Intellectual Property: *Catalyst or Contaminant?*

Science and the Economy

Ian Harvey

July 9, 2013

v3 screen

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A patent gives you the right to use your invention

True or False?

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Should a researcher undertake a patent search before starting research?

Yes or no?

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Actress – “Ekstase” - 1933

What did she do that affects all your daily lives?

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“Future competition in the world is competition in <u>IP</u> ….”

Who said this – and why should we take note?

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Erbium-doped fibre amplifier

What does Prof David Payne, FRS, think about IP?

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John Roebuck

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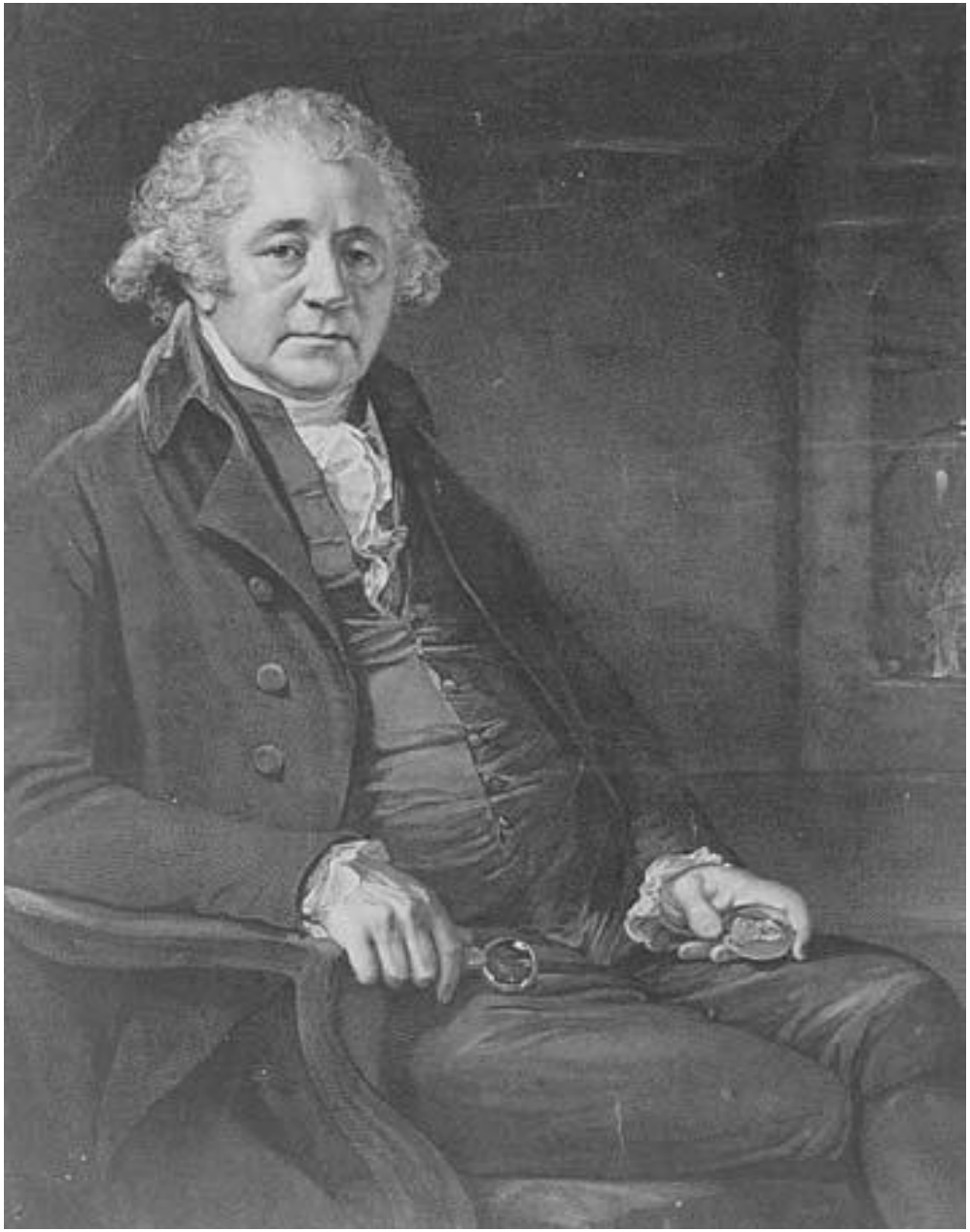

Matthew Boulton

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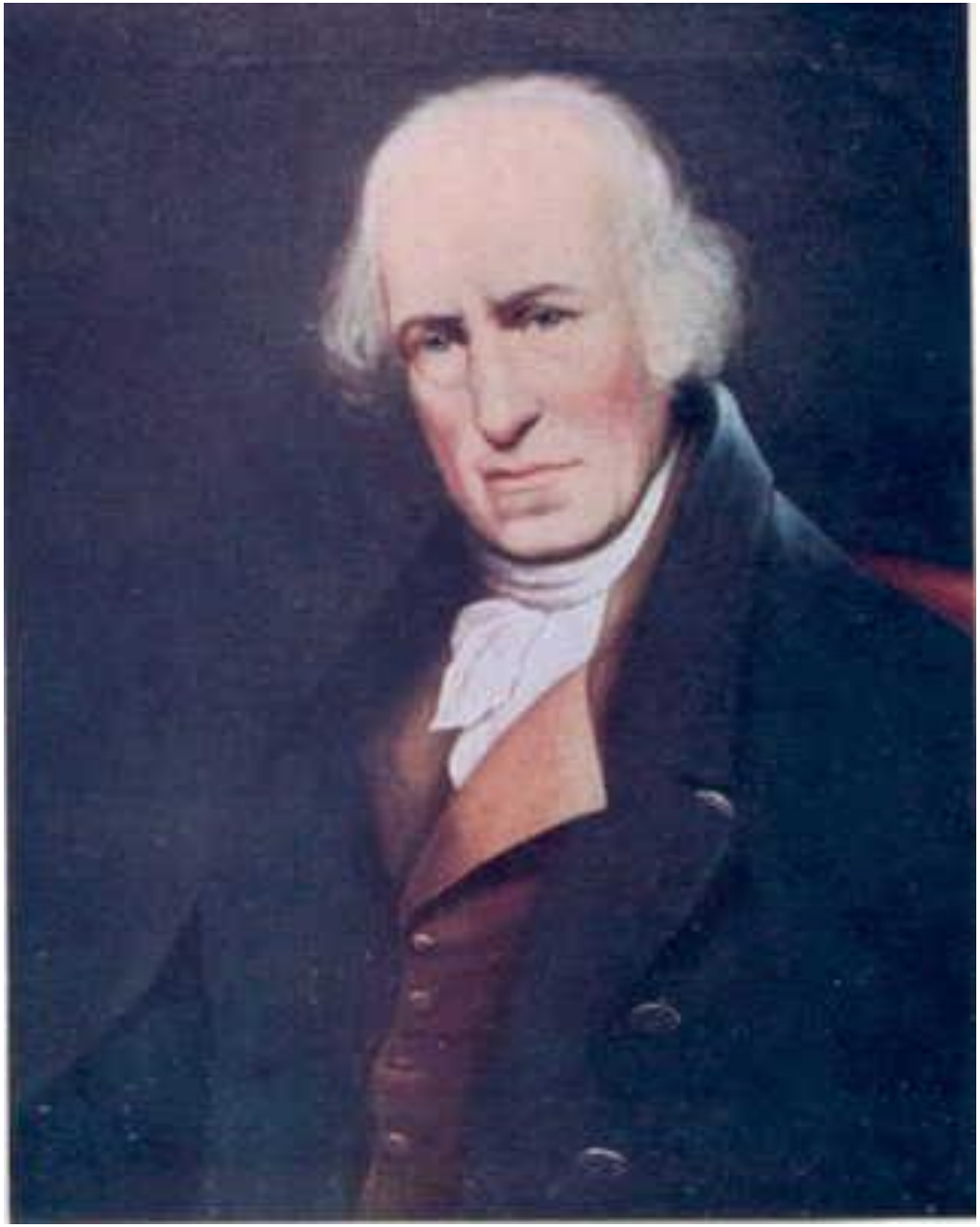

