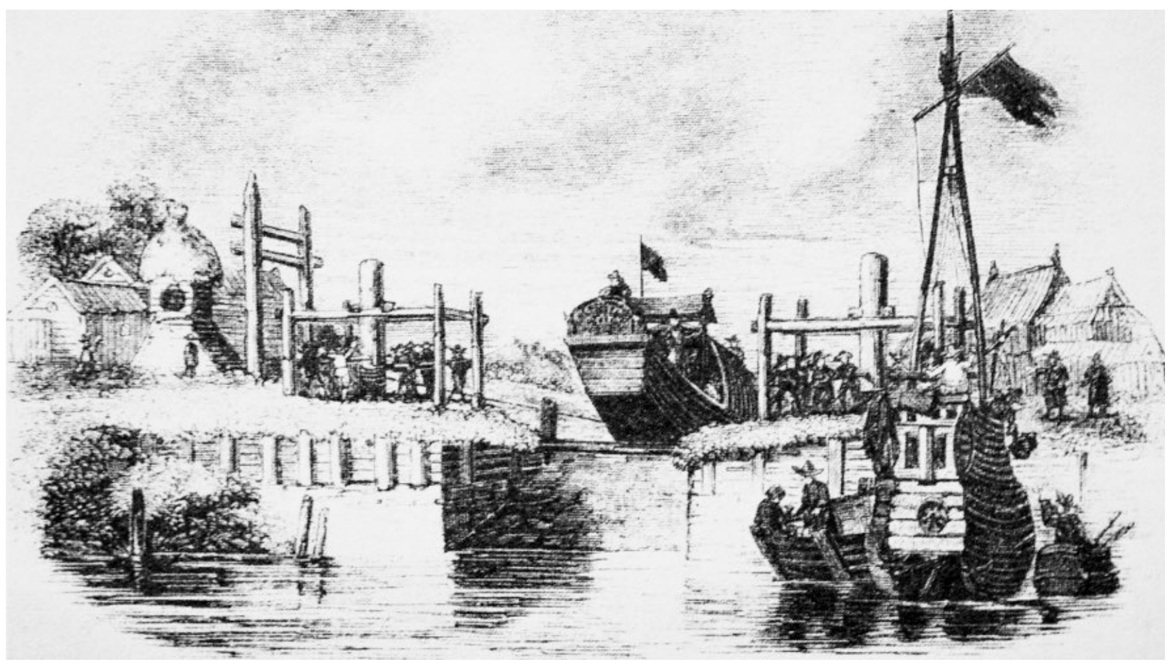
China's Grand Canal

The Grand Canal is possibly the most important factor in the cultural and economic development of China. Over 1000 miles in length, for centuries it joined the rice-growing area of the Yangtze Valley with Beijing, though in earlier times the canal ran on a more westerly route to the old capital of Chang'an. The canal allowed the rice tax to be transported northwards, where it could help to feed the army guarding China's northern border. It also carried other cargoes, allowing goods to be carried north-south without having to go by sea, where boats could be captured by pirates. Because of its cultural importance to China, and because of the development in canal technology during its construction and operation, it is currently being suggested as a World Heritage Site.

Today, the original canal at Gaoyou, to the north of Yangzhou, is just a ditch, with the modern canal off the photo to the right. In the distance is Gaoyou Lake, one of several lakes in the area which help with flood control, and once supplied the canal with water.

The map above gives some idea of the size of the canal, and the various routes it has used over the centuries.

Right: In the late eighteenth century, there were a number of British expeditions to China, and much of the European knowledge of the canal dates from this time. By then, chamber locks were no longer used, and they had been replaced by inclines as illustrated in this contemporary drawing. Flash locks, with a single gate holding back a variation in level of perhaps one foot, were also used as the flow of water they created could be used for moving any silt which had entered from the rivers feeding the canal.



Above: A lock in Suqian province, with typical modern Chinese canal boats heading north for a cargo.

Above: In Cangzhou province just south of Beijing, the canal is no longer in use, though it is proposed to rebuild it to channel water from central China to the drier northern parts.

Above: The canal formed part of China's postal system, and once there were thirty postal stations along its banks. Today, just one survives, at Gaoyou. It is preserved as a museum, showing the life of the government officials who controlled the canal and those who worked on it.

The canal's route was influenced by the Yellow River which passes through 'loewes', a very soft rock, creating a large amount of silt. Siltation in the river's lower reaches caused its route to vary dramatically. Prior to 1288, the river followed its present route, but from then until 1855 it turned south east to join the River Huai near Hongze Lake, before flowing into the Yellow Sea. The new river mouth was some 250 miles further south, which gives some idea of the scale of the change. In 1855 it changed again, reverting to its old route to the Bohai Gulf.

The canal was to carry the rice tax from the Yangtze delta to Chang'an, the old capital. It developed between 300BC and 200AD, to link Hangzhou with Luoyang on the Yellow River. The capital then moved to Beijing, and the canal had to be extended. The section running north from Yangzhou is the oldest part of the Grand Canal and was built around 600AD.

By the end of the thirteenth century, the build-up of sediment caused the lower Yellow River to move south. The canal from Hangzhou to the River Huai and Hongze Lake survived, but a new canal had to be built northwards to serve Beijing. Locks were needed on this new section as it crossed the ridge of higher land in Shangdou.

Fleets carrying the rice began their journey around March. It would take until July to reach the Yellow River, with the journey timed to reach the crossing when the river level was high. The fleet then sailed by canal to Beijing, unloaded, and had to get back at the Yellow River before the end of September when there was still sufficient water for them to cross. If they did not manage this, the boats could be iced-in on the canal, as well as being unavailable for the next year's cargo.

The dam at Hongze Lake is, with regard to canal technology, one of the canal's most important historic sites.

It was the need to prevent siltation, and the sheer number of boats operating on the canal, which made the canal's engineers use flash locks and inclines, rather than pound locks. There were some pound locks, and they were used in China well before Europe, but their use diminished over the years, possibly because siltation became greater because of the effect of the Yellow River.

In 1855 the river changed its course to the north, leaving much of the central section of the Grand Canal in a poor state. The canal declined until the centre section was virtually impassible. It was only after the formation of the new Chinese Republic that a programme of canal regeneration was begun. Much of the southern section has been enlarged since the Second World War and is well used, but the northern sections of the canal are impassable.

A recent photo of canal boats under way in Huaian province.

http://whc.unesco.org/en/tentativelists/5318/
http://www.absoluteastronomy.com/topics/Grand_Canal_of_China

World Heritage Waterway Sites