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ENGINEERING HISTORY PAPER #74

“The Silk Roads”

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(produced as Cedargrove Series #49/2018 – Mar 2018)

EIC HISTORY AND ARCHIVES

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Abstract

This paper is a little different. Instead of being in the usual narrative form, the text is a series of sequential notes on the subject matter, with a few accompanying photographs and maps, based on the author's recent original powerpoint presentation.

The paper notes briefly the histories and circumstances of the Silk Road of antiquity and the new Silk Road that is presently under discussion and construction, but with very little direct reference to their engineering.

The powerpoint version was presented by the author to the Ottawa Branch of the Canadian Society of Senior Engineers on March 19.

About this Series

Principally, the Cedargrove Series is intended to preserve some of the research, writings and oral presentations that the author has completed over the past half-century or so, but has not yet published. It is, therefore, a modern-day variant of the privately-published books and pamphlets written by his forebears, such as his paternal grandfather and grandmother, and his grandfather's brother John.

About the Author

He is a graduate in mechanical engineering and the liberal arts and has held technical, administrative, research and management positions in industry in the United Kingdom and the public service of Canada, from which he retired over 30 years ago.

He became actively interested in the history of engineering on his appointment in 1975 to chair the first history committee of the Canadian Society for Mechanical Engineering, and has served both CSME and the Engineering Institute of Canada in this capacity for varying periods of time until 2003. He has since provided history-related advice and assistance to CSME, EIC and the Canadian Society of Senior Engineers.

This paper is based on the text of a powerpoint presentation made recently by the author in which he drew attention to the histories of the Silk Road of antiquity, established by authorities in China over 2000 years ago, and the Silk Road currently being established, also by the leadership of China. It is factual rather than discussive, shorter rather than longer, and light on engineering details.

This paper is about the old Silk Road as well as the new one. They were (are are) basically land-based trade routes with maritime components. And they were both initiated in China.

*

What got me started looking into these Roads? For the old one, it was a photograph in a review of a new book on the history of Central Asia with the subtitle, *The Age of the Silk Roads*. The photograph showed an ancient, rickety, wooden bridge, built on the cantilever principle, over which a traveller and his loaded donkey were crossing a gorge somewhere in the 3,800-metre-high Baroghil Pass that leads from Afghanistan to Pakistan. In other words, it represented what could have happened somewhere along the old Silk Road a thousand or more years ago.

For the new one, it was reading on the Internet about Chinese President Xi and his proposals for it...

...plus the designation by UNESCO in 2014 of a series of 30-odd sites on the stretch of the old Silk Road running from Chang'an in China along the Tianshan corridor to Kyrgyzstan, as part of its World Heritage Sites program.

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I have included a few photographs from the powerpoint presentation. Generally speaking, they represent old Road structures from its later history, although the scenery photographs are contemporary.

*

The old Silk Road...

Silk was first made in China around 2700 BC, but the production of silk threads was kept secret for over 3000 years. It was first known outside China in India, Japan and Persia.

The Silk Road really didn't have a name until, late in the 19th century, a German geographer studying it - Friedrich von Richthofen, uncle of the Red Baron - gave it the name *Seidenstrasse*.

History tells us that the Silk Road 'went into operation' in the second century BC, after Han Emperor Wu, tired of harassment by nomadic tribes to his west, sent General Zhang Qian to negotiate an end to it. He did more than that. He found that the nomads were raising magnificent horses that his Emperor's army could use and that he could trade silk for them.

*

However, three earlier events influenced the 'construction' of the Road.

A Royal Road had been laid out in Persia in the 5th century BC. It joined what is now Iran to Turkey...It was subsequently 'hooked up' to the Silk Road.

In the 4th century BC, a Great Royal Road was laid out across India, from Calcutta (as it used to be called) on the Bay of Bengal, northwestwards through Delhi to the Punjab...where it, too, was subsequently 'hooked up' to the Road.

The third event was the 4th century BC incursion into Central Asia of Alexander the Great, which brought Europeans closer to China for the first time.

It is thought that the first contact between Europeans and Chinese took place around 200 BC - before Qian's journey - and involved the descendants of wounded survivors of Alexander's army who had stayed behind in Asia to recover.

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The Road was at least 8,000 km long 'as the crow flew.' It was developed piecemeal, and it was the first international attempt at 'globalization.'