James Watt

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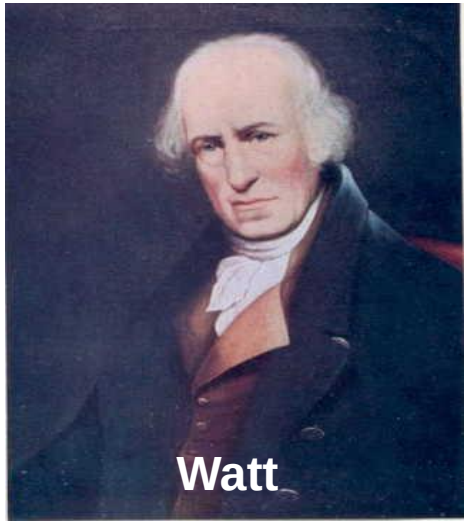

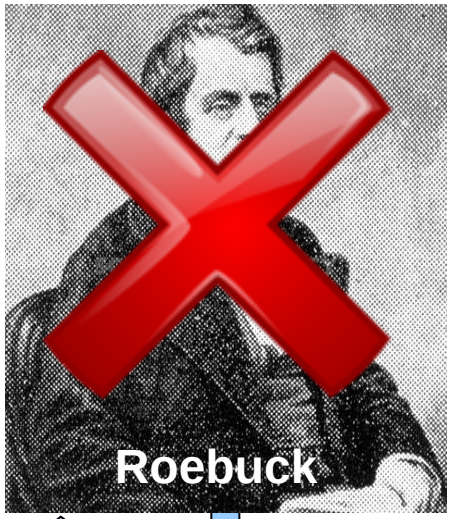

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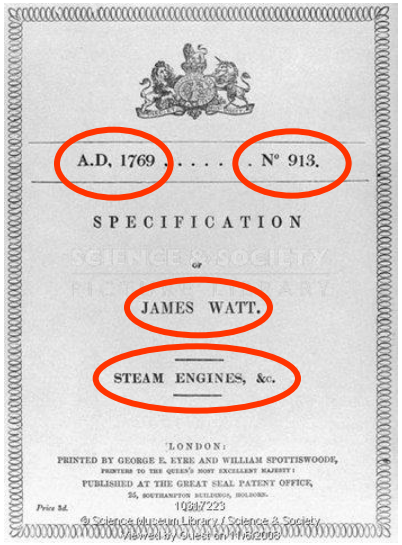

A.D, 1769 . . . . . N° 913.

SPECIFICATION

OF

JAMES WATT.

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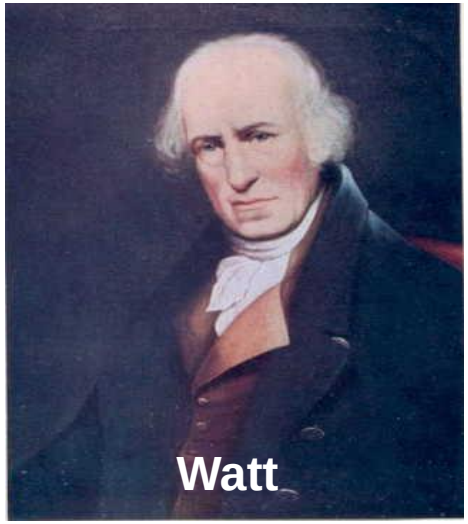
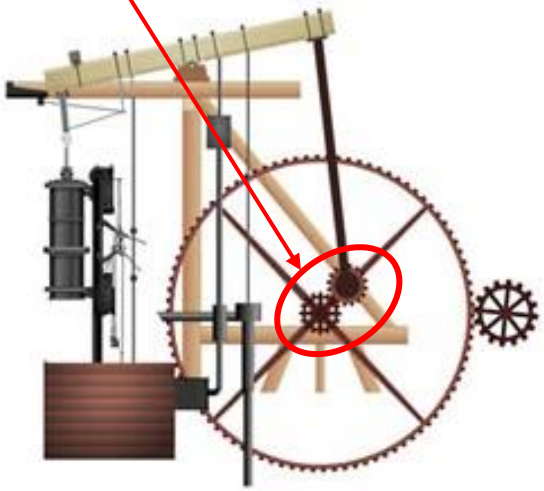


Sun and Planet drive avoids Pickard patent



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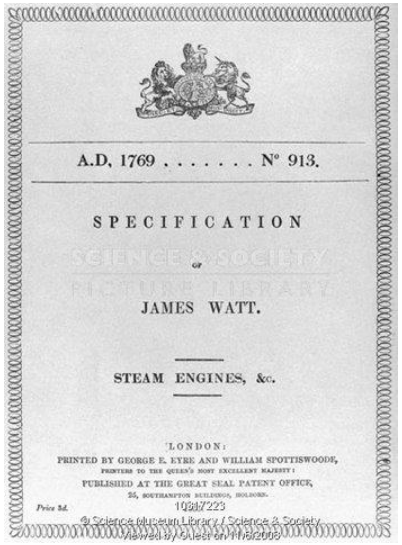

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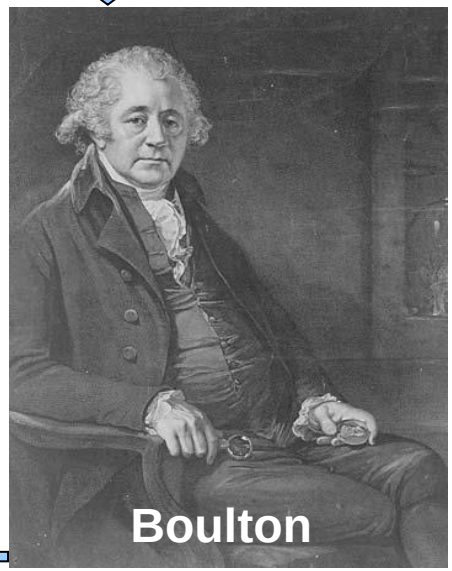

££

Extended from 14 to 30 Years

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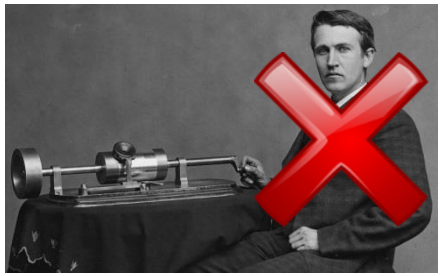
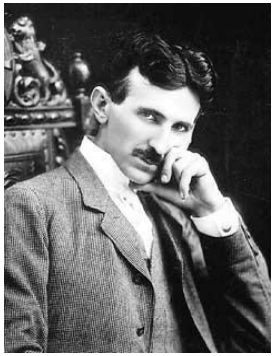
The Electrical Revolution – *AC* vs *DC*

Direct Current



Thomas Edison

Alternating Current



Nikola Tesla

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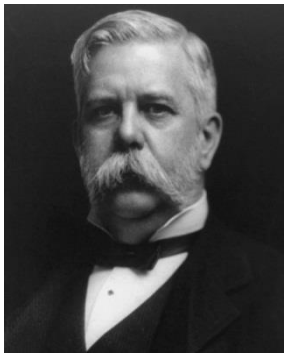


