AfterImage

Generation of light, phenomenon of fluorescence
And our relationship with colour

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despite knowing about electricity for 1000s of years, we
remained in near darkness until Humphrey
Davy invented the electric light

ever since the first bright spark
discovered fire, the recipe for light
has been one of culture’s
most alluring quests

The scientific study of colour vision starts with
Newton’s great work, the Opticks:

using a large prism, Newton split sunlight into
the colour spectrum

he realised it was in fact our interpretation of
this light that defined colour
Fluorescence

is the non-persistent, instantaneous emission of light stimulated by absorption of energy such as UV, visible light or microwaves.

Francis Hauksby noticed a fluorescent glow from the residue of mercury whilst handling a broken thermometer quite by chance he had stumbled upon the principle of fluorescent tubes.

The charismatic electro-chemist, Humphry Davy, turned electricity from a curiosity to part of everyday life.....

...he invented the carbon arc, the first electrical device many had ever seen.

The first electric light emitted a harsh glow described by Robert Louis Stevenson as 'nightmare light'.

'such a light as this should shine forth only on murders and public crime or along the corridors of lunatic asylums, a horror to heighten horror'
Phosphorescence

is the persistent emission of light after exposure to energy such as UV, visible light or microwaves

Swan and Edison brought light to every household with the light bulb

newspapers likened the quality of the new light to: 'the mellow sunset of an Italian autumn'

Edison promotes the presidential campaign using a horse-drawn dynamo in the 'Electric Torchlight Procession', 1884 New York

Edison advocated the use of direct current (DC) for the national power grid

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electrocuting a (rogue) elephant, Thomas A. Edison, 1903
the understanding of static electricity underpins the workings of the fluorescent light

the Wimshurst machine is regarded as the most efficient man-powered static generator and is used throughout the world

millions of electrons jump across the balls, creating a huge amount of heat which causes the brilliant spark

neon, a colourless inert gas, except.....

at the flick of a switch, light is emitted as electrons collide with neon particles

when it emits a characteristic red light, other gases emit different colours

electricity, magnetic fields or microwaves can excite mercury vapour in the fluorescent tube, emitting UV, which causes the characteristic light to be produced from the coating inside the tube

fluorescent tubes lit by electric fields from a Tesla coil
**bioluminescence**

light produced by a chemical reaction within an organism

green fluorescent protein (GFP) has existed for more than one hundred and sixty million years in jellyfish

now GFP is found in laboratories all over the world where it is used in every conceivable plant and animal

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**bioluminescence**

regarded as the microscope of the twenty-first century, 'lighting-up' cell biology too small to be normally seen

used to investigate many diseases such as cancer, Parkinson's, Alzheimer's as well as congenital and developmental abnormalities

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our understanding of how the brain works was revolutionized by the development of Magnetic Resonance Imaging (MRI)

**Functional MRI allows us to see the brain at work**

here the visual cortex 'lights up' (orange) when looking at coloured pictures
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for more information visit www.machinehouse.co.uk