 bales per car). The silk crossed the Pacific Ocean on the Osaka Shosen Kaisha freighter, *Kinai Maru*, which carried 1,400 bales of raw silk valued at $1.4 million. The *Kinai Maru* was one of six new motor ships assigned to the Yokohama-Los Angeles-New York City run. The ocean run of 4,839 miles took 11 days, six and a half hours (*Silk Special Will Pass Through Ogden,* Ogden (UT) Standard Examiner, Wednesday July 30, 1930).

In early December 1930, 51 bales of raw silk were carried in a baggage car on a train which passed through Ogden, UT. It had been landed in Los Angeles Harbour, and was part of a Union Pacific passenger train. The silk was handled with the speed of mail and was guarded by special agents. It was common for four or five car silk trains to pass through Ogden running on passenger express train time (F. Framies, "News and Views," Ogden (UT) Standard Examiner December 8, 1930). At this time Los Angeles was trying to build up business for its new harbour facilities. Given the small size of the silk cargo, it is possible that it was destined for Chicago or Indianapolis, rather than New York City

WABASH RAILROAD. The Wabash ran from Council Bluffs IA (1879) and Kansas City KS (1868) to Buffalo NY (1889) via Canada (east of Windsor – running rights over the Grand Trunk Railway, later Canadian National). It had connections to Chicago IL from the south west and east, while its through route avoided that city. Wabash silk trains had rights over all other trains. The eastern ally of the Wabash for trains to the New York City area was often the Delaware, Lackawanna and Western Railroad (V. Baird, e-mail to the author, May 20, 2009).

It became associated with the Pennsylvania Railroad in 1928 but continued to operate independently.

A seven car silk train went through Montpelier OH on April 1, 1929. It started in Chicago IL, and was to terminate (on the Wabash) in Buffalo NY (Montpelier Leader Enterprise April 4, 1929)

A five car Wabash silk train was forced to detour over the Pennsylvania Railroad due to a derailment at Willow Creek IN. The train was pulled by coal fuelled Wabash 4-4-2 locomotive with 79" drivers and had left Chicago on December 3, 1929. The train averaged 62 mph over the

124 miles on the Pennsylvania detour, and averaged 65 mph over the final 37 miles (Montpelier (OH) Leader-Enterprise December 5, 1929).

A silk train was run from Chicago to Detroit on January 8, 1930 (Montpelier (OH) Leader-Enterprise, January 9, 1930).

On July 14, 1930 a six car silk train was moved from Chicago to Detroit (Montpelier (OH) Leader-Enterprise, July 17, 1930).

A special Wabash train "was handled last Friday (i.e., April 13, 1931), carrying oriental silk from Chicago to Buffalo for the east," which passed through Montpelier (Montpelier OH *Leader-Enterprise* February 19, 1931).

WESTERN PACIFIC RAILROAD. Construction of the Western Pacific Railroad commenced in 1903 and was completed in 1909. It ran from the San Francisco Bay area via the Feather River Canyon to Salt Lake City UT.

In 1906 the Western Pacific concluded an agreement with the Japanese steamship company, Toyo Kisen Kaisha, to convey the ship company's goods by rail. The first transfers between ship and rail occurred early in 1911. The silk specials moved over the system at faster than passenger train speeds (J. Moore, Western Pacific's San Francisco Navy. Rail-Marine in San Francisco Bay, *Transfer* # 25, October-December 1998, pp 14-24. See also N.W. Holmes, *My Western Pacific Railroad. An Engineer's Journey*, Steel Rails West Publishing Co, Reno NV, 1996, p. 21).

Western Pacific silk trains continued east from Salt Lake City over the Denver and Rio Grande Western, Missouri Pacific, Wabash, and Delaware, Lackawanna and Western Railroads to the New York City area (G.H. Kneiss, *Fifty Candles for the Western Pacific*, Call up the title of the article on the internet in Google).

Western Pacific silk trains operated with seven or eight specially fitted out baggage cars plus a coach at the rear for the conductor, brakemen and guards. They normally ran with a 71 or 86 class 4-6-0 passenger locomotive. They were usually double headed in the third division of the Feather River Canyon and (perhaps) also over the Antelope Hill. Nothing was allowed to get in the way of these trains and even the *Scenic Limited* took the siding to let a silk train pass (Google Groups – bit.listserve.railroad – Silk Trains, Virgil Staff, October 28, 1997).

CHAPTER EIGHT

THE NEW YORK CITY AREA

By far the greatest number of silk mills in North America were located around New York City. One reason for this concentration was the presence banks and other financial institutions with experience in financing the shipment of goods from the Orient to the USA. Also, most of the wholesale firms which traded with the Orient, were located in New York City (T.S. Dayton, *Spinning Silk Across America*, Harper's Weekly, December 4, 1909 pp. 11-12).

There were 276 silk mills in the City itself, 259 in Paterson NJ and 301 in Pennsylvania for a total of 876 (in 1909) (Dayton, loc. cit.). A number of these mills were related to each other. For example, one company had a plant in Middletown NY, and others in Fort Royal and Covington VA, Altoona, Columbia, Wilkes-Barre, Blairsville and Holiday PA, and Union City, Hackensack and Bayonne NJ (Middletown Times Herald, December 13, 1927).

Many New York Central Railroad silk trains ended their journeys in Manhattan at the southern terminus of the "west side line." The silk was moved from the railroad yard to warehouses using horse drawn drays, and later, trucks. Other silk trains ended up in Weehawken NJ. Silk trains on other railways also ended up there, or in Hoboken NJ, and Jersey City NJ. Silk cars could be moved from the New Jersey yards, directly to warehouse unloading docks by rail. All the railways had facilities to barge trains across the Hudson River to Manhatten (e-mail, V. Polewski DATE)

While silk was moved across the country as quickly as possible, for reasons already explained, this frenetic activity ceased as soon as the silk was warehoused in the New York City area. This will become clear in the following paragraphs.

The silk was stored in the warehouses on skids in steel vaults. These were electrically alarmed, and humidity controlled buildings. To avoid having to store silk over a weekend it was desirable that silk trains arrive no later in a week than Thursdays. Storage over the weekend, increased storage, insurance, guard and other costs associated with time out from the market (Syracuse NY Herald, October 24, 1929).

The silk shipments were inspected by customs officials who released them to the consignee. (Many owners of the silk in transit borrowed money from a bank, trust company, or silk broker, and these financial institutions became the consignee). The bales were also inspected to ensure the coverings had not been pierced and that they were not damp or wet. Each bale was opened by representatives of a testing company. Three skeins were removed from different parts of the bale. The moisture content of these samples was determined, and adjusted to 11% to determine the weight of the bale for selling purposes. The bales were "conditioned" either by humidifying them or drying them. The silk was also put through typical yarn tests such as tenacity, elongation, tensile strength, etc. These steps took several days, but when they were completed the bales were

shipped to their owner within 48 hours. (T.S. Dayton, loc. cit.; *Run of the Silk Special*, Anaconda MT Standard, January 20, 1910).

Since the Japanese had developed a reputation for consistent quality, meeting defined specifications, it was the practice to test only one sample in each shipment. The Chinese had not established a reputation for consistent quality so all their shipments were normally tested. (Dayton, loc. cit).

In 1915, apparently only 10% of Japanese silk was thoroughly tested in the U.S. Further, while the test results were seemingly complete, they were often meaningless to the manufacturer. Since most manufacturers did not have their own laboratories, and did not know what specifications were required for their processes. Hence, they were helpless in demanding meaningful specifications from importers when purchasing raw silk. Actually, there was lots of time in the system to undertake tests as the average time between arrival of a bale of silk and its delivery to a throwster was 15 days (*Tests Needed for Japanese Silk*, New York Times, June 27, 1915, p. S8).

The individual mills bought raw silk at silk auctions, until the National Raw Silk Exchange was created in 1927. This exchange was merged with the New York Commodity Exchange in 1932. After purchase of the silk by the mills, often with the help of a bank or broker's loan, it was transported to their site. In the early years this was by dray or rail. The rail shipments varied in volume from less than carload lots to one or more car loads. Later, trucks were employed. The distances involved varied from a few hundred yards, to 200 or more miles (Railway and Shipping World, March 1904).

As noted in Chapter One several steps were required to convert the raw silk to a finished commercial product. Some large firms undertook all steps themselves, either in one big plant or in several specialized ones. However, there were many small plants in operation, which specialized in only one step of the manufacturing process. It was not unknown, for the silk in one bale, to be transported up to five times between the raw silk warehouse and the ultimate retailer. The baled silk at this stage contained 11% water, and around 25% sericin. It was relatively stiff, had no luster and was rough to the feel. The following steps were performed to remove these deleterious properties, and to prepare the silk for knitting and weaving.