George Westinghouse

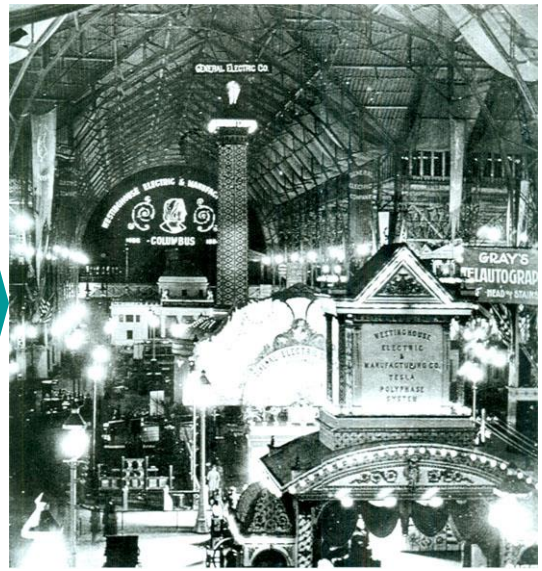
Patents

Open Innovation

Investment

Litigation

Chicago World's Fair 1893



Westinghouse Tesla Polyphase System (AC)

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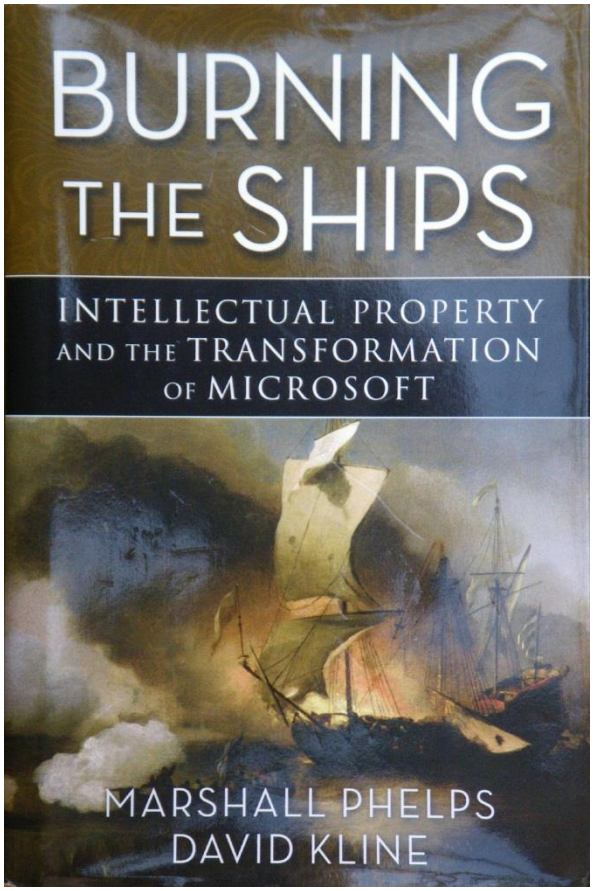
The Software Revolution - Microsoft

- **Bill Gates understood IP**
- **Microsoft built on copyright**
- **Then software patents**
- **IP is the "Bridge to collaboration":**
  - **Collaborations:**
    - **2003 = 0**
    - **2009 = 500**
  - **Partnering with Open Source**



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Lessons from 250 years

- **The inventors and heads of these successful companies (Watt, Boulton, Tesla, Westinghouse, Gates) understood IP very well**
- **IP was essential to raising finance for developing their ideas**
- **Most researchers and heads of companies today do <u>not</u> understand IP well – they leave it to their (often non-commercial) IP specialists**
- ***You are more likely to succeed if you are IP-literate***

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Even the Royal Society understood

(1) Numb. 1.

PHILOSOPHICAL
TRANSACTIONS.

Munday, March 6. 166⅘.

The Contents.

An Introduction to this Tract. An Accompt of the Improvement of Optick Glasses *at* Rome. *Of the Observation made in* England, *of a Spot in one of the Belts of the Planet* Jupiter. *Of the motion of the late* Comet *prædicted. The Heads of many New Observations and Experiments, in order to an Experimental* History of Cold; *together with some* Thermometrical *Discourses and Experiments. A Relation of a very odd Monstrous* Calf. *Of a peculiar* Lead-Ore *in* Germany, *very useful for Essays. Of an* Hungarian Bolus, *of the same effect with the* Bolus Armenus. *Of the New* American *Whale-fishing about the* Bermudas. *A Narative concerning the success of the* Pendulum-watches *at Sea for the* Longitudes; *and the Grant of a* Patent *thereupon. A Catalogue of the Philosophical Books publisht by* Monsieur de Fermat, *Counsellour at* Tholouse, *lately dead.*

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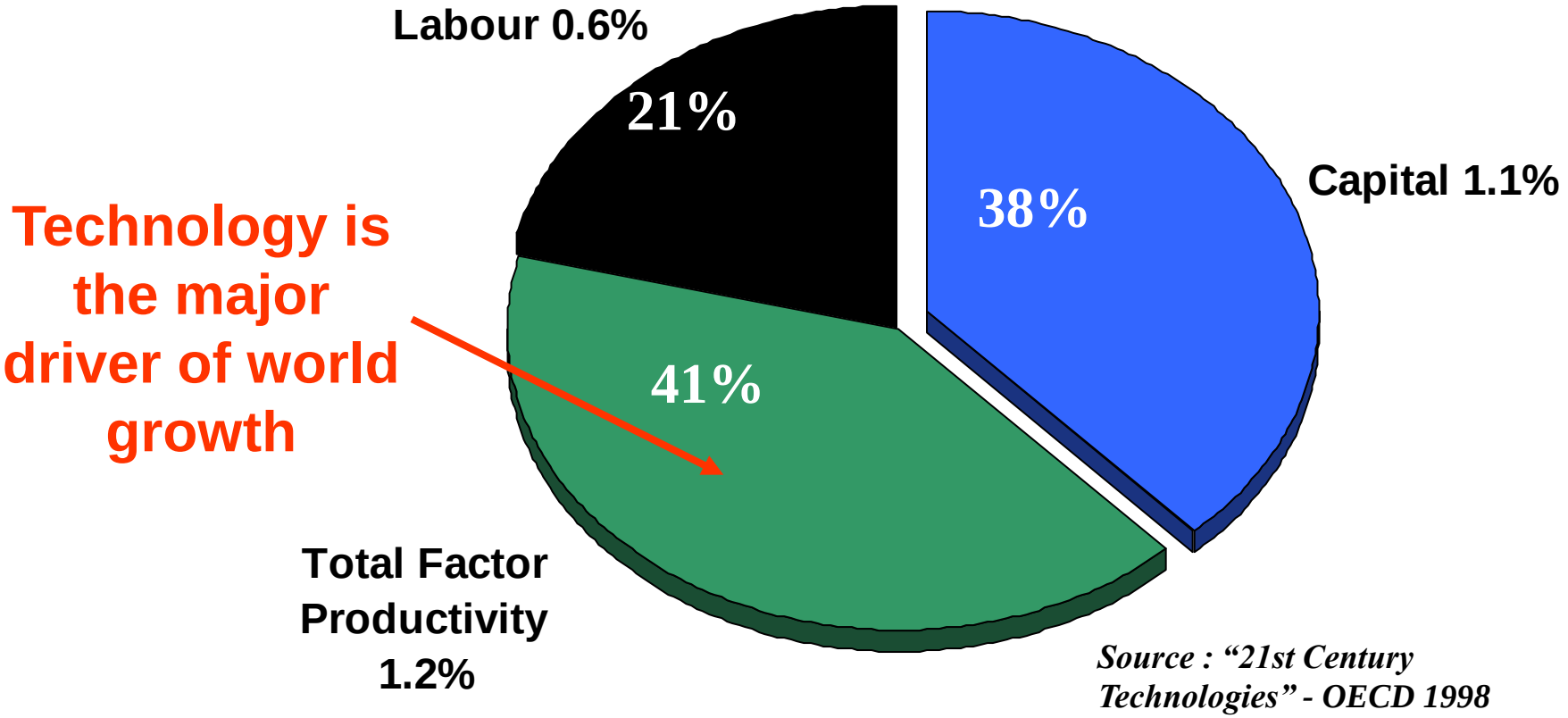
Impact of Technology on GDP Growth
1970-1990 Average 2.9%



