



Rice milling around the World: The early uses of waterpower

Milling journals of the past at The Mills Archive

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In the previous issue of *Milling and Grain*, I mentioned that the Mills Archive library holds a number of books, catalogues and images on rice production from all corners of the world. This article moves on from the early primitive methods that I

illustrated last time, to examine the introduction of waterpower in rice milling. Next month I will look at what our holdings show of the early stages of industrialisation of rice milling.

Rice is the seed of the grass species *Oryza sativa* (Asian rice) or *Oryza glaberrima* (African rice). As a cereal grain, it is the most widely consumed staple food for a large part of the world's human population, especially in Asia. It is the agricultural commodity with the third-highest worldwide production, after sugarcane and maize.

A good friend in Japan gave me samples which show rice in its various states from fresh grains of rice with their husk on to the finished, polished rice. I have tried, with the help of our Archivist, to translate the writing on the packets. They are shown here to make the point that, as an educational institution, the Mills Archive tries to set its holdings into context. If anyone can help with a more detailed account, we would be happy to add it to our website (<https://millsarchive.org/explore/features-and-articles>).

There are dozens of articles on rice milling in early editions of *The Miller* (for example Volume 8, 1882, pages: 70, 352, 431, 526, 604 and 927). Most emphasise the large gulf between primitive Asian technology and modern European milling methods, without acknowledging the rapid development of the uses of waterpower well before their adoption in the West. Needham (*Science and Civilisation in China*, 1965) points out that some modern western historians of technology erroneously inform us that “the water-wheel certainly travelled east”. This would have been a surprise to the Chinese at least by 20 CE when Huan Tan wrote “Afterwards the power of animals - donkeys, mules, oxen and horses - was applied by means of machinery, and water-power too used for pounding, so that the benefit was increased a hundred-fold.”

Using the whole weight of the body treading on a tilt hammer increased its power by a factor of ten. Simple and progressive improvements using multiple hammers were an additional benefit of hydraulic power, easily introduced in the wet areas required for rice cultivation. The illustrations here are a small sample of those in our



Rice grains to polished rice



Treading on a tilt hammer



Primitive rice hulling in China using water power

collections of more than two million records and serve to illustrate the wide date range we cover.

As today's photographs record tomorrow's history we are keen to collect contemporary as well as historical material. For example, on one of my trips abroad I visited several traditional water-powered rice mills in Portugal. They



Japanese rice mill engraving



Japanese rice mill and waterwheel in 1980



Primitive rice mill building now in a Japanese museum



Interior of a rice mill Sobreiro, Portugal 2004



Miller at work in a rice mill Sallgueirinha, Portugal 2004

were milling both rice and other cereals with millstones. The unusual thing about the rice milling process at Sallgueirinha was that the lower or bedstone of the pair of millstones was covered in cork around 20cms thick. The rice entered the stones in the same way as grain, into the eye (centre) via a hopper fixed above the stones. It came out round the edge de husked. It was then passed through another set of millstones to produce the rice flour.

In another mill the cork was placed on the lower stone in wedge shaped strips, The motive power for all these mills came from waterwheels, which in some cases were horizontal, and turned the stones at around 80 or 90 rpm. These articles only give a brief glimpse of the several million records held by the Mills Archive Trust. If you would like to know more please email me at mills@millsarchive.org.