

MUSCLE POWER

The first energy form



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Muscular energy was the first energy form to be used by humanity. First, people used the force of their own muscles, later they harnessed that of other animals and that of other people to carry out forced labour. During the Middle Ages, the use of harnesses and horseshoes with nails allowed horses to become the main draught animals used.



Simple machines

The first machines were the result of the search to find a way of doing work with less effort.

The principles of the lever, the wedge, the pulley, the crane, the winch and the screw were used in a variety of productive activities.

APPLICATIONS

ANIMAL POWER AND AGRICULTURE

Working animals were an essential element in farming until the dawn of mechanisation.



Oxen were the first animals used to do hard work in the field as, though slow, they are strong and peaceful.

The horse and, above all, the mule and the donkey began to replace oxen during the 11th century, as the introduction of the harness and the horseshoe allowed all the useful force of these animals to be utilised.

ANIMAL POWER AND TRANSPORT

Horses and mules, the main form of land transport until the 20th century.



Whilst roads were in bad condition, goods were generally transported on the backs of animals.

The cart was the result of the application of knowledge of animal traction and the wheel. In Catalonia, its use as a means of transport began in Roman times and continued with few variations until the introduction of the motorcar accelerated its disappearance.

ANIMAL POWER AND MOTIVE FORCE

Throughout history, animals have been used for a wide variety of transformation activities Flour mills, clay



mills, saw mills, grinders, mining, bread-making: these are just a few of the activi-

ties in which animals were used as engines.

The earliest evidence of the use of animals to move machines dates back to Classical Greece.

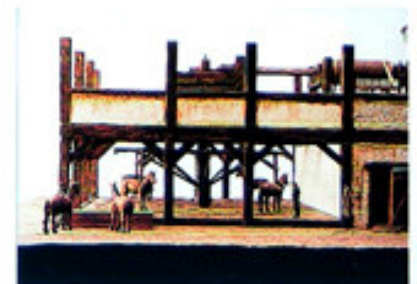
The Catalan ass, a species in danger of extinction

The Catalan ass, probably introduced by the Phoenicians, has gained great prestige over the centuries due to its corpulence and strength. Used to obtain hybrids (mules) and as a draught animal.

The race has now degenerated and, due to the little use to which it is put, is in danger of extinction

ANIMAL POWER AND MOTIVE FORCE

The first mechanised industry also made use of animal labour



In Catalonia, at the beginning of the age of mechanisation, many textile factories used animals to move shafts and drive machines. Reserve animals had to be kept as their need for feeding and resting made continuous operation difficult.