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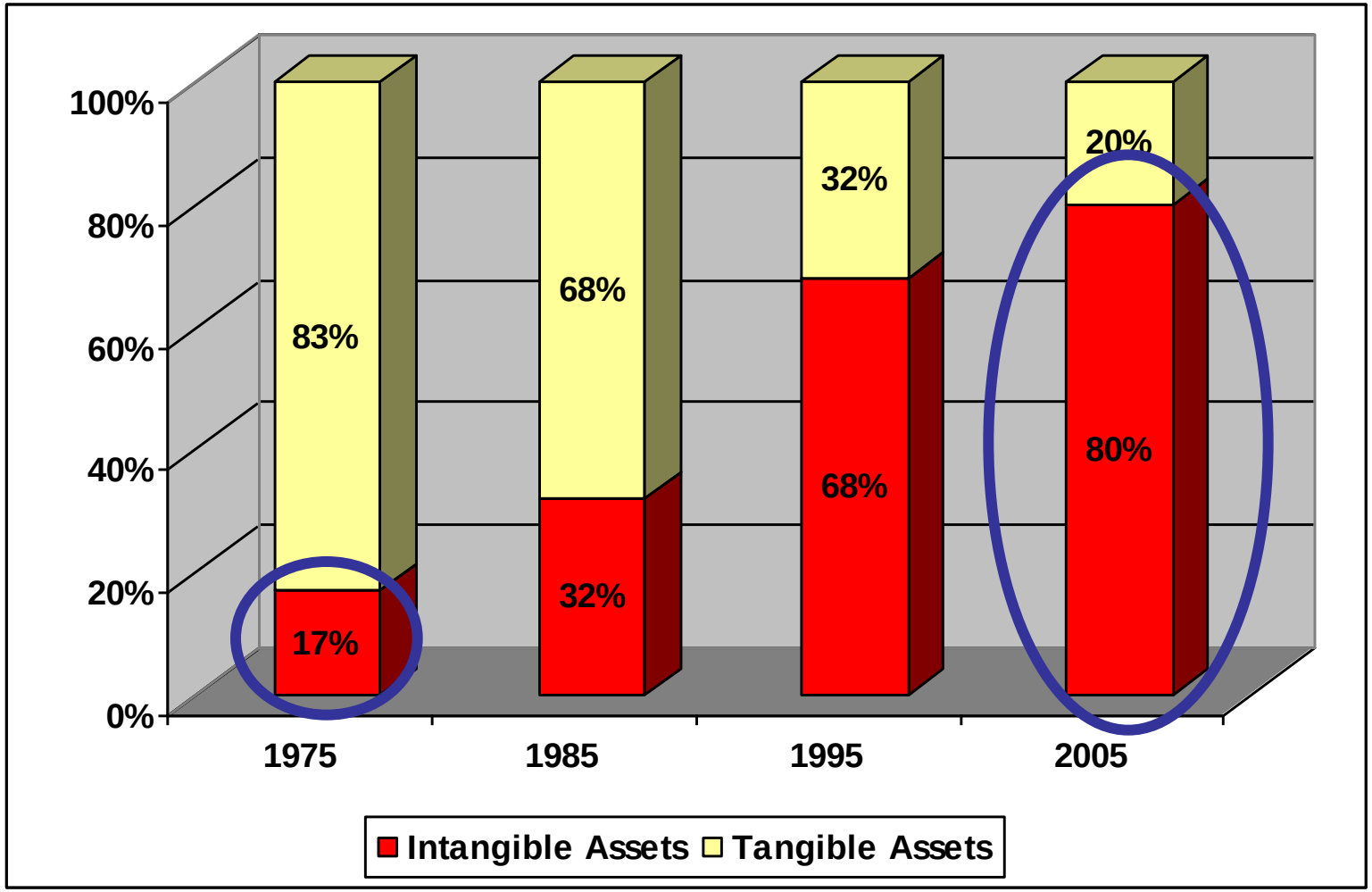
US Corporate Valuations: S&P500®



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IPRs provide:

- **The incentive to innovate and invest in risky new ideas**
- **The legal clarity and certainty for technology transfer transactions – including creation of IP pools – they are enforceable in court**
- **The choice to IPR owners how their IPRs will be used**

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Copyright

- **70/95 years – simple & free**
- **international right, simple, zero cost, certain, use is simple**
- ***managing artistic works, databases, software***

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Brands, Trademarks & Origin

- **Last for ever – quite simple and cheap**
- **country specific, relatively simple and certain, cheap**
- ***promise of quality: creating and managing consumer loyalty***

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UCL- based research on DVTs*

Value from the UCL trademark

Deep Vein Thrombosis

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Ethiopia: Geographic Origin

ETHIOPIAN™
FINE COFFEE

Coffee varietals:

- ***Sidamo***
- ***Harar***
- ***Yirgacheffe***

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Patents are different ……

- **Patents:**
  - **Last for 20 years – can be complex and expensive**
  - **<u>Country specific</u> but <u>conditionality is global</u>**
  - **<u>Not an absolute right</u>: conditionality - must be "new" and "not obvious"**
  - **They can be exceptionally valuable, but they are complex and expensive to acquire and defend**
  - ***investing in innovative technology and products***

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A patent is a potentially valuable but uncertain and expensive right

- **Uncertainty:**
  - **a patent is not an absolute right:**
    - ***Novelty*: at any time new "prior art" from anywhere may invalidate patents everywhere**
    - ***Obviousness*: courts may decide it was "obvious"**
- **Expensive if international:**
  - **$250k lifetime for international patents**
  - **Enforcement: Germany $100k, UK $500k, US $5m, 2 – 7 years (China $20-120K & 2-14 months)**

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What does a patent do for you?

- **It gives you the right to *stop other people* from making, selling or using your invention commercially**
- **A patent does *not* give you the right to use your own invention!**

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Does a patent ……

- *confer ownership of the technology - the "ownership of life" issue?*
  - **No - patenting is a passive right - - a patent allows you to stop someone else using your invention, it does not confer ownership of the technology or the right to use it**
- *keep things secret?*
  - **No - a patent puts the invention into the public domain**
- *last for ever?*
  - **No - a patent ends 20 years after filing the application**
- *constrain research into the patented area?*
  - **No - patenting does not prevent research except, possibly, in the US**

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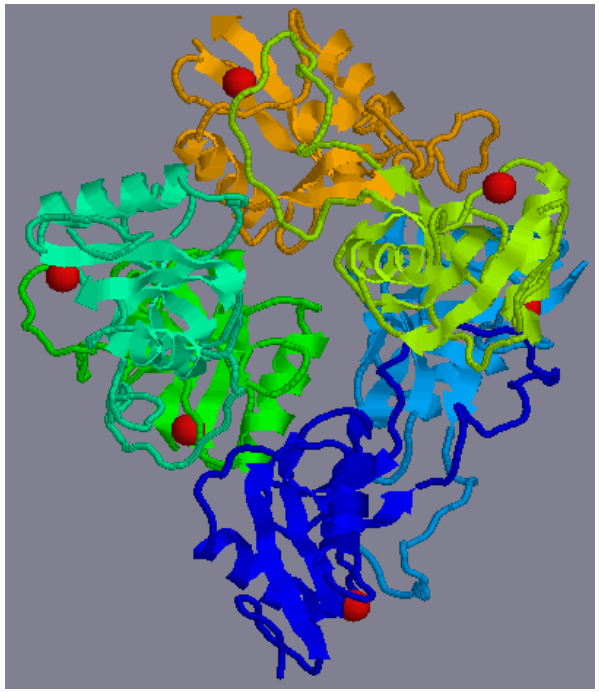
Factor IX *George Brownlee, Oxford*