The silk was removed from the bales, and soaked in a warm aqueous, mildly alkaline, emulsion of olive (or other vegetable) oil. The sericin was absorbed by the oil and the silk became soft and much more pliable. The hanks of silk were then dried and wound on bobbins. The next stage was known as "throwing," whereby the silk was wound on another bobbin so that a twist was imparted to it (from three to twelve turns per inch). Depending on the end use, two or more filaments were twisted together, and the degree of twist depended on the final use to which the fibre was to be put. Before dyeing, the continuous filaments were degummed, i.e., the remaining sericin was removed, by boiling in soapy water, and made up into skeins.

The skeins were then wrung out and dried. The next step was winding where the thread ended up on spools. From there the silk was made into skeins again, and sent to the dye house. From the dye house, the silk was sent to weaving or knitting factories, to be made into articles for retail

sale. It was in these factories that the quality of silk became important. Poorer quality silk threads were more likely to break in the processing machinery, thereby slowing production.

Silk thread of good to high quality was knitted into hosiery. This was high net return business, at which the Americans were superb. They had developed the machinery to do this in Paterson NJ from the mid-nineteenth century on. The vast majority of Japanese silk went into this end-use. Silk was also made into ready-made garments, fancy goods, jersey goods, ties, dress and lingerie fabrics, sewing and embroidery yarns, as insulating material in electrical tapes, and in parachutes.

Any lower quality Japanese silk and almost all Chinese silk was woven into fabric, and retailed directly to the public or sold to clothing manufacturers (Webber, loc. cit.). About 60% of the silk produced was useless for preparing goods requiring single filament yarns. However, these shorter lengths could be spun, much as was done with wool and cotton. These fibres were obtained from the unwindable fibres on the exterior of the cocoon, (the initial and final cocoon material was of varying diameter), and cocoons from which moths have hatched, for example. These fibres were degummed, combed to remove entanglements, and cut into short lengths (i.e., made into staple fibre), and then spun.

After degumming, the continuous filament fibre and spun fibre could be dyed. Silk may be dyed using a variety of dyestuffs, which often result in bright intense colours. A final treatment, called "scrooping," involved a wash with a dilute solution of aqueous tartaric or citric acid. This operation restored silk's unique characteristics of luster, feel, rustle, and scrunching sound when squeezed. The resulting products could then be made up into articles for retail sale.

The movement of silk between mills in the New York City area is described in Appendix Seven.

END NOTES

1. *Silk*, http://www.tis-gdv.de/tis_e/ware/fasern/seide/seide.htm
2. *The Silk Industry in Scranton*, excerpt from the Scranton Times December8,1891, p. 8 as recorded in http://www.rootsweb.com/~palackaw/news/silk.html.
3. A. Chadwick, *Silk*, Weaver's Journal, vol. III, #1, issue 9, July 1978, pp. 6-12..

CHAPTER NINE

THEFTS, ACCIDENTS AND OTHER EVENTS

THEFTS

THEFTS ON WATER

There were several reports of thefts on Erie Railroad barges crossing the Hudson River, in both directions, between Jersey City and New York City. For nearly a year in 1895, losses were estimated to exceed $15,000. The crew of the Company tug *Buffalo,* and the barge which it towed, were eventually arrested. Four men were arraigned (New York Times, April 20, 1895).

In mid-1922 river and coastal pirates in China became so active that silk shipments from the interior essentially ceased. However, when the silk junks were escorted by foreign gunboats pilfering was substantially reduced. In a report from Canton, dated July 26 1922, a British gunboat escorted a fleet of junks from Takhing in Kwangtung Province to Hong Kong. Their combined cargoes were worth $2 million (New York Times, *Pirates Stop Silk Trade*, July 27, 1922).

There was apparently a theft of silk from the silk room of a Canadian Pacific Steamship Company vessel. Three bales of silk, belonging to F.A. Strauss Inc., of New York City, were stolen on a passage in 1930. On January 3, 1931, the Court of Appeal of New York State found the steamship company liable for this loss. The court decision ignored the terms of the freight contract entered into by Strauss with the steamship company which absolved the company of any theft which might occur (Vancouver Province, Marine Notes, ,January 4, 1931).

THEFTS FROM TRANSCONTINENTAL TRAINS

Robbing a silk train was difficult and required meticulous planning. Several conditions had to be met to result in a successful theft:

(1).The thieves had to know when a silk train was expected. At most there might be two or three per week, and often only one per month or less, on any given railway. They did not run on a schedule.
(2) The thieves had to choose a location where the trains ran slowly. The most favoured spots were as a train was leaving a yard, on a heavy grade, or near water stops.
(3) There had to be a road alongside the railway tracks at about the same elevation as the tracks.
(4) There had to be silk mills nearby where the stolen silk could be sold (for a general article see *Railway Car Robberies Carefully Planned*, New York Times, September 28. 1924, p. X 15; *Guarding the Cars,* Sheboygan WI Press, November 3, 1909).

While silk trains were stopped for a few minutes at crew change points, there were so many railway personnel and armed guards around that theft at that point usually wasn't feasible.

It was also not often feasible to hide in a railway car on a silk train due to the manner in which the cars were packed and inspected.

Mr. Ramsay Peugnet, Secretary of the *Missing Property Bureau* of the Silk Association of America, gave his annual report in March 1920. He advised that a new form of silk thefts had appeared – operations against transcontinental trains. In one instance 18 bales of raw silk were stolen, of which 11 were recovered as a result of work by the *Bureau*.

There was a steady market for stolen raw and broad silk in the New York area in the 1920's. The thieves sold the stolen silk to fences, who in turn sold raw silk to manufacturers, and broad silk to retailers From January 1 to September 1, 1923, $450,000 worth of raw silk was stolen in the New York area, and $150,000 worth of broad silk. Raw silk could only be identified by the manifest numbers and chop marks on the bales. Once silk was removed from a bale it could not be identified by the technology then available. When raw silk was worth $10 per pound, it could often be bootlegged for $8, and some small mills were only too eager to buy it (*Frequent Theft sof Silk Material*, New York Times, September 9, 1923, page E12).

No records were found of silk train thefts from Canadian railways or from US railroads west of Chicago IL, Kansas City KC, or St. Louis MO. Most silk train thefts took place near New York City, because of the many silk mills in the area. This made it easier for "fences" to dispose of the stolen silk.

One technique used by thieves to board a moving train, was by throwing a rope, with a hook on the end, over the top of a railway car. The hook would catch on something on the far side of the car and the thief would haul himself up, and break the car door seal, He would then throw the silk bales out the open car door, which would be picked up by confederates stationed along the right of way. The bales were then loaded into waiting trucks and delivered to a storage place. There the books of silk were removed from the bales, and delivered to the fence. This technique had been used in Chicago, IL St. Louis MO, and Kansas City KC (New York Times Feb 8, 1920). (Unfortunately, no further information was found on these robberies).

In 1919 about $45 million worth of goods were looted while in transit on US railroads. Raw silk was the most favoured plunder. The railroads claimed that their loss of raw silk was nearly equivalent to their profit on transporting it. The United States Railroad Administration was considering an embargo on the transportation of silk. Incidentally, very roughly, a bale of silk was worth a workman's annual wage (New York Times, February 8, 1920, March 25, 1920).

One group appears to have made a number of thefts from several New York Central Railroad. trains, all of which had originated in Vancouver. These were:

(1) January 21, 1920, 32 bales of raw silk valued at $65,000 stolen from a car in transit to William Guerin & Co, NY;

(2) January 27, 1920, 71 bales of raw silk valued at $120,000 stolen from a car in transit to Mitsui & Co. NY;
(3) February 13, 1920, 83 bales of raw silk, valued at $198,000, stolen from a car in transit to Shibakama Co., NY; and,
(4) April 8, 1920, 121 bales of raw silk, valued at $218,000 in transit to E. Gerli, NY

Forty-eight persons were charged with these thefts in June 1920. They included five employees of the New York Central Railroad (New York Times, June 8, 1920).

Five men, including four railroad employees were arrested and charged with stealing silk from New York Central trains in transit, near White Plains, NY. One of them had learned how to remove seals from freight car doors, and replace them so that it was difficult to see that they had been broken (New York Times, September 25, 1921).

Another theft on a transcontinental silk train apparently took place near Poughkeepsie, NY, in 1922 (Chicago Daily Tribune, April 3, 1922, page 1).

In the six years leading up to 1922, $10 million worth of goods were looted from the New York Central Railroad. In the earlier years silk was the favoured loot, although by 1922, liquor thefts were more common. Thirty-four railroad employees were arrested. Goods were thrown from moving trains at night or stolen from cars in railway yards (*Rum Running Connected with Central Thefts*, Syracuse NY Herald, March 17, 1922).