At the eastern end, the Great Wall of China was extended westwards to provide protection for some of the Road.

Traders did not travel the whole length of the Road, but did business with other traders at the many stopping points along the way.

These stopping points were often caravanserais, a day's journey apart, and there were often cairns within eyeshot along the way to help with navigation.

*

The old Road began at Chang'an in central China and travelled westwards to Dunhuang, where it split into three, one branch going north, another south and a third partly through, the Taklamakan desert, staying north of the Tibetan Plateau, and meeting up at Kashgar at the eastern end of the Tianshan mountains.

From there, one branch went west across Iran, Iraq and Syria to the Mediterranean. Another went northwest by way of Samarkand to the Caspian Sea, across it, and down into Turkey and the Med.

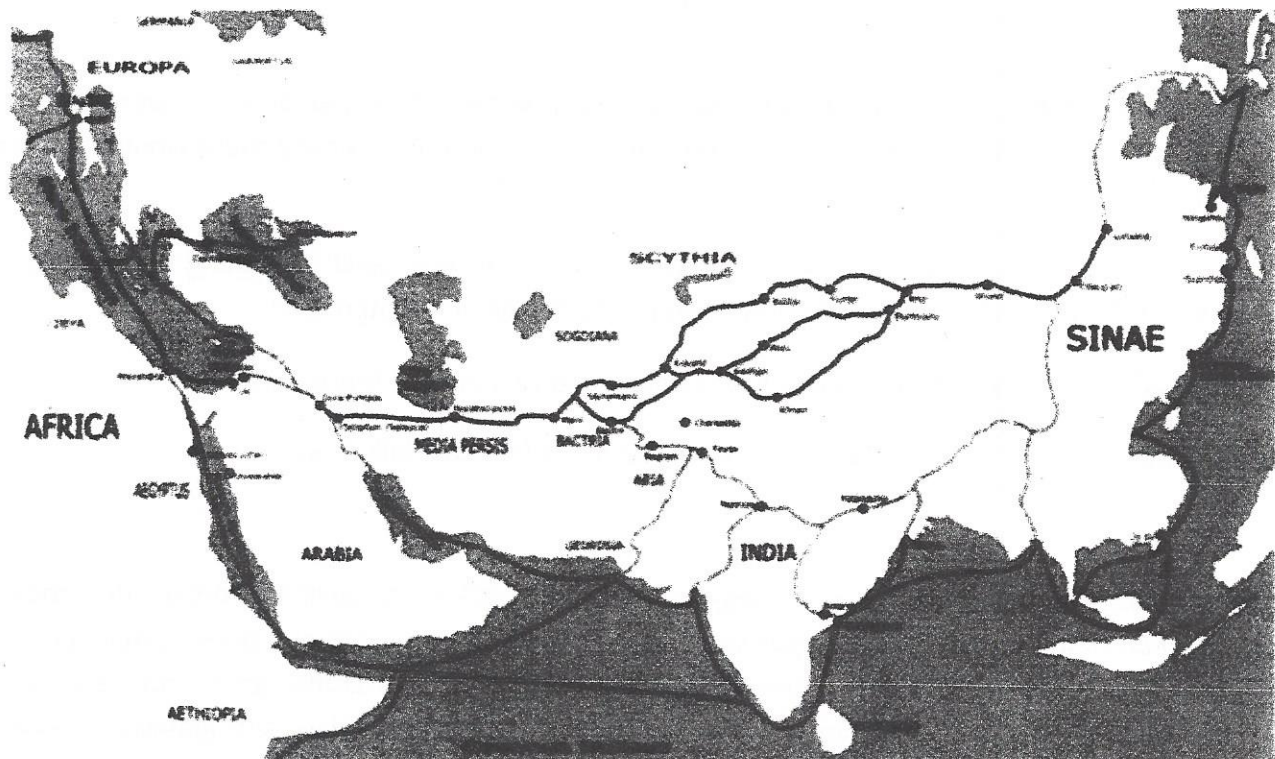
The most frequent Med. destinations were Rome, whose elites were attracted to silk garments, and Venice.

Maps showing the old Silk Road all seem to be different. The one below is an example. It also shows the maritime component, about which more in a moment.



by Shizhao

published on 26 April 2012



*

The tracks of the old Road took centuries to develop. Their elevation varied from 150 metres below sea level to a height of several thousand metres above it. The Road crossed lakes, rivers, salt flats, deserts, mountain ranges, steppes and oases, and the climate went from desert drought to semi-humid grassland to snow and ice.