Treatment for haemophilia B

- **Sequencing the F IX gene**
- **Two independent IP sources**
- ***IP uncertainty – no one developing***
- **Strategy:** ***Brought together IP from Universities of Washington State and Oxford***
- **Result:**
  - **Licensed Genetics Institute (AHP) and five others**
  - **BTG BeneFIX revenues £11.4 million p.a.**
  - **Licencees developing gene therapy applications via different vectors**
- **Treatment for 13,000 haemophiliacs worldwide**



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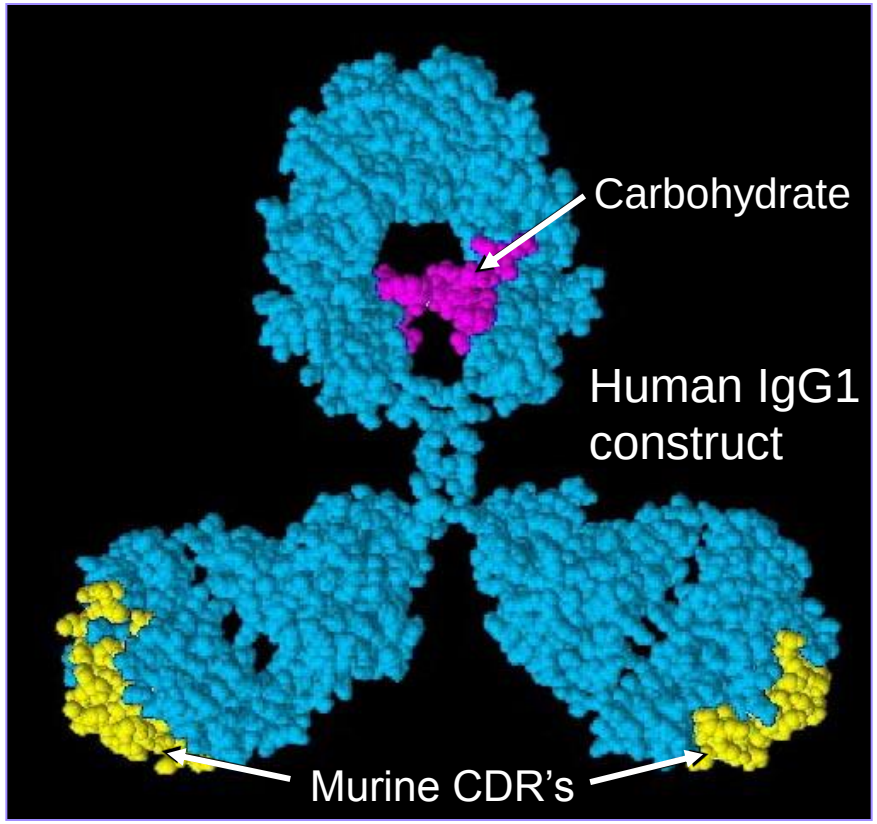
Campath® *Herman Waldman, Cambridge*

- **humanised monoclonal antibody directed against the CD52 antigen - 1983**
- **depletes immune cells implicated in variety of auto-immune related disorders**
- **reverses or halts progression of CLL by depleting the malignant B cells associated with the disease**



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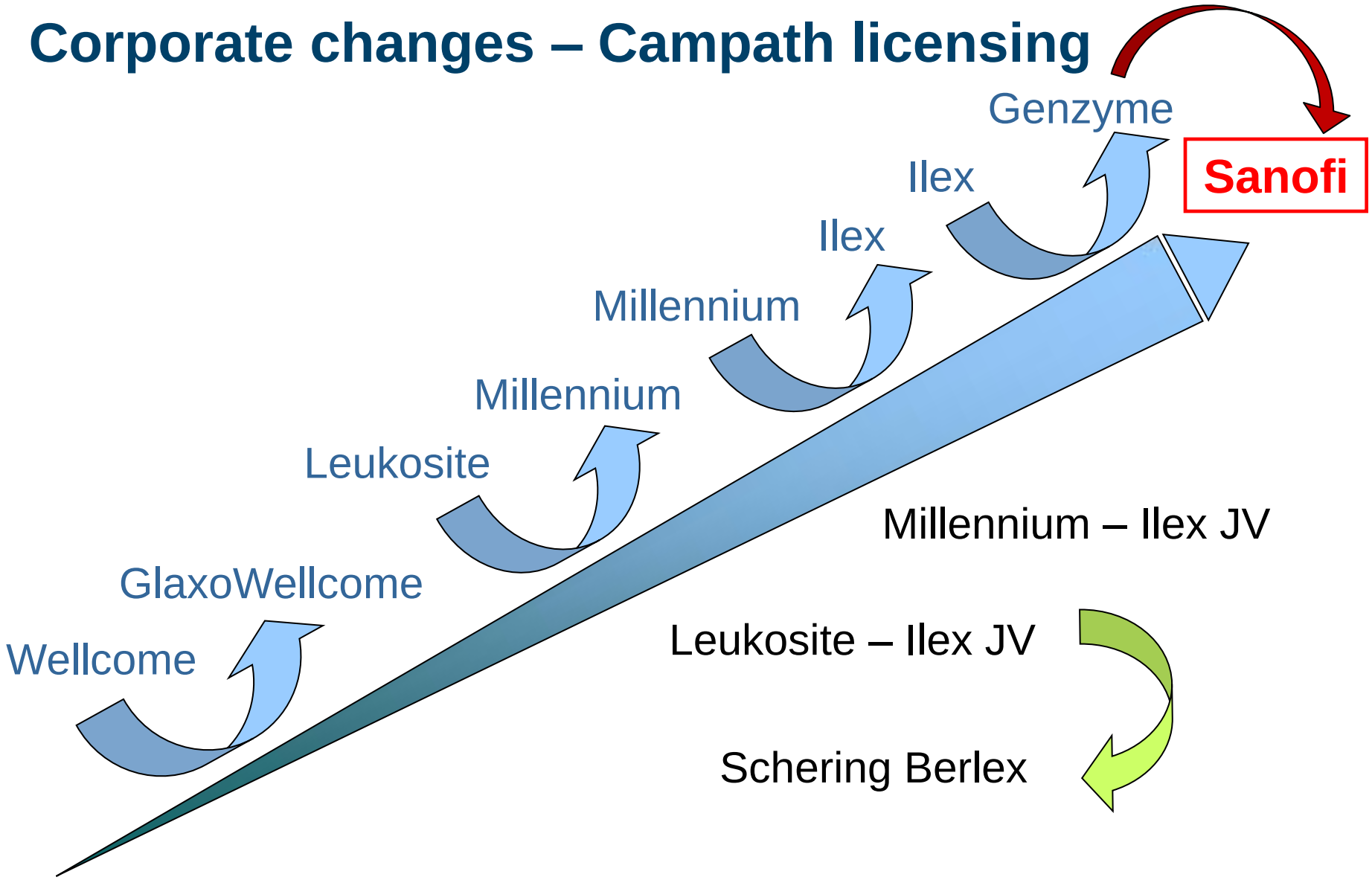
Corporate changes – Campath licensing



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Development comes full circle

Campath 1H → ***Alemtuzumab*** → ***Lemtrada***

Chronic Lymphocytic Leukemia (2001)

Rheumatoid Arthritis (early 1990s)

Multiple Sclerosis (remitting–relapsing) (2013?)

