

# Developing an infrastructure to support innovation

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# Innovation.

## Why is Commercialization Important?

In the UK we have to keep justifying this!

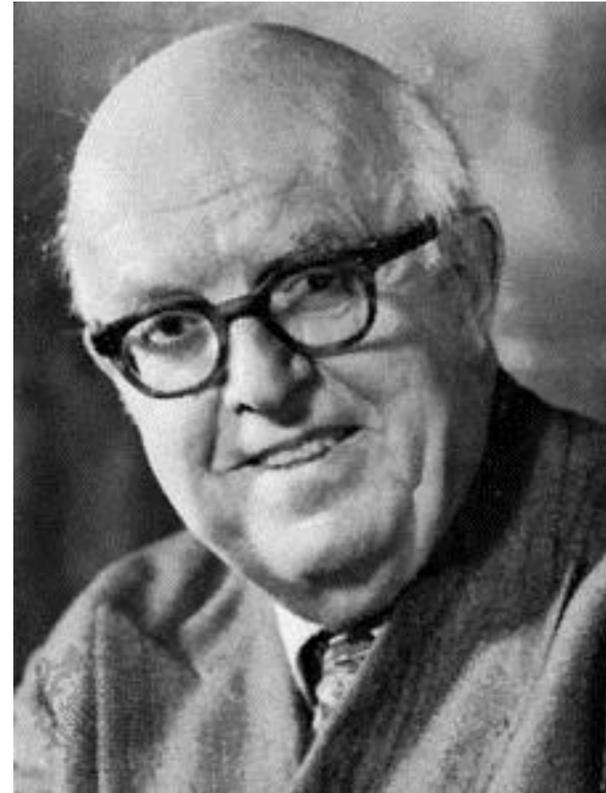
- Science has to pay a debt to society!
- Translation of scientific ideas is what drives new technology and products
- Innovation and how it works, with comments on culture and time gaps
- Further comments on Innovation

# Culture and timescales and barriers

- There is in the UK a large culture gap between pure science and technology/business/service
- There is a world-wide problem of time-gaps between the invention and the commercialisation or adoption of ideas!
- We must develop ways to overcome the culture gap and try shorten time-gaps.

# CP Snow recognised the science/technology gap in his 1959 “Two Cultures” Essay

- “I think it is fair to say that most pure scientists have themselves been devastatingly ignorant of productive industry...”
- “pure scientists and engineers often totally misunderstand each other”
- “pure scientists have by and large been dim-witted about engineers and applied science”
- “engineers have to live their lives in an organised community.....They are absorbed by making things....”



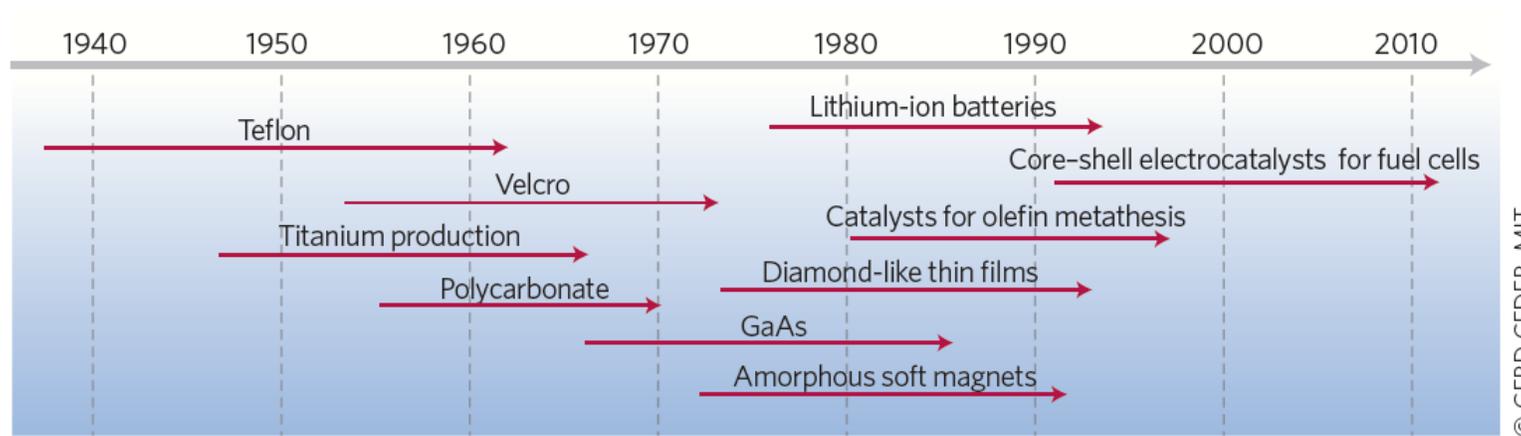
In the UK we still have a serious problem with this gap in culture right through society

# What is Innovation?

Note it is different from invention

- Invention happens and IP is created, Patents filed etc...
- The IP has to be converted into a business or a product: **this is the innovative step.**
- Managing innovation is a new and poorly understood topic.
- There are new models for Innovation, eg: “Open”, Frugal and more.....

# Examples of the Innovation Time Gap



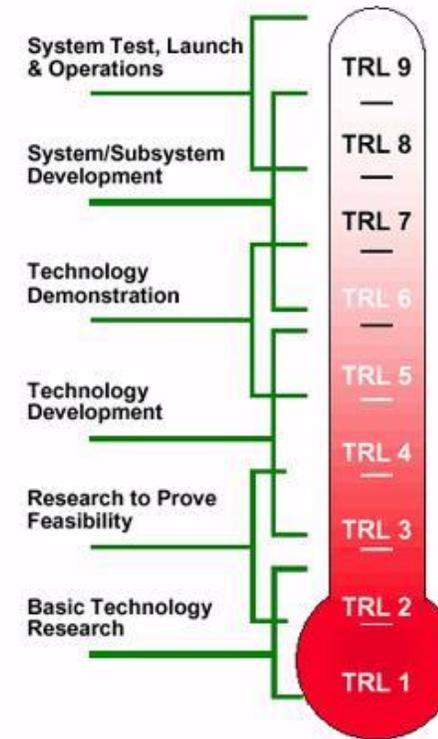
**Figure 1** | Time frame from discovery to application for a few technologically important materials.

From an Editorial comment in Nature Materials vol 12, 173 (2013) concerning the US Materials Genome project.

This time gap should not be as long as this for changes in practice or procedure