The main beasts of burden were camels and horses, with the assistance of mules and donkeys.

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The map above shows traces of the maritime component of the old Silk Road, otherwise known as the Spice Road since a major component of maritime trade was getting the products of the Pacific Spice Islands, such as cinnamon, peppers, nutmeg and ginger, to Europe.

The maritime component was also needed for trade from South Asia to Europe since the Road was so far to the north of it. Countries such as Japan, Korea, (modern) Indonesia and Viet Nam used this component exclusively. It also affected trade with the Horn of Africa, Arabia, the Red Sea and the Mediterranean.

In the end, however, it was the maritime component that 'killed' the Road. More on this later.

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The Silk Road was a very dangerous place to travel. Bandits were pervasive, so were wolves. Starvation was not unknown, neither were sandstorms. And occasionally there would be wars and insurrections.

For example, one reason the northerly Caspian Sea route was used by trading Romans for a time resulted from Rome's lengthy war with the Parthians of Northern Iran.

The trading post/caravanserai system was developed to minimise these problems.

Goods also flowed north to Russia and south to Persia from the Silk Road.

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Essentially, trading along the Road began with Chinese silk going west and horses (like those that Qian found) going east. It expanded into westward trade in jade and other jewels, paper, paper currency and printed products, tea, porcelain, lacquer crafts, gold, iron, salt and gunpowder. Eastward went woodwork and metalwork products, glass and glassware, tools, animal hides, grains, some perishable fruit and vegetables. At different times, the Road carried

different goods. Paper went later than, but as well as, silk. Some of these products also went by sea.

Artwork went in both directions, as did languages, cultures and religions, as well as old and new intellectual skills.

From the engineering point of view, the technology of irrigation systems went east. One of the later machines to go both ways was the noria, or waterwheel. The Persian and Chinese versions were of different designs.

Agricultural and warlike machinery also moved more easily along the Road after iron could be used to make it.

The Road also provided a pathway for armies moving in both directions. The Romans used it to get to Parthia and the Moguls used it when they besieged Baghdad.

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The Road also gave rise to 'by products.' For example, the Island of Kos in the eastern Mediterranean became a centre for the manufacture of clothing made from Chinese silk, much of it for the Roman market.

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The influence of this market on Silk Road trade changed in the late 5th century AD with the fall of the Roman Empire of the West. But the Empire of the East, based on Constantinople, took over. Emperor Justinian, in the 6th century, also broke the Chinese silkworm secret when he sent two 'monks' eastward to steal, not worms, but their eggs.

The influence of the Empire of the East fell, in turn, when conquered by the Ottoman Empire in the 15th century.