2015+?

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Magnetic Resonance Imaging (MRI)

Peter Mansfield, Nottingham

- **BTG & MRC funded development of technology from 1974-1980 from Nottingham and Aberdeen Universities**
- **BTG combined the IP from three different universities creating a true technology portfolio**
- **Clinical equipment became available in 1983 and was in clinical use in 1985**
- **Between 1986 and 1989 99% of the world's MRI manufacturers were licensed including GE, Marconi, Siemens, Toshiba, Hitachi and Shimadzu, Bruker, Fonar and Esaote.**

2003 Nobel Prize for Medicine: Sir Peter Mansfield

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Big Pharma as a Catalyst for Change

- February 13, 2009 Speech to Harvard Medical School – Andrew Witty, CEO

In a speech titled "Big Pharma a Catalyst for Change," CEO Andrew Witty set out an ambitious new agenda to tackle the challenges of improving global public health. In summary, Witty said:

- The task before us is huge. Africa, for example, has 34 of the 50 poorest countries in the world and suffers 24% of the global disease burden.
- To tackle the problems before us we need to scale up our existing commitments. But that alone will not be enough. We need to develop new partnerships and new approaches. We need to adopt a new mindset, one which is more innovative, open-minded, flexible and willing to take risks.
- Today we are setting out four commitments:
- First, a more flexible approach to IP in the Least Developed Countries. IP's primary objective is to incentivise and reward research. However, there are plenty of neglected tropical disease where there is a severe lack of research. We need to see if we can use IP to help address that gap. One idea we are proposing is a Least Developed Country (LDC) Patent Pool for medicines for neglected tropical diseases. We would put our relevant small molecule compounds or process patents for neglected tropical diseases into the pool, allowing others access to develop and produce new products. The pool would be voluntary so as to encourage others to participate and any benefits from the pool must go in full and solely to LDCs.
- Second, on pricing. Today we are setting out a new promise: we will reduce our prices for patented medicines in the LDCs so that they will be no higher than 25% of the developed world assuming we can cover our cost of goods. This will be a maximum price – where possible we will go further and reduce our prices more aggressively. In middle income countries we will also be more flexible, so that prices reflect more closely a country's ability to pay.
- Third, on greater collaboration in fighting Diseases of the Developing World. GSK is fully committed to research into DDW. We have a dedicated research centre into DDW in Tres Cantos, Spain which employs 100 scientists funded in part by our partners - including Medicines for Malaria Venture and the Global Alliance for TB drug Development. However, globally research into DDW is still too fragmented, which represents a sub-optimal approach. We need to have much greater critical mass and partnership between the public and private sectors. For our part we are willing to open up, allowing partners in to our facilities if that helps create a truly world-class, global centre of excellence, not owned just by GSK, but by all of its partners whether they are governments, foundations or other companies
- Fourth, by looking at how we move from being a supplier of drugs to being a partner in delivering solutions. We need to stop saying "it's not our fault there is no infrastructure to deliver healthcare" and start saying "who can we work with to ensure that the infrastructure does exist?" To start with today we are setting out a new commitment in which 20% of the profit we make selling medicines in LDCs will be reinvested in infrastructure projects in the LDCs, benefiting the poorest people in the poorest countries directly. We need to do more. We never want to be seen just as a "Western" company. We need to be a local company

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How to screw up your idea ……

1. **Put it into the public domain "so everyone can use it"**

   Then no one will invest in its development

   BTG: numerous university researchers disclosed what they had done before patenting - destroying any chance of development

2. **Keep sloppy lab books – "*only I will read them*"**

   Then you cannot defend it in court – so no one will invest in it

3. **Be unaware of what others are doing in the field**

   So you will miss the collaboration or the company that could make it a success

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What you should do ……

- **Do a patent search yourself:**
  - **EPO: *http://worldwide.espacenet.com/?locale=en_EP***
  - **USPTO: *http://patft.uspto.gov/netahtml/PTO/search-bool.html***
- **Get expert professional advice**
- **Get the advice early:**
  - **Before you publish (in any form – even a lab poster)**
  - **Before you contact companies**
- **Create and identify your IP – facilitates collaborations**
- **Be prepared to share the benefits**

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A patent gives you the right to use your invention

False

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Should a researcher undertake a patent search before starting research?

Yes – one of the best sources of who is doing what research

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INTIPSA
International IP Strategists Association

“future competition in the world is competition in IP ….”

Wen Jiabao - Chinese Prime Minister
June 2004 et seq

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Tianjin (China) IP Education

- **Every primary and secondary school has an IP teacher**
- **Every child is taught about IP**
- **Why?**
  - ***"Because stealing IP is like stealing your intellect"***
  - ***"Because a modern economy depends on IP"***

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Actress – “Ekstase” - 1933

What did she do that affects all your daily lives?

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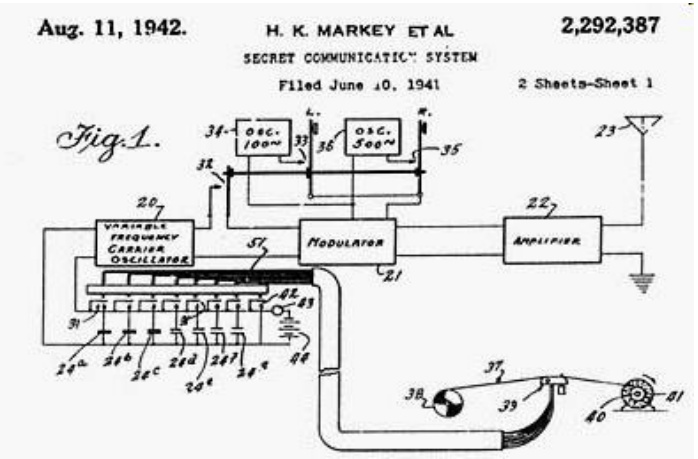
Hedy Lamarr: Inventor

Spread Spectrum Radio Technology



- **Actress – “Ekstase” - 1933**
- **Co-inventor (with Antheil) of Spread Spectrum radio technology**
- **US Patent No: 2,292,387 1942 (Lamarr-Antheil)**
- **Cited by over 1000 subsequent patents including CDMA, TDMA, GPS and 802.11 wireless internet (WiFi)**

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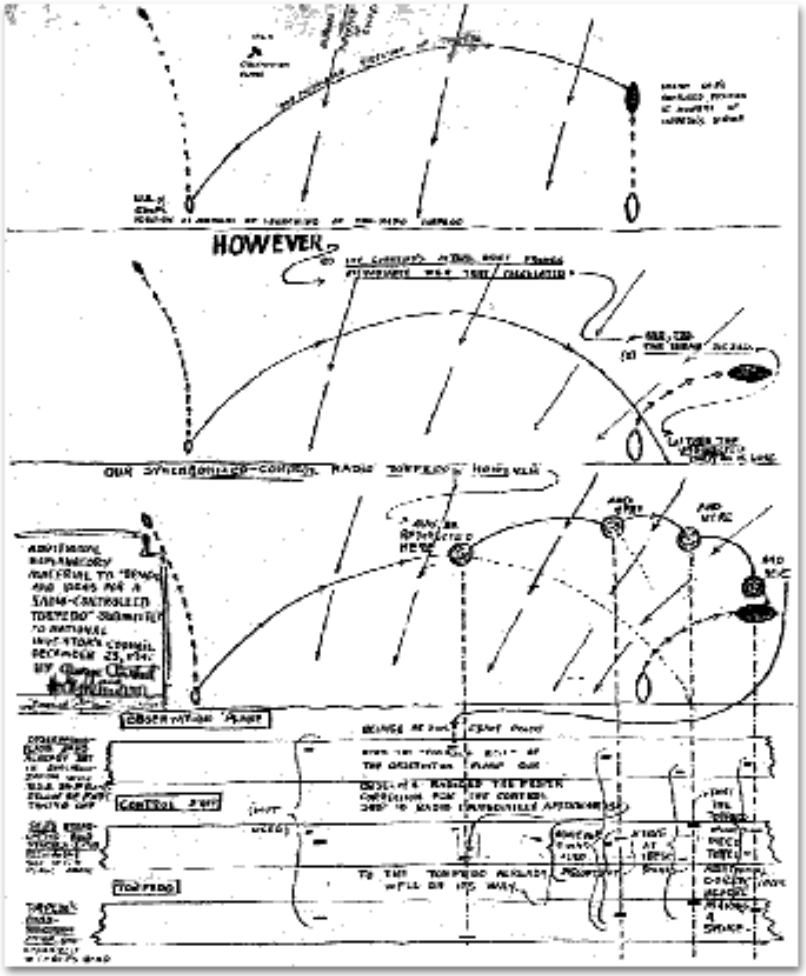
Lamarr-Antheil Spread Spectrum Patent