One unconfirmed report of a silk train robbery took place in the US near the New York/Ontario border. A gang successfully stole some bales of silk from a train. Guards shot several of the gang members including one Peter Stark. Stark was wounded in the arm, but successfully hid in a straw stack for several days. He subsisted on fresh chicken eggs which he stole at night. Eventually, gangrene set in and he had to have his arm amputated. Apparently the gang was able to get the silk across the border into Canada and disposed of it there. Stark was never caught. In later life he operated a chicken farm in the Saskatoon area. (E. Gossner, *Keeping Fashion on Track*, Western People, June 24, 1993, p.8. Gossner currently (2008) lives in North Battleford and was able to add a little to the Western People article).

The question of supplementing guards on silk trains arose at the International Raw Silk Conference meeting held in New York City in October 1929. It was stated that silk trains from Vancouver and Seattle were each carrying around 25 guards, armed with machine guns. It was suggested that silk be placed in armoured vaults in each car to reduce the need for guards. It does not appear that the suggestion was acted upon (*Flying Forts May Supplement Silk Guards*, Syracuse NY Herald, October 24, 1929).

ACCIDENTS

Given the relatively high speed of silk trains, there were remarkably few accidents. Undoubtedly, the fact that rolling stock and tracks were carefully inspected played a major role.

<u>Atchison, Topeka and Santa Fe Railroad.</u>

In an undated report, obviously from the early days of silk transport, an Atchison Topeka and Santa Fe train derailed in California. It was carrying silk, tea, honey, wine and Alaska seal skins. This happened to be the most valuable cargo carried on the railway up to that time. One car derailed at the foot of a steep hill in the Mojave Desert and caught fire, threatening the entire train. The crew put out the fire by drowning it in wine and smothering it with raw silk! (E. Paterson, loc. cit).

Baltimore and Ohio Railway.

On November 3, 1928 a Baltimore and Ohio silk train rear-ended a Chicago, Rock Island and Pacific (CRI&P) transfer freight train. The accident occurred on the CR&IP South Chicago Line (Chicago Terminal Division, sub-division 1A) near Woodlawn Avenue at 02:22 in drizzling rain. The track was owned by the CR&IP while ten railroads had interchange rights on this section. The CR&IP freight was stopped behind a second CR&IP transfer train which in turn was held up by a blocked crossing. The CR&IP transfer train was presumably protected by colour light signal #124 which was inoperative.

The B&O silk train was pulled by locomotive 5231, and consisted of four express cars laden with raw silk and a coach being used as a caboose. It left Western Avenue Chicago at 01:52, classed as a passenger train extra, and was due in Garrett IN in three hours ten minutes (a passenger train schedule), a distance of about 150 miles. Although the B&O crew was familiar with the South Chicago Line they completely missed the non-functioning signal 124 and hit the stationary fright transfer train at approximately 40 mph. Three railroad employees were killed (United States Interstate Commerce Commission Railroad Accident Reports digitized on the internet.) (Note. # 5231 was a Baldwin built 4-6-2 built in the early 1920's for fast passenger train service. See G.H. Drury, "Guide to North American Steam Locomotives, Kalmbach, Waukesha, WI 1993, ISBN 0890242062).

Canadian National Railways.

In 1928 the CNR lost several carloads of raw silk in the Fraser River Valley. A special freight train carried the spilled bales to Edmonton. CNR employees worked most of Christmas Day transferring the bales from freight cars to passenger rolling stock so they could be sent east on a passenger express. Jim Munsey, of the Edmonton Morse Telegraphers club, remembers his father being called out to help make the transfer (*Silk Specials: The Silk Trains*, Chapter 7 in "Jasper: A Backward Glance at People, Places and Progress. P. MacAdam, "Iron Horses on the Silk Road," Ottawa Sun, May 13, 2001; J. Munsey, personal communication, 2006).

> NOTE: The material in the Jasper and MacAdam publications was originally assembled by the late J-G Coté. Coté believed that the written records of this accident had been destroyed by the CNR. The transfer in Edmonton took place in the original GTPR downtown yard located between 104 and 105 Avenues and 96 and 97 Streets. Seemingly, the only confirmatory evidence available on this incident is Munsey's recollection).

Canadian Pacific Railway

On the earliest silk trains the tail-end crews and guards were housed in a caboose, as was the norm for freight trains. However, when a silk train was rounding a curve in the Laggan sub-division west of Calgary at high speed, the caboose was flung off the tracks taking several silk-laden cars with it. Thereafter, silk train crews were housed in a passenger car at the rear of the train, as became typical practice on all silk trains in North America (Wm. Donlevy, *Retired Railvets News,* 1984)

On January 13, 1909, a silk train broke in two and was run into by a way freight train. Three railway employees were killed and several cars of raw silk were demolished. The accident took place near Tompkins SK, west of Gull Lake, SK. The inquest was held at Maple Creek SK, where the testimony of the surviving employees was conflicting. The silk train engineer and conductor later fled the Province, and the engineer repudiated his verbal testimony in a letter to the coroner. The material gleaned from the inquest was turned over to the Provincial Attorney General's Department (Information obtained from material at the Stockman's Museum, Cochrane AB, Folklore, spring 2001, Vol. 22, #2, pp 16-17. The Saskatchewan Attorney General's Department and the CPR Archives had no further information on this event. Swift Current Sun, January 15, 22 and 29, 1909).

On September 21, 1927, a CPR silk train derailed east of Yale BC near mile 27 on the Cascade subdivision. The fifth car from the engine left the track followed by three others, which together contained 4,520 parcels of raw silk. One car sank and was never recovered. Another broke open and spilled bales of silk into the Fraser River. The railway offered a reward of $10.00 (some references say, $5.00) for every bale of silk returned to it. Citizens lined each side of the Fraser River with fishing rods and sturgeon hooks, "bobbing" for the 4,000 packets estimated to be floating down the river. It took 100 men three days to clear the wreck. The damaged cars were scrapped. They may all have been amongst the special silk cars owned by the CPR, since four of them had disappeared from the CPR car roster by 1929 (Chambers Fonds, loc. cit.; Hubbard, loc. cit.; Kamloops Sentinel, September 30, 1927, p. 1; Barone, loc. cit.; www.user.dccnet.com/s.brown/biographics/tjbrown_jebrowne.html; Lamont, loc. cit.).

About eight pounds of the silk floating down the River, came into the possession of a lady who lived downstream of the accident site. She used it to stuff a comforter. Years later the comforter changed hands and the new owner realized where the batting had come from. She sold it to a Vancouver Weaving Guild member who divided it up and sold it to other members. Some of them had the batting spun and turned into mementos of its fascinating past. Presumably some silk artifacts around Vancouver still exist which were made from the purloined silk fibre! (anon, *The Silk Trains,* Guild of Canadian Weaver's Newsletter, vol. 31, #3, September 1988).

The United States Testing Company was given the contract for salvaging the damaged silk, and restoring it to commercial quality. While it could probably never be used to manufacture hosiery, it could be converted to staple fibre, and woven, for later conversion to saleable products. Most of the recovered bales were soaked with water, and some were contaminated with mud. Some of the wet bales weighed as much as 400 pounds, versus the normal weight of 133 pounds. The bales were kept wet until they reached the Company's facility in Hoboken, NJ where the

contents were washed and conditioned, i.e., carefully dried to 11% moisture content. The Company recovered about 2,000 bales (Jameson fonds, loc. cit.).

The charming children's story "Emma and the Silk Train," is based on this event (J. Lawson, *Emma and the Silk Train,* Kids Can Press, Toronto, 1998. ISBN 1440746510).

Milwaukee Railroad

Somewhere in the Dakotas, a silk train was being operated as the second section of the fast passenger express "The Columbian." The silk train ran into the rear of the first section due to a foul-up in the signals for the second section ("jimsands2" February 25, 2004 in trainorders.com/discussion/read.php/11,691278,691817#msg-691817).

New York Central Railroad.

An 11 car silk train, pulled by a New York Central Railroad camelback locomotive, collided with the rear of the Montreal Express, on December 31, 1909. The Express was stopped due to a stalled freight train. One person in the stalled express was killed, while the silk train crew survived (New York Sun, January 1, 1910, p.1).

The coroner, investigating the accident, found the engineer of the silk train to be guilty of culpable .negligence. He was bound over to await the decision of a Grand Jury in White Plains on a charge of manslaughter in the second degree (*Mr. Trask's Death Laid to Engineer*, New York Times, January 29, 1910, p. 6).