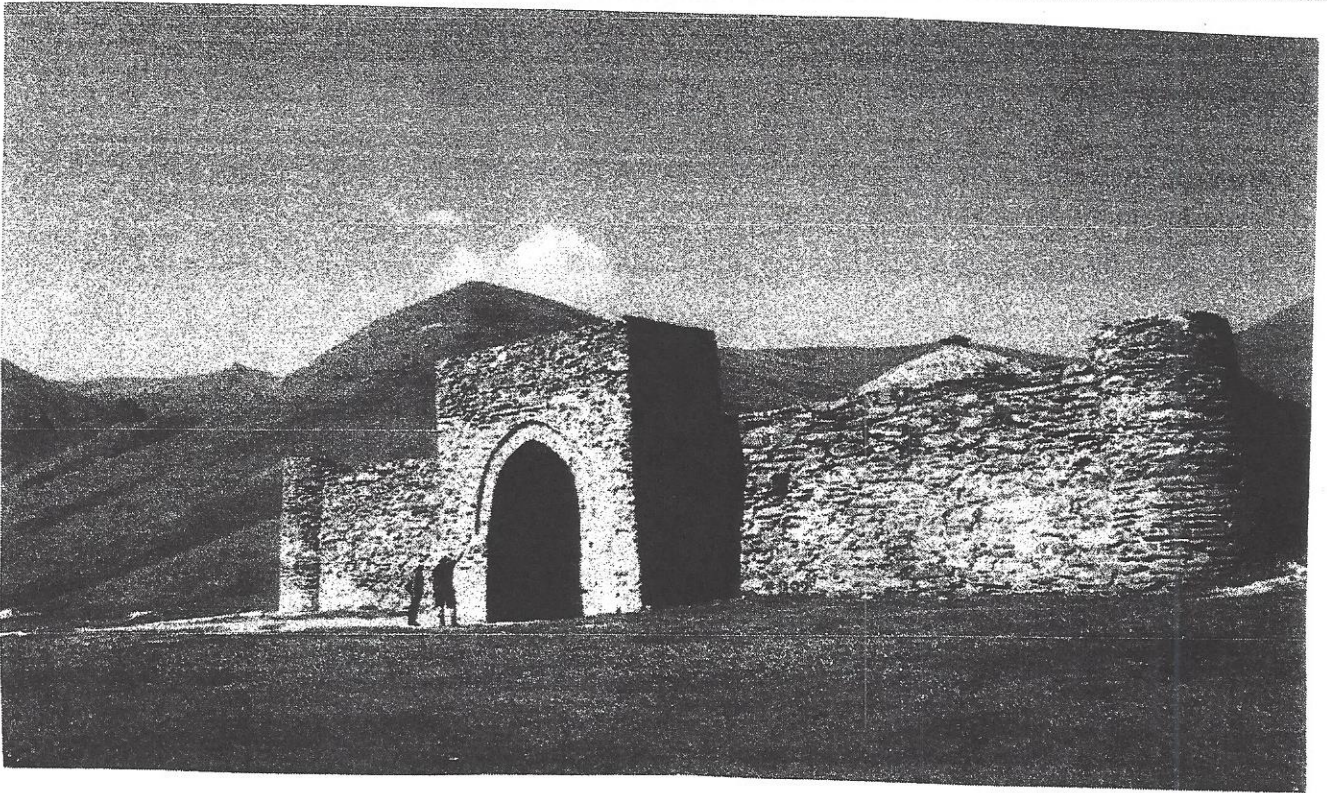
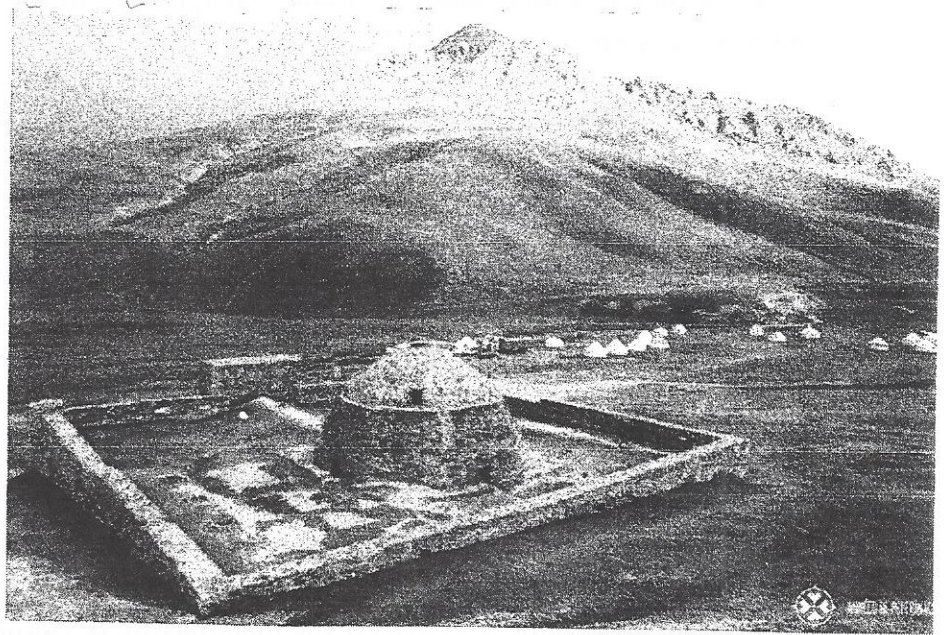
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Meanwhile, towards the end of the 13th century, an intrepid Venetian traveller named Marco Polo, with his father and uncle, took over three years to reach China along the Road. They stayed and worked at the Mongol court of the Kublai Khan for 17 years before returning home by sea. Marco wrote a book about his trip. Thanks to the Mongol influence and policing, the 13th century was also one of the 'quietest' periods on the Silk Road.