Disclosure



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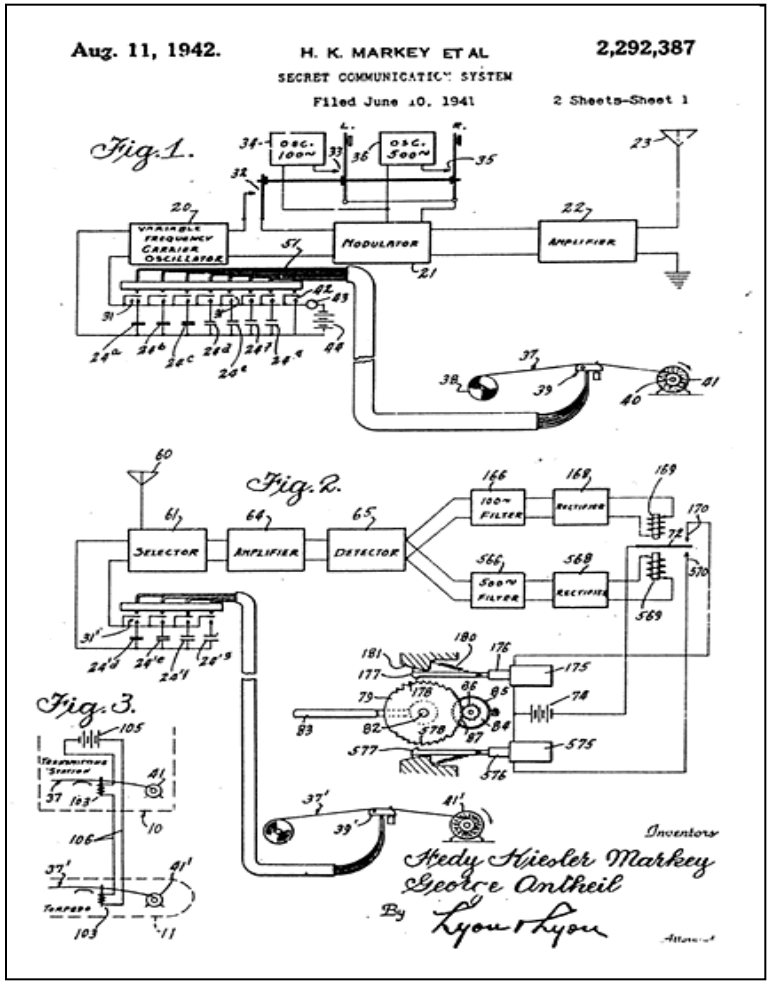

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David Payne – the last word on IP

- **Commercialization is important - the country/world does not owe researchers a living**
- **Patents important to commercialization – essential to spinouts/startups**
- **Need the best patent attorneys – often only industry can afford them**
- **File continuously but selectively**
- **Expect a "just" reward***

New products are 1% inspiration, 99% perspiration <u>and investment</u>

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Intellectual Property: *Catalyst* ~~*or Contaminant?*~~

Science and the Economy

Ian Harvey

July 9, 2013

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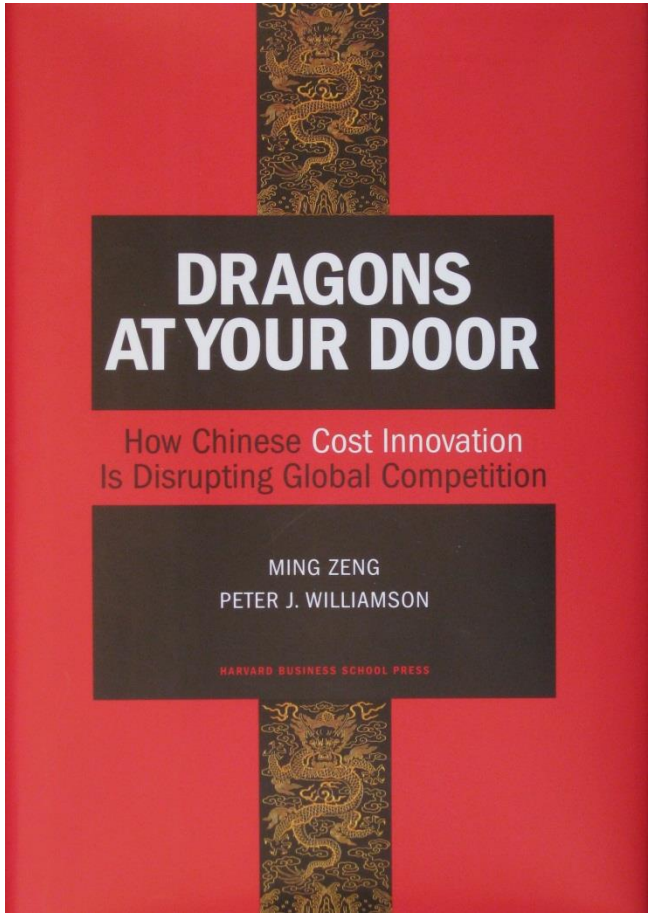
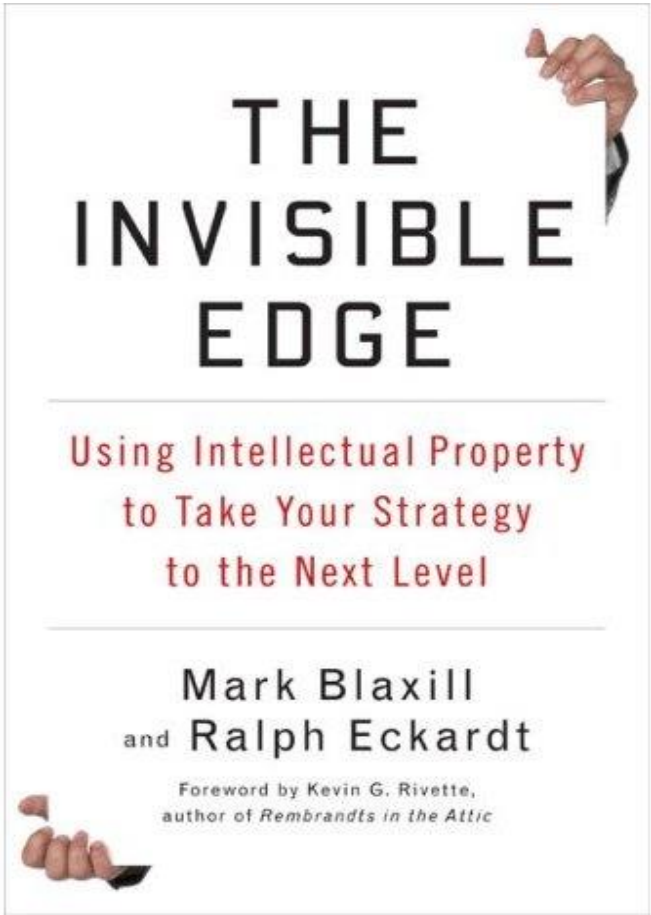
Further reading