On November 15, 1924 a silk train was involved in an accident between Sterlingsville and Carthage NY. A water bar in NYCRR locomotive 2178 burst. The fireman was ejected from the cab and landed in the ditch. The engineer although badly scalded managed to stop the train. A fresh locomotive arrived from Carthage in a few minutes and the train was underway to New York City via Utica. The baled silk was from Japan and arrived in Ogdensburg (NY) via ferry from Prescott ON. Watertown Daily Times November 14, 1924 *Two Scalded in Cab of Engine*. <tinyurl.com/d5urks>.

Pennsylvania Railroad.

On October 16, 1929, there was a wreck on a Pennsylvania Railroad train running through Irvington IN. An engine and 11 cars derailed, as a result of a 50 feet section of track having been loosened. The train was carrying silk and whiskey, and it was thought that someone was trying to commit a robbery. No one was ever caught (L. Muncie, *Irvington Stories,* 1992, Irvington Historical Society, reported on Google).

Wabash Railroad Near Accident

Late in 1929 a Wabash silk train on the Canadian Division (between Detroit and Buffalo) narrowly escaped a derailment. A short time after the silk train passed by, a freight train running over the same track was derailed as a result of a broken rail. Utica (NY) Observer November 28,

1929 *Fast Silk Train Narrowly Escapes Disaster on the Wabash*, www.fultonhistory.com/Fulton, htm.

FIRES

Canadian Pacific Railway.

In mid-September 1892 there was a fire in car # 4282 causing it to be held in Winnipeg. The silk in it had been landed from the *Empress of India*. Car numbers 57182, 25916, and 13294, presumably containing silk, were held over one day. A few days later, Mr. G. Olds, the CPR General Traffic Manager, wrote Vice-President Shaughnessy concerning the fire and pointed out the brisk competition the CPR was experiencing in its silk traffic from US railroads operating out of San Francisco. The CPR hadn't obtained much silk business in the first half of 1892, although several large consignments had been received since (CPR Archives via Webber, loc. cit.).

U.S. Silk Train.

It was reported in 1910 that "recently a silk train derailed in the western U.S. and caught fire." The insurance company had to pay out over $1 million to cover the loss (Anaconda MT Standard, January 20, 1910).

SOME INTERESTING EVENTS

Potential Loss of a Bridge.

At Harper's Ferry WV, there was danger that the flooding Potomac River would wash out a Baltimore and Ohio Railway bridge. The Railway President, Mr. J.W. Garrett, arrived on the scene, and ordered that a loaded freight train waiting nearby, be run onto the bridge. The local superintendent pointed out that the box cars contained raw silk. Garrett responded that it would be easier to pay for the silk than to rebuild the bridge. The train was thereupon run onto the bridge, and presumably its weight saved the bridge from being washed away. The silk was en route to New York City from China and Japan, via San Francisco (Amador CA Ledger, August 17, 1900, reprinted from the Birmingham AL Age-Herald. Note that Garrett died in 1884, while still President of the B&O).

Trains Marooned in a Snow Drift.

In February 1910, two Milwaukee silk trains were stalled in snow drifts west of the Taft Tunnel, in Shoshone County Idaho, near the border with Montana. The first train was loaded at Tacoma on February 22 and the second one the next day. The value of the silk on each train was $1 million. The railway was sufficiently concerned thieves would steal the silk, that they hired special agents, including some from the GNR, to go to the site. With the help of a number of local citizens the trains were dug out, and sent on their way. There was no report of any attempt at thievery. (Washington DC Times – datelined Wallace, Idaho – March 11, 1910; La Crosse (WI) Tribune, March 7, 1910).

Around the World in Forty Days.

In August 1911, Andre Jaeger-Schmidt, a newspaperman with the Paris (France) Daily Excelsior achieved his goal of circling the globe in less than forty days. It actually took him 39 days, 19 hours and 43 minutes with the help of a CPR silk train

Schmidt landed at Vancouver from the CPR liner *Empress of Japan*, which, as a result of some financial inducements from Schmidt, reached Vancouver from Yokohama 14 hours ahead of schedule at 22:00 Sunday August 13, 1911. He promptly boarded an eight car CPR silk train, which reached Prescott ON in four days. Schmidt had earlier left the train at Smith Falls ON to catch a steamship at Montreal.

The train was rapidly moved onto the Prescott-Ogdensburg ferry. It was pulled off the ferry in Ogdensburg by a fresh New York Central locomotive. The cars were checked and opened in Ogdensburg by US Customs and samples of raw silk removed for inspection. The train was then made ready and proceeded to New York City where it arrived 18 hours later. (Million Dollar Silk Train Was Rushed Through to New York City," Ogdensburg News, Friday August 18, 1911 : New York Times, August 27, 1911).

CPR Train Chained to Tracks.

Webber (loc. cit.) recounted the tale of a CPR silk train being chained to the tracks in Fort William ON until the Railway paid taxes demanded by the civic administration. The Fort William City Archives has no record of this event. But they do have a record of a CPR switch engine being chained to the tracks until the Railway paid some taxes the Town thought was due. Presumably the event was dramatized by someone to involve a silk train rather than a prosaic switch engine (T. Tronrud, Curator, Thunder Bay Museum, by e-mail to the author 2006-01-05. Note that the cities of Fort William and Port Arthur were combined into Thunder Bay in 1970).

Overtaking the Prince.

In late 1926, Prince George, later Duke of Kent, was serving on H.M.S. *Hawkins*, Flagship of the China Station. He sailed for home on the *Empress of Russia*, leaving Hong Kong on November 11, with the intent of spending Christmas with his family in Great Britain. The *Empress* docked at Pier "A" in Vancouver late on November 29, having been delayed a few hours by fog in the Strait of Juan de Fuca. The Prince planned to catch the CP liner *S.S. Mountroyal*, at Halifax, on December 7. The CPR made up a special train for him and the other passengers from the *Empress of Russia*. The ship had arrived at 23:00 and the train departed at 00:02 for the east.

The *Empress* also carried a load of silk. The first bale of raw silk was loaded on the silk train at 23:21, and the last bale at 03:23. The silk train departed Vancouver docks at 03:45. Before noon in the Rockies, the Prince's train went into a siding to let "the silk" by. "The silk" had right over all trains, hence royalty had to wait! In the event the Prince made it to the east coast on time and was able to spend Christmas with his family (Canadian Pacific Passenger Department Bulletin

December 1926, courtesy CPR Archives; e-mail from CPR Archives, October 29, 2007; Chamber's fonds, loc. cit.; Hubbard, loc. cit.; Vancouver Province, November 30, 1926, p. 1). NOTE: The location in the Rockies where the two trains passed has not been determined. But it should be noted that the passenger train, even when making up time, accomplished in ca. 12 hours, what the silk train did in eight and a half hours!).

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CHAPTER TEN

THE DEMISE OF SILK TRAINS

EXAMPLE OF A SILK OWNER'S TRANSPORTATION COSTS.

In the 1920's, on a shipment of 126,000 pounds, a shipper would pay a shipping company $3.00 per hundred pounds of baled raw silk, for transport between the Orient and the west coast of North America (*Handling Silk*, loc. cit.)

The railway companies charged $9.00 per hundred pounds for transporting the silk from west coast ports to the New York City area. The tariff was collected by the railway at port side. It was divided up between the various railways involved, based on mileage (*Handling Silk*, loc. cit.). For example, for shipments over the Canadian Pacific, connecting with the New York Central, the Canadian Pacific's share was $7.85 and the New York Central's share was $1.15 (P. MacAdam, *Iron Horses on the Silk Road*, Ottawa Sun, May 13, 2001).

Thus the total transportation cost to the shipper was $15,120. Added to this was interest on the $585,000 invested in the silk for the 13 days required for the transport, or $1,250. The insurance was $643, bringing the total cost to the shipper from the Orient to New York City to $17,013. These charges amounted to 13.5 cents per pound of silk (*Handling Silk*, loc. cit.).

The shipping cost by sea from the Orient, via the Panama Canal to New York City was $6.00 per hundred pounds. The interest for the 20 days it took to ship by sea was $1,924, and the insurance was $2,164, for a total of $11,648, or 9.2 cents per pound (*Handling Silk*, loc. cit.).

When silk commanded a price of $7.50 per pound, the transportation cost by sea and rail was 1.8% of the total. But when the price of raw silk was $1.50 per pound the sea-rail transportation cost was 9.0%. Hence the shipper wanted the lowest possible transportation cost, and time was no longer of the essence (*Handling Silk*, loc. cit.).

INCREASED COMPETITION FROM THE ALL-WATER ROUTE.

In 1928, over 522,000 bales of raw silk were transported by all railways across North America. By 1932, the volume of rail shipments had declined to ca. 221,000 bales. However, the total imports of raw silk to North America varied from 637,000 bales to 533,000 bales over this period. The difference was made up by a steadily increasing proportion being delivered by ship directly from Japan, via the Panama Canal (see for example "Scrutator" *Railways Seek Lost Business*, Chicago Daily Tribune, October 18, 1931; Webber, loc.cit.).