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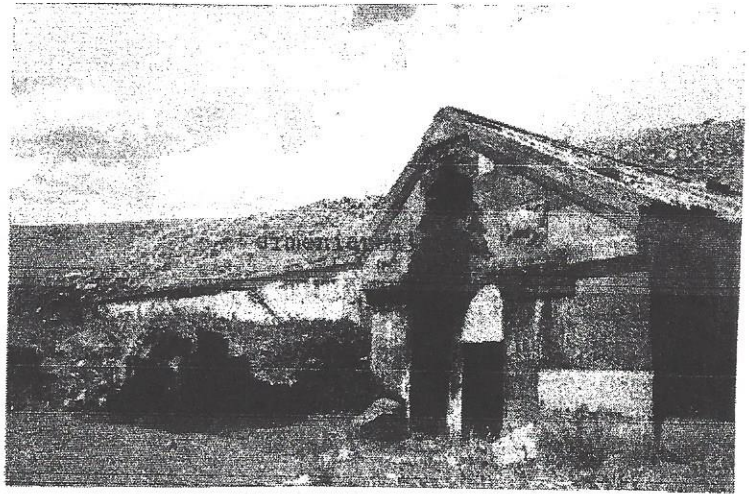
Some photographs pertaining to the Silk Road...

Tash Rabat Fortress, Kyrgyzstan,
built in the 10th Century, possibly,
restored as a museum in the 1980s

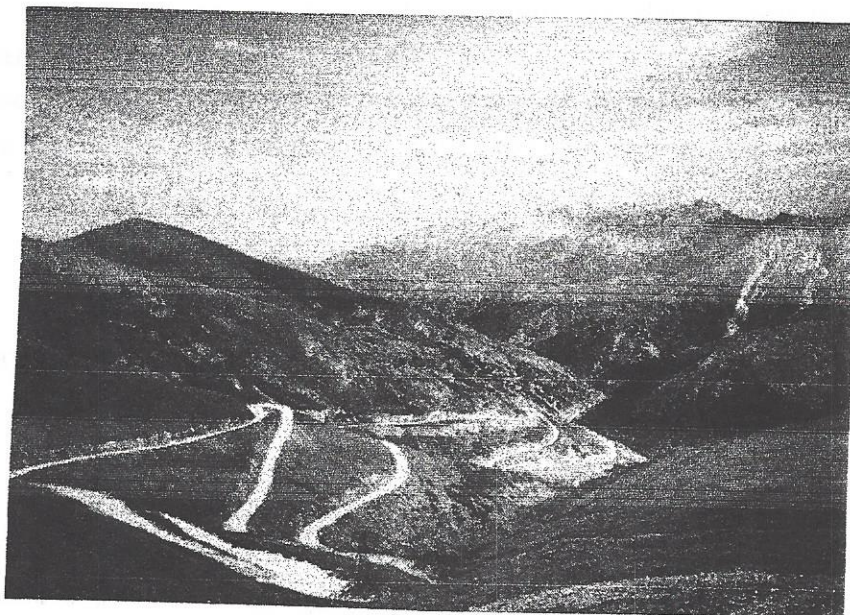


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Selim caravanserai, Armenia,
built in the 14th century
restored in the 1950s...
caravanserais were the motels
of the medieval world!



Along the way...



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In the 13th century, intellectual activities were evident along the Silk Road in places such as Samarkand and nearby Tashkent. Scholar Al-Khwarizimi, for example, has been credited with contributing to the invention of algebra.

But the 14th century may well have held bad news for Europe. It has been surmised that, in the 1340s, the bubonic plague known as the Black Death, which decimated that continent's population, had been brought westwards along the Silk Road. The Road was apparently closed down at this time, but reopened sometime later.

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The Mongols lost control over the Road in the late 14th century. But it stayed open until the 15th, when the Ottoman Empire at Constantinople closed it down, although it 'sputtered' for another hundred years.

*

But there was another reason for its collapse...

The so-called *Age of Discovery* began in the 15th century when European sailors began to explore the world's seas and to take over much of the world's trading activity...when not behaving as pirates!

This *Age* was made possible by improved ship and sail design and the development of navigation instruments, all of which allowed ships to venture farther and faster out to sea and farther away from home, discover America, and round the Cape of Good Hope and Cape Horn. As well, rivalries grew between European countries vying for influence in the Far East.