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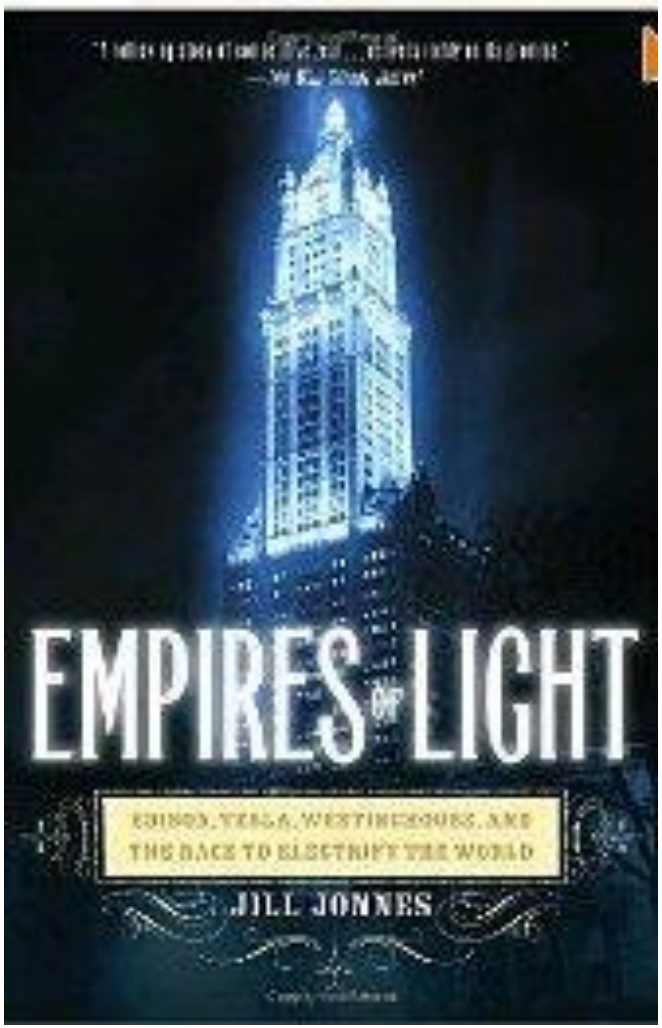
The AC/DC Electrical Revolution



“Empires of Light: Edison, Tesla, Westinghouse and the race to electrify the world” *Jill Jonnes*

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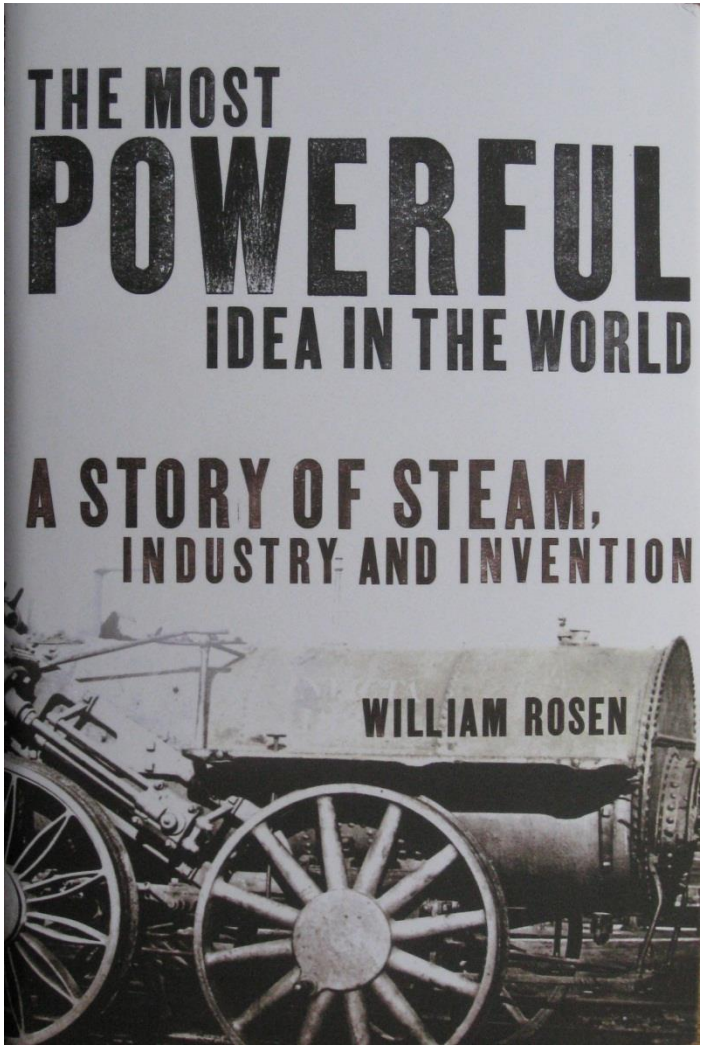
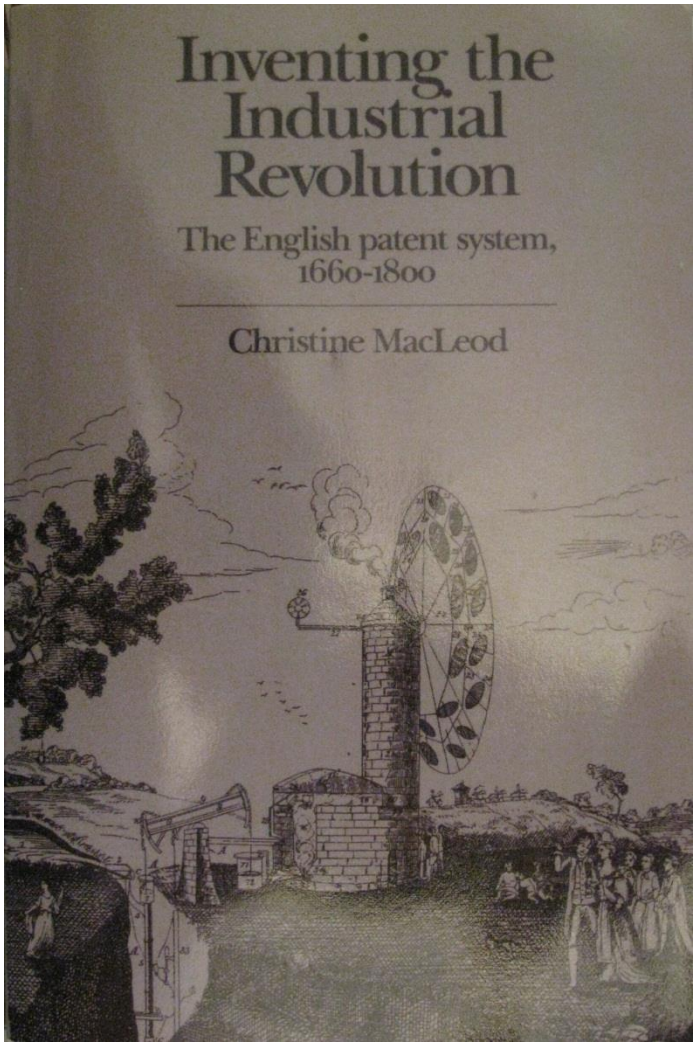
The Industrial Revolution

"Easy reading"



"Academic"



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