Two changes had taken place. One was the increasing competition from Japanese vessels in moving silk directly from the Orient to New York City via the Panama Canal, thereby by-passing west coast ports.. The other was the very significant decline in the value of raw silk – from an average

price $5.11 per pound in 1929 to $1.27 per pound in 1934. This was largely due to the stock market crash in 1929, which resulted in significant declines in income for retail customers of high quality silk products.

In 1931 the tariff for transporting silk by rail from the Pacific Coast to New York City was $9.00 per hundred pounds. In December of that year the rate was reduced to $6.00. In March 1934 the rate was further reduced to $4.00. The total transportation cost from Japan to New York City by ocean plus rail was now $7.00. The all-Ocean route via the Panama Canal was $6.00 (Railway Age, Vol. 96, March 31, 1934, p. 478). Unfortunately, with the by now relatively low price of raw silk, this inducement was insufficient, for the railways to recover the silk transportation business.

By 1932 the Japanese found themselves with a surplus of 108,000 bales of silk. This was overhanging the market for silk and consequently could force a further downward spiral of silk prices. E. Gerli and Son of New York, bought the surplus for $150 per bale, versus the open market price of $178 on the *National Raw Silk Exchange*. Gerli expected to sell the poorer grades in the Orient, and the better grades in Europe and the USA. The Japanese Government simultaneously tried to stabilize the silk market by urging smaller production. The Gerli Company, incidentally, was the largest silk commission merchant in New York. Gerli had also stepped into the Japanese silk market, and stabilized it, after the big earthquake in 1923 caused deliveries to stop for two months (*Seven Thousand Tons of Silk*, Time Magazine, May 9, 1932).

By 1935 the amount of raw silk entering west coast ports was now so limited that silk trains were no longer practicable – five cars being a minimum for a train. In January 1935, for example, only four carloads of silk were landed at Seattle, and two at Vancouver. Consequently, the silk was being moved as head-end traffic on passenger express trains. Most of this silk went to Chicago, Indianapolis and Montreal. New York destined silk went by ship through the Panama Canal (REF).

The following clearly demonstrates the decline in silk shipments as experienced by the Canadian National Railways. The table shows the weight of raw silk moved in head-end cars on passenger trains in the year indicated:

1936	2.35 million pounds
1937	2.84
1938	2.31
1939	0.95
1940	0.09

The much lower amounts moved in 1939 and 1940 were due to war conditions, and low tariffs, which encouraged the movement of raw silk by freight trains, rather than passenger trains (National Archives of Canada, RG 30, CNR Records, via Webber, loc. cit.).

Finally, with the outbreak of War in the Pacific, late in 1941, silk shipments to North America ceased totally.

COMPETITION FROM OTHER FIBRES

Some authors have stated that the demise of silk was caused by the introduction of synthetic and semi-synthetic fibres. As described below, the introduction of these fibres was not a factor in the demise of silk trains.

The first artificial fibre was viscose rayon, sometimes known as "artificial silk." It was commercialized in Britain in 1905, and in the USA, five years later. Although rayon was widely used in ladies stockings, its properties did not enable it to compete with silk, at the high end of the hosiery and fabric markets. While widely used in the 1920's and '30's it did not impact significantly on the market for silk (Wikipedia).

Cellulose acetate, often called "acetate" was first commercialized in the US in 1924, and was also used in hosiery, as well as fabric. Again, its properties were not competitive with silk, and stockings made from it were never as popular as "rayons." (Wikipedia).

Nylon fibre was introduced in 1940, and was an immediate hit as a hosiery material. By this time silk trains had not been operated for about five years. Further, there was a great demand for nylon for war purposes, and it was not until after the 1939-1945 war that nylon overtook rayon and silk as hosiery material. (Wikipedia).

Thus silk trains operated until the mid-nineteen thirties. Afterwards some silk was moved in individual head-end cars attached to express passenger trains. All movements of silk from the Orient ceased around September 1941. After the Second World War farmers in the Orient resumed exporting raw silk. But it now went either by ship, directly to the New York City area, or was flown there by air freight. Given the relatively low cost of competing synthetic fibres, especially nylon, silk never again, after the nineteen-twenties, commanded the relatively high prices it did then.

END NOTE
Webber, loc.cit.

Draft 6, 2008-10-30

APPENDICES

APPENDIX ONE.

SHIPMENTS OF SILK WORM EGGS

In the 1870's there was apparently a market in France, and perhaps elsewhere in Europe, for silkworm eggs. These had been shipped from the Orient via the Suez Canal (from 1869). However, due to the long voyages and sometimes high heat, many of the eggs died in transit. Consequently, Oriental shippers experimented with the faster "land bridge" across North America.

One shipment of silk worm eggs occurred late in 1875. Three carloads, worth $6 million, were delivered to New York City from San Francisco. They were shipped from Hong Kong and took 23 days to arrive at the west coast. The train trip across the US took seven days via the Central Pacific, Union Pacific, Chicago, Burlington and Quincy, Michigan Central, Great Western (of Canada), and New York Central. It was hoped that the land bridge route across North America, versus the hotter slow route across the Indian Ocean and the Suez Canal would deliver the eggs faster to European customers and with less damage en route (New York Times, December 16, 1875).

Another shipment of silk worm eggs was reported in December 1879. Six carloads, valued at $850,000 were received over the Pennsylvania Railroad in New York City, from the west coast. It was loaded aboard the S.S *Havre the Amerique* for shipment to France and Italy. The eggs were grown near Yokohama and were packed in containers measuring three feet by one foot by less than one foot high. Each case, which was very carefully packed, contained about 600,000 eggs. The containers had to be kept dry and cool, which precluded shipping during the summer months (New York Times, December 21, 1879).

No other reports of shipments of silk worm eggs were found.

APPENDIX TWO

SILK TRAIN MYTHS

It seems likely that most persons writing about silk trains, put pen to paper, because of their fascination with speed. Consequently, they sought an explanation as to why the railways went to such extraordinary lengths, to move their silk cargoes to the New York City area as quickly as possible. Unfortunately, many of them came up with the wrong answers. The most common ones were that silk worm cocoons were being transported, and that raw silk deteriorates fairly rapidly. These myths will be dealt with in turn.

The silk train literature often stated that the bales being transported, were filled with silk worm cocoons. If so, it was argued, that the cocoons had to be delivered to silk mills before the cocoons hatched, otherwise they would eat through the silk and destroy the long fibers. At first sight, this explanation seems reasonable, as the elapsed time from Japanese ports to New York City was often less than three weeks – which was just a little longer than the life-time of a cocoon.

However, this assumption ignores the time which would have been spent moving the cocoons from the farm to the port of embarkation, the time spent in the warehouse in New York City awaiting conditioning and testing, auctioning the silk, delivering it to the mill, and the time spent in inventory in the mill. This overall time would have been four to six weeks.

Some might argue that the cocoons could be kept cool during transport, and hence could be kept for considerably longer than six weeks prior to hatching. This was done on silk farms in the early years of silk transportation, by storing cocoons over winter. But by the 1920s, transporting silk was a year round activity. In the days before mechanical air-conditioning – as the 1920s were – travel of goods on land subjected them to considerable heat. On the railways, ice-refrigerated cars were available, and silk was moved in them, especially in the USA. But, in practice, "reefers" carrying silk were not cooled, because of the possibility of water leaking from the ice into the area containing the silk. Further, there was not sufficient time on the way to NewYork to re-ice them. Consequently the cooling capabilities of reefers were not used on silk trains. In fact, they were used in silk transport because they had high-speed wheel trucks permitting them to travel at passenger train speeds. Also, their interiors were free of sharp projections and easy to keep clean, and their doors were well sealed keeping out dirt and moisture.

Other writers have explained the need for speed because silk was claimed to deteriorate in transit from the Orient to the New York City area. However, the main use for silk is as a fabric, in hosiery and other articles of clothing. As such it is washed numerous times, and is subject to ambient and body temperatures, and perspiration. But when looked after properly it can last for years – as have the Chinese silk garments in the MacTaggert Collection at the University of Alberta, for example, some of which are well over a thousand years old.

The high speed of silk trains is completely explained by –

The high insurance rate incurred by the railway, and

The interest on the customs bonds required.

To a lesser extent, there was competition between railways for the lucrative business of transporting silk. The effect of this was to deliver the cargo to its destination as quickly as possible, in the condition in which it was received.