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The new Silk Road...

A railroad from China to Russia was completed in 1990 and apparently 'triggered' thoughts of a new Silk Road.

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A modern 'Silk Road' between Europe and Asia is already in operation. The German firm, DHL Freight, founded in 2007, offers customers a rail-highway alternative to existing air and sea routes. From its terminal at Duisburg, it will take freight to China intermodally, taking

advantage of improvements along the route that China, for example, has already made. And it will bring merchandise from China to Europe. By 2011, this firm was offering a 13-day overland trip (both ways) in place of 36 days by sea, although sea freight would be cheaper. Goods are shipped almost universally in containers.

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In 2013, President Xi of China announced plans to build a new Silk Road, with land and marine components. He called it 'One Belt, One Road' (OBOR), which became the Belt and Road Initiative (BRI). More detail was added over the next two years. The BRI is essentially a Chinese attempt to contribute to the globalization of trade, to help some of the participating countries generate tax revenues, and to employ thousands of people.

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The continental component of the BRI will be based on railroads, some of which have already been built and are in operation. These will be supplemented where appropriate by highways, pipelines and electrical grids.

The new Road could gain business by making faster travel from China to Europe than is possible by sea. On the other hand, transportation by ship could be less expensive per unit. Air travel will not be an included option.

*

Roughly speaking, the new *northern* Silk Road will start in Central China and move east through Khorgos on the China/Kyrgyzstan border and across Russia to Moscow, and from there to Germany and Holland, with a branch reaching Germany through Kiev in the Ukraine. The *southern* Road will branch off before Khorgos and head for Kashgar on China's western border, and from there due west to Turkey and Eastern Europe.

There will also be a Pakistan/China economic corridor linking Gwadar on the Arabian Sea with Kashgar on the new Silk Road, using upgraded rail and motorway facilities that already exist in Pakistan.

The city of Khorgos has been independently developed by China since 2011. It is now a thriving commercial railroad centre and will play a major role in the BRI.

A number of railroad projects are under way, including links to Laos and Thailand and the maritime component.

In 2016 the first BRI train reached Teheran from China.

*

The maritime component of the new Road will follow the coast of China south to Viet Nam, Indonesia, Singapore, Malaysia, the Gulf of Bengal and Sri Lanka. From there it will go north to Gwadar in Pakistan and on to the Persian Gulf. After the Gulf, the connections will be by way of the Indian Ocean to Kenya and the Red Sea, then through the Suez Canal to the Mediterranean. Railways will also be built across Africa to the South Atlantic.

New port facilities have already been established in Sri Lanka and Kenya.

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The BRI has been designed to span 65 countries across four continents and to include 70 per cent of the World's population.

Russia has supported the BRI, India has not. Japan began as unenthusiastic but, by 2017, had become a supporter. The United States is not currently interested.

*

The Government of China has estimated that it will arrange funding for the new Silk Road in the order of US\$900 bn (or more). Its own direct share of this will be US\$250 bn (or more) and the balance is to come from the China Development Bank and other private sources.

Meanwhile, the Asian Infrastructure Investment Bank (AIIB) was established in 2016 to help organize funding for the BRI, and some 60 countries now belong to it.

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Essentially, the cities and towns that spring up along the BRI will replace the caravanserais of the old Silk Road, but there will be no need to ensure that the gaps between them represent a day's travel!

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In May 2017, President Xi convened a conference of the 60-odd countries that are interested in participating in the BRI and its maritime component. Canada was not among them.

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Most recently, China announced that it hoped there would be an 'Ice Silk Road' component of the BRI, which would have as participants those countries with ice-free Arctic shorelines, including the U.S., Canada and Norway, as well as countries wishing to use Arctic waters for their shipping.

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New Silk Road considerations:

Loads going from China to Europe, Asia and Africa will be no problem. But what will go the other way?

Central Asian and African markets are currently weak in comparison with European ones. Can they be cost effective?

Perishable fruit and vegetables will fly anyway.

Electronic equipment may well go by sea since the transportation costs will be lower.

Will the benefits of the BRI accrue mostly to the towns and cities en route?

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Photo Credits:

Map of the old Silk Road: <http://www.ancient.eu/image/146/>

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