CLOCKWINDING 2005

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CLOCKWINDING

Historical context

WHAT - is the significance of clocks

WHY - did clockmaking lead to development of steelmaking processes

WHICH – were the major developments in steel and wire

HOW - do we use these processes today

WHEN did these historical developments occur

WHERE do we go in the 21st century

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Historical context

Hooke's Law, 1660

Huygen's invention of the pendulum clock and hairspring, 1665

Huntsman's crucible process for steelmaking, 1759

Invention of accurate chronometers, 1760s

Patent process for wire, 1854

Gift of clock by UK to WAI, Connecticut, 1947

21st Century – a post industrial age for UK and USA industry?

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Historical context

Robert Hooke, British physicist

Hooke's law, 1660

Load is proportional to deflection in wire

The area under the load/ deflection graph is a measure of the energy stored

A spring is a device for storing energy in the form of elastic strain

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Historical context

Christiaan Huygens, Dutch physicist, 1665

Invention of the pendulum clock

Invention of the hairspring – disputed by Robert Hooke who also claimed this invention

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Historical context

Benjamin Huntsman, Clockmaker from Doncaster

Couldn’t make a good living because quality of blister steel was so poor and variable.

Moved to Sheffield and after much trial and error experimentation invented the crucible process for steel manufacture, 1759.

Abandoned clock making because he could make more money selling steel for armaments and cutlery.

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Historical context

Invention of accurate chronometers, 1760s

Enabled accurate navigation around the globe

Hence enabled Europeans to arrive in Connecticut in a systematic rather than random way. Allowed discovery of Australia.

Eventually enabled Americans to help Britain

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Historical context

Invention of the process for patenting wire, 1854

Invented by Webster and Horsfall in Birmingham, England and still being used today.

The most important process for producing spring, reinforcing (for concrete) and bridge wire, then and now.

Stainless steel discovered by Harry Brearley in Sheffield, 1913

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Historical context

Gift of clock by UK to WAI, Connecticut, 1948

It's a pendulum clock. It has springs made from steel.

It says thank you to Americans for help in the second world war in which American's equipment was maintained using crucible steel, which was still being made at that time.

A most appropriate gift

Institute of Spring Technology founded, 1948, The world's only laboratory dedicated to springs.

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Historical context

Today there is a ceremony of clockwinding

WAI and IST are similar international organizations whose common goal could be expressed as

“to serve the technical, manufacturing and business segments of the global wire, spring and cable industry’ ”

Closer co-operation opportunities should be sought

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Historical context

Is the 21st century the dawn of a post-industrial age in UK, USA and other developed countries?

China, India, Korea and Eastern Europe are becoming the industrial nations.

There will be an on-going need for springs made from steel wire, for clocks and all other manufactured goods.

Inventions and patents will continue to be the future.

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