APPENDIX THREE

GREAT NORTHERN RAILROAD SILK TRAIN RUNS, 1925 (1)

Name of Steamer	Leave Seattle Docks	Great Northern Time to St. Paul	Time from Arrival to Departure for Chicago	CB&Q time to Chicago	Time consumed in Chicago for Delivery to Connection	Number of Cars
Toyooka Maru	January 4, 1925	51hr 18min	09min	10hr 04min	11min	8
Kaga Maru (1st Sect.)	January 15, 1925	52hr 26min	07min	9hr 51min	26min	6
Kaga Maru (2nd. Sect)	January 15, 1925	51hr 50min	09min	7hr 21min	45min	10
Toyama Maru	January 30, 1925	51hr 55min	11min	9hr 24min	26min	8
Iyo Maru	February 13, 1925	51hr 31min	16min	9hr 45min	56min	10
Hakats Maru	February 19, 1925	51hr 46min	14min	9hr 40min	26min	9
Shidzuoka Maru	March 3, 1925	51hr 20min	10min	9hr 30min	06min	8
Tokiwa Maru	March 15, 1925	50hr 13min	10min	9hr 44min	28min	6
Yokahama Maru	March 27, 1925	50hr 44min	04min	8hr 59min	27min	5
Toyooka Maru	April 8, 1925	52hr 18min	15min	9hr 03min	22min	5
Kaga Maru	April 13, 1925	51hr 10min	08min	9hr 00min	1hr 02min	6
Toyama Maru	April 22, 1925	51hr 25min	13min	10hr 09min	29min	10
Iyo Maru	May 1, 1925	52hr 02min	10min	9hr 28min	58min	10
Atago Maru	May 13, 1925	52hr 30min	20min	9hr 24min	41min	9
Shidzuoka Maru	May 21, 1925	51hr 06min	20min	9hr 03min	39min	5
Tokiwa Maru	June 5, 1925	52hr 15min	10min	9hr 48min	27min	8
Yokahama Maru	June 12, 1925	53hr 07min	18min	8hr 53min	17min	6
Asaka	June 23, 1925	50hr 12min	19min	9hr 56min	43min	9
Kaga Maru	July 1, 1925	51hr 50min	11min	10hr 25min	21min	11
Toyama Maru	July 17, 1925	49hr 18min	15min	10hr 36min	34min	14
Iyo Maru	July 24, 1925	49hr 53min	12min	9hr 50min	21min	6
Atago Maru	August 7, 1925	48hr 40min	30min	9hr 46min	33min	14
Shidzuoka Maru	August 13, 1925	49hr 05min	05min	9hr 42min	43min	5
Pres. Madison	August 21, 1925	50hr 32min	08min	10hr 12min	1hr 25min	12
Tokiwa Maru	August 22, 1995	49hr 25min	16min	9hr 53min	39min	14
Yokahama Maru	September 6, 1925	50hr 06min	18min	9hr 57min	10min	12
Asuka Maru	September 14, 1925	49hr 50min	10min	9hr 38min	32min	8
Kaga Maru	September 25, 1925	52hr 35min	15min	10hr 03min	47min	18
Toyama Maru	October 8, 1925	49hr 25min	10min	9hr 42min	30min	9
Iyo Maru	October 17, 1925	48hr 35	15min	10hr 00min	48min	11
Atago Maru	October 23, 1925	48hr 55min	10min	9hr 18min	10min	7
Shidzuoka Maru	November 1, 1925	49hr 30min	10min	9hr 30min	12min	7
Tokiwa Maru (1st Sect.)	November 15, 1925	50hr 41min	1hr 19min	9hr 50min	45min	14
Tokiwa Maru (2nd Sect)	November 15, 1925	—	5hr 29min	10hr 09min	18min	—
Yokahama Maru	November 26, 1925	49hr 02min	14min	10hr 51min	03min	12
Asuka Maru	December 14, 1925	47hr 30min	15min	11hr 02min	43min	11
Kaga Maru	December 20, 1925	46hr 40min	10min	9hr 19min	48min	7
Toyama Maru (1st.Sect)	December 31, 1925	45hr 42min	14min	9hr 46min	38min	11
(2nd Sect)	December 31, 1925	45hr 34min	09min	9hr 57min	48min	12
Pres. Jackson (1st Sect)	December 31, 1925	45hr 09min	14min	9hr 44min	1hr 06min	10
(2nd Sect)	December 31, 1925	44hr 31min	14min	9hr 41min	1hr 02min	6

(1) W.B. Jones, *Silk Trains – A Record of Achievement*, The Cascadian, April 1961, pp. 20-24.

APPENDIX FOUR

SILK SHIPMENTS DIRECT TO NEW YORK CITY

From the mid-1850's, until 1940, raw silk was imported into the United States through ports on the north-eastern seaboard. Before the era of the silk trains it was routed to the USA directly from the Orient via the Cape of Good Hope (around Africa) or Cape Horn (around South America). Some ships landed cargos on the west side of the Isthmus of Panama, which were then taken across to the Gulf of Mexico side and reloaded onto other ships there. After 1855 a railroad was available to ease the land portion of the journey. Following the opening of the Suez Canal in 1869, the Cape of Good Hope routing was largely abandoned.

Even after the opening of the transcontinental railroads in North America, silk continued to be imported directly into the New York area, by sea. See for example, Tables Three and Five in Chapter Three. During the nineteenth century and into the early twentieth century, Italian silk was of relatively high quality, and formed a significant portion of the raw silk imported along the eastern seaboard. However, the quality of Japanese silk advanced rapidly and was soon superior to the Italian variety.

In February 1875, $2.55 million of silk goods was received at the Port of New York. Of this (by value), 55.3 % was raw silk, 11.3% was ribbons, 10.5% was silk and cotton, 8.2% was lace, 6.0% was braids and braiding, and the remainder consisted of small amounts of satins, crepes, plushes, velvets, shawls, gloves, cravats, handkerchiefs, hosiery, sewings and worsted. During this period, 633 bales and cases of raw silk were received – 61.3% via the Isthmus of Panama, and 27.8% via Europe (New York Times March 1, 1875). Presumably the remaining 10.9% came across the "land route" by rail.

In April 1912, the British liner, RMS Titanic, sank. Her silk cargo amounted to eight bales of raw silk, three cases of silk crepe, nine cases of silk goods and two cases of silk (of unspecified type). It was all consigned to New York City (Google – *The RMS Titanic – Cargo Manifest*). It seems probable, that a number of ships sailing to New York City or the New Jersey shore carried similarly modest amounts of raw silk and silk goods.

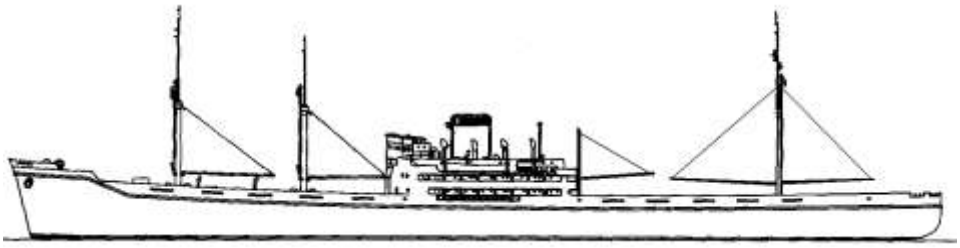
Even at the beginning of the silk industry in Japan, the Government played a significant role. This role increased rapidly in the 1920's, as outlined in the text. Apart from greatly assisting in improving the quality of Japanese silk, the Government also played a major role in getting Japanese steamship lines, to carry raw silk to the United States via the Panama Canal.

In 1928, Japanese ship companies, reduced the trans-Pacific freight rate for raw silk from $9.00 per hundred pounds to $6.00 (Webber, loc. cit. p. 84). The immediate effect was to increase the raw silk imports on the east coast from 32,000 bales in 1928 to 116,000 bales in 1929, and to 351,000 bales in 1931 (west coast imports that year were 231,000 bales) (see Tables Four and Five, Chapter Three).

In 1929, the Nippon Yusen Kaisha line (owned by the Japanese Government) introduced specially designed fast freighters for the silk trade. They traveled directly to New York City from

the Orient via the Panama Canal (opened in 1914), with a stop in San Francisco to refuel. By 1939 Japanese vessels had captured 90% of the transpacific silk trade (Webber, loc. cit. p. 84; Lamb, *Empress Odyssey*, British Columbia Historical Quarterly, January 1948, p. 38).

Kawasaki Kisen Kaisha freighter Kamakiwa Maru



The *Kamakiwa Maru*, one of four ships of this class, was completed in 1937, and was placed on the Yokohama to New York run via the Panama Canal. She was 471 feet long and had a gross tonnage of 7,350 tons. Being fast, at 21 knots, she was taken over by the Japanese Navy in 1940 and converted to a seaplane tender, and was sunk by US aircraft in 1943 (H. Jentschura, D. Jung, P. Mickel. *Die Japanische Kriegschiffe 1869-1945*, Lehmanns, Muenchen, 1970. ISBN 3469002908).

On April 26, 1937, the Kawasaki Kisen Kaisha steamship *Kamakiwa Maru*, landed 7,000 bales of raw silk worth $2 million, in New York. The trip took 24 days from Yokohama, at an average speed of 21 knots. The *Kamakiwa Maru* was specially equipped to carry oil, with refrigerated space for citrus fruits, rooms for photographic supplies, and a special space for silk (*Japanese Vessel Bringing Raw Silk*, New York Times, April 25, 1937, page 11）.

APPENDIX FIVE

SHIPMENT OF BULLION

As described in the text, silk was transported as quickly as possible, involving as few stops as possible, and in well guarded trains. This procedure was also attractive for shipping other products. Such a shipment, involving gold bullion is described below.

!892 Shipment in the USA. In 1892 the United States Treasury found itself very short of gold coins in the eastern US. It was also faced with the problem of soon having to make some large national and international payments, and the business community was getting upset over the shortage, as well. However, there was an excess of coinage in circulation in the western US. Consequently, the Federal Secretary of the Treasury ordered that $20 million of gold coins were to be transported to the east coast.

It was decided to use the code name "silk train" for this operation. The Southern Pacific Railroad was charged with providing four baggage or express cars for this operation. They were to run through from San Francisco to New York City. Five Assistant Superintendents of the Railway Mail Service and 45 clerks were assembled for the operation. Each clerk was provided with a standard military issue carbine and a 45 caliber Colt revolver. The clerks also received 2,000 carbine cartridges and 1.000 rounds of ammunition.

The shipment contained gold coins in $5, $10 and $20 denominations, which were packed in canvas sacks containing $5,000 each. Eight sacks were then packed in a wooden box which weighed 160 pounds, of which there were 500. Each box was sent as registered mail, sealed with the Treasury Department red seal. The boxes were equally distributed between the four cars, with nine guards per car. The clerks slept on mattresses atop the boxes. The car doors were locked on departure from San Francisco.

The Southern Pacific delivered the train to the Union Pacific at Ogden UT. In turn the Union Pacific delivered the cars to Omaha NE. However, at every stop, guns stuck out of the windows of each car. By the time the train reached Ogden UT, the press knew that something odd was underway, and subsequently followed the train all the way to New York City. The other railroads involved in the east bound run were the Chicago, Burlington and Quincy, Lake Shore and Michigan Southern and the New York Central and Hudson River.

The shipment arrived in Grand Central Station, New York City, without incident, on August 9, 1892 at 10:46. The first delivery was made to the New York Sub-Treasury Building by 12:40 and by mid afternoon the entire shipment was housed in the vault (J.H. Bruns, *The Silk Train*, National Postal Museum En Route vol. 5, #2, 1996 – in Google).

World War One Shipments in Canada. Early in 1916 the Imperial Russian Government, urged on by the impending talk of revolution, took steps to remove the gold in its treasury, to a safer place. In February 1916 a shipment worth $140 million left Vladivostok aboard a Japanese warship. In half a gale the shipment was transferred at sea to HMCS *Rainbow*. The *Rainbow* unloaded the cargo in great secrecy at the CPR docks in Vancouver. The bullion was transferred to a train disguised as a silk train. Men, armed with rifles and revolvers, were stationed in each car. They were warned to keep out of sight when the train stopped for refueling and watering and to keep away from windows when passing through towns. The gold was delivered to the Royal Canadian Mint in Ottawa for safe-keeping.

There were other gold convoys in August 1916, January and August 1917, and February 1919. *Rainbow* does not appear to have been involved in these later shipments. But it seems reasonable that the gold crossed Canada in CPR trains disguised as silk trains (<navalandmilitarymuseum.org/resource_pages/ships/rainbow.html>)

APPENDIX SIX

CHINESE TRAVELLERS

Until 1923, Canada levied a $500.00 head tax on Chinese immigrants. Hence, Chinese in transit across Canada, traveled by train, in bond. If they left the train the railways had to pay the head tax. Hence, great care was taken by the railways, to ensure that all Chinese travelers were delivered to their onward destinations. The usual way in which this situation was handled, was to call the train carrying the Chinese, a "silk train." Alternatively, cars containing Chinese travelers were attached to actual silk trains (*The Silk Train*, En Route vol. 5, #2, 1996; S. Meadows, *Time Meant Everything When the Silk Arrived,* B.C. Magazine, June 16, 1956 quoted in Chambers fonds, loc. cit.).

In one example, the train had eight silk cars, plus six cars with Chinese passengers and a crew car. The crew car held the rear end train crew, the official in charge of the passengers, the cook and his helper, and the guards – 17 in all. The passengers were not allowed to move between the passenger cars, and they were counted twice a day – all 287 of them! (Meadows loc. cit.)

During the First World War the British Government hired Chinese to work behind the lines in France. They arrived from China by ship at Vancouver, and were moved across Canada by train to Halifax, where they took ship to Europe. Three guards were assigned to each railway car. Between July 1917 and April 1918, 48,708 Chinese workers were carried in 67 trains (average about five trains per month). On one occasion, their rice had not arrived on board and they refused to sail. It was finally located in two box cars on a siding in Moncton, NB. The ship was held up until the rice was loaded aboard! (O. Scott, *Canada's National Railways/Their Part in the War,* Canadian National Railways, Montreal, 1921. This was probably a second edition, as there was an anonymous edition published in 1919. It is not clear from the reference whether the CPR was also involved. Herb Dixon is thanked for supplying this reference. Additional information is also available in RG24 National Defence, Series D-1-b, Volume 3767 File 1048-45-2, Access code 90, Parts 1 to 5, 1917, and volume 3769, parts 11 to 13, 1918 to 1920; finding aid 24-176 entitled *Special Cases of Transportation – Chinese Coolies, Overseas*).

The Chinese workers were also returned home via "the North American land bridge" (National Defence, loc. cit., vol. 3771 and 3772, parts 1 to 4, 1919-30, and part 5, 1920 to 1923, entitled *Special Cases of Transportation – Return of Chinese Coolies from Overseas*). (The author has not examined any of the National Defence Documents).

APPENDIX SEVEN

MOVEMENT OF SILK BY TRAIN IN THE NEW YORK CITY AREA

The following section deals with the theft of silk from trains other than silk trains. The silk trains operated from coast to coast as has been described. While, in the New York City area, silk was moved between warehouses and silk mills, and between silk mills, and retail outlets. Some of these cargoes were carried in box baggage cars and express cars of which there were seldom more than one or two per train.

The transcontinental silk trains terminated in railway yards in New York City NY, Hoboken NJ, Jersey City NJ and Weehawken NJ. In some cases the cars were later moved to sidings alongside

mills in the vicinity of New York. Or they were unloaded, and the bales of raw silk moved to warehouses. From there they were moved by dray, truck or railway cars to the mills. Thus, there was plenty of opportunity for theft. These shipments were often not too well guarded. Also, on occasion, bales of silk were stored overnight in railway or express company baggage sheds, without necessarily being closely guarded.

One method used by truckers collecting bales of silk from trains in railway yards, was to steal or forge a freight clerk's receiving stamp. Thus, a thief could show anyone questioning him, that he had a properly receipted bill of lading from the railroad (New York Times, February 8, 1920).

Another method was to enter the freight yard with a stolen truck, laden with empty containers. The trucker would then substitute the empty containers with ones containing valuable goods, and leave the gate with the same number of containers as he entered with (New YorkTimes, ibid.).

Around 1916-1917 there appear to have been two major theft gangs in operation. And they sometimes murdered the personnel delivering the silk goods. Their activities were concentrated around the silk warehouses in New York City and Hoboken NJ.

The trade association, *The Silk Association of America*, had a great deal of difficulty convincing its members to report thefts. This was because all silk movements were insured, so that a silk mill was not out of pocket if a theft occurred when silk was being delivered. In 1918 the *Association* created a *Missing Silk Bureau* to work with the police to trace and recover silk stolen from warehouses or in transit. Over the next few years the problem seems to have been brought under control (*New York Times* March 24, 1918).

Between July 1, 1917 and February 28, 1919 there were over 1,000 thefts of silk investigated with losses totaling about $1.7 million. Of these 448 cases were closed and almost $940,000 worth of silk recovered. Forty-five convictions were obtained and one of the two major gangs involved in silk thefts was broken up (New York Times April 8, 1919).

Substantial losses of silk in less-than-carload lots were being experienced by railways in the New York area. Their losses exceeded their revenue. Consequently such shipments were prohibited after February 20, 1920 (*Heavy Silk Thefts Bring Changes in Rate Classification*, Ogden UT Examiner, February 13, 1920).

Due to high losses from pilfering silk, the United States Railroad Administration placed an embargo on the shipment of silk in the New York area in 1918. The next year *The Silk Association of America* got the Administration to agree to lift the embargo. The Erie Railroad was to ship from Pier 21 on Mondays, the Lehigh Valley from Pier 34 on Tuesdays, the Delaware, Lackawanna and Western from Pier 41 on Wednesdays and the Central Railroad of New Jersey from Pier 39 on Thursdays. The Erie Railroad was also to accept less than carload lots of silk at the Cedar Street station in Paterson NJ on Tuesdays (New York Times February 27, 1919).

In June 1918 the *Silk Association of America* noted that since January 1, thieves had operated 184 times in New York and New Jersey, stealing silk worth not less than $1.5 million. Lofts,

railroad cars, and express company stations had been robbed both during the day and at night. The Erie Railroad alone had suffered losses of about $750,000, and other railroads had reported thefts "as proportionally as large." "The list of robberies, with details of stolen goods, covered fifteen closely typewritten pages." (Railway Age, Vol. 64. #23, June 7, 1918, p. 1398).

In 1918 the Delaware, Lackawanna and Western, Erie, Lehigh Valley, and Central Railroad of New Jersey placed an embargo on silk shipments due to high losses from pilfering. (Hubbard, loc. cit.).

By September 1919, the *Missing Silk Bureau* had recovered 80% of the raw and manufactured silk reported stolen. Some of it had been recovered from Chicago and St. Louis. The total value was around $3 million. Much of the silk had been stolen from the terminal yards (New York Times, September 22, 1918).

On January 28, 1920 the Central Railroad of New Jersey, the New York Central Railroad, the Erie Railroad, and the Pennsylvania Railroad jointly obtained a court order requiring the raw silk be shipped only on express cars, in place of freight cars. The American Raw Silk Company and the *Silk Association of America* went to court to complain about the increased costs that this change would require. On February 29, 1920 the judge enjoined the Director General of Railroads from putting the order into effect.

Shortly thereafter, a lower court ruling was rejected by a Federal Court – the railroads had to carry silk as one of the elemental duties of a common carrier. But the roads could fix freight rates proportional to the value of the silk, and the risk of carrying it (New York Times, March 30, 1920).

To better counteract silk theft the *Textile Transit Insurance Company* was created to succeed the *Missing Silk Bureau*. The total value of the shipments to be insured on an annual basis amounted to $500 million. This sum was considerably more than the actual value of the goods, since four or five shipments were common between the warehoused raw silk and the final retail outlet – from one silk processor to another. The insurance rates had varied between 7.5 cents and 15 cents per $100 of value. The formation of the *Textile Transit Insurance Company* resulted in a 2 to 3 cents reduction in the premiums (New York Times, March 25 and April 1, 1920).

Between January 1 and September 1 1923, $600,000 of raw and broad (i.e., manufactured) silk was stolen, of which $450,000 was raw silk. By this time silk was seldom stolen from silk trains, as it was so much easier to steal it from cars in railway yards, company spurs, warehouses, etc. in the vicinity of New York City. (*Frequent Thefts of Silk Material*, New York Times September 9, 1923, p. E12).The railways used in transferring the silk goods in less than train lots were mostly the Central Railroad of New Jersey, Delaware, Lackawanna and Western, Erie, Lehigh Valley, New York Central, New York New Haven and Hartford and Pennsylvania. The quantities involved in each shipment were often such that express companies and trucking companies were active competitors.

There was an interesting announcement in Railway Age in 1932. Freight rates for silk conveyed to Alabama, Florida, Georgia, Kentucky, Mississippi, North Carolina, South Carolina,

Tennessee, Louisiana and parts of West Virginia, from the west coast, were reduced to $6.00 per hundred pounds from $9.00. The new rate was to become effective on April 11. Raw silk landed at ports other than San Francisco and Los Angeles routed to the states noted above, could be held at Chicago IL for throwing and testing. This is the only record seen which noted that raw silk was delivered to the southern US. It is not known whether the volumes of silk warranted a silk train, or whether it was conveyed in head-end cars on passenger trains (Railway Age, Vol. 92, #13, 1932, p. 545).

Theft from American Railway Express Company. Between September 1, 1919 and January 1, 1920, over $200,000 of raw silk was stolen from the express company's warehouse in Paterson NJ. At least six policemen and two silk company owners were involved (New York Times, April 22, 1920).

Sixteen men were arrested for stealing raw silk from a Railway Express Company facility. Four of the men were senior officials of two different silk companies, while one was an express agency employee (New York Times, April 21, 1920).

Theft on Central Railroad of New Jersey. Train # 512 bound from Jersey City NJ to Washington DC was robbed on March 11, 1921. The train was made up of seven express cars (it is not known if all these cars carried raw silk). The crew consisted of an engineer a fireman a conductor and one or two guards. The robbery took place in Jersey City NJ, and was detected when the conductor of a passing train saw an express door open and men inside the car. By the time the train was stopped and the police had arrived there was no sight of the thieves. Part of the proceeds – bales of silk – were recovered by police the following morning, (New York Times, March 12, 1921).

Thefts on the Delaware, Lackawanna and Western Railroad. The theft occurred west of Stroudsberg, PA. on February 20, 1919. The freight train had apparently been followed by the thieves in an automobile, westbound from Paterson NJ, 69 miles away. Fourteen bales of raw silk were thrown from the train, but the thieves were intercepted by Railway Police. All the silk was recovered and one robber was arrested (Railway Age, Vol. 66, #9, February 28, 1919, p. 512).

The Ossian gang robbed several of the Delaware, Lackawanna and Western Railroad's trains in the early 1920's when they slowed for River Junction, NY. It was generally believed the gang had a mole in the Hornell, NY Yard who let them know when the silk train was coming. Several members of the gang were captured in 1924 according to the Hornell Evening Tribune. (Wdburt_@aol.com, 2007-04-17).

Thefts on the Erie Railroad. An Erie freight was held up near Glen Rock NJ on October 20, 1915. One thief held the train crew under armed guard, while the others broke into a freight car thought to contain raw silk. Erie Railroad Police, who were riding on the train, fired into the freight car. The thieves returned the gunfire but managed to escape using an automobile waiting nearby (Railway Age Gazette, Vol. 59, October 22, 1915, p. 767).

On December 17, 1925 Erie Railroad through express passenger train #13 left Jersey City at 22:30 bound for Chicago IL. Between Croxton NJ and Rutherford NJ the conductor noticed bales of silk strewn along the right of way. The train was bought to an emergency stop and the train crew inspected the exterior of the train. Two doors had been opened on adjacent cars, but no robbers were found. The train proceeded to Port Jervis NJ where the police were notified and commenced their investigation. The crew of a subsequent train, picked up the silk bales along the right of way and took them to Jersey City NJ, from where they were removed to the Rutherford NJ station. (New York Times, December 18, 1925).

On March 21, 1931, at 08:15, thieves escaped with about $10,000 worth of raw silk (ten bales) from the Erie Railroad station in Scranton PA. The ten bales were stored in the baggage room. The thieves missed another ten bales, also stored there. The shipment had arrived the previous evening and a railway policeman guarded it overnight. He went off duty at 07:00, when many station employees reported for work. At about 08:35 the freight house foreman noticed a truck leaving the premises. It belonged to a local electrical contractor, whom the foreman knew, but there were no shipments for him. It later transpired that the truck had been stolen, but was found later in the contractor's driveway. Apparently a car cleaner had unlocked the baggage shed after the guard had left which enabled the thieves to enter the shed (Scranton Times March 21, 1931. Reference provided by Mike Oravec, MOEL@paonline.com).

Theft on New York Central Railroad. Five men were arrested for stealing five tons of raw silk valued at $218,000 on April 8, 1920. The silk was in a freight car in the New York Central's west side yard in New York City. The cars were waiting for a train to take them to another state. The thieves had unwrapped many of the bales and were in the process of burning the burlap covering when arrested. Several of the men arrested had been freight handlers in the yard (New York Times, April 21, 1920).

Theft from South Manchester Railroad. This two and a quarter mile long railroad ran from Manchester CT to South Manchester. It served the Cheney Brothers Silk Manufacturing Company and other industries. The road connected with the New York, New Haven & Hartford Railroad.

On January 30, 1919 at about midnight, thieves stole several bales of silk from a box car spotted on the Cheney Mill spur. A Company guard was shot and killed during the robbery. The Company soon built a windowless concrete structure, with heavy double steel doors at each end, to house two box cars. Silk laden cars were stored in this structure, until they could be unloaded. Apparently there were no further thefts from rail cars the mill site. (T.R. Lewis, *Silk Along Steel*, Pequot Press, Chester CT, 1976. ISBN 87106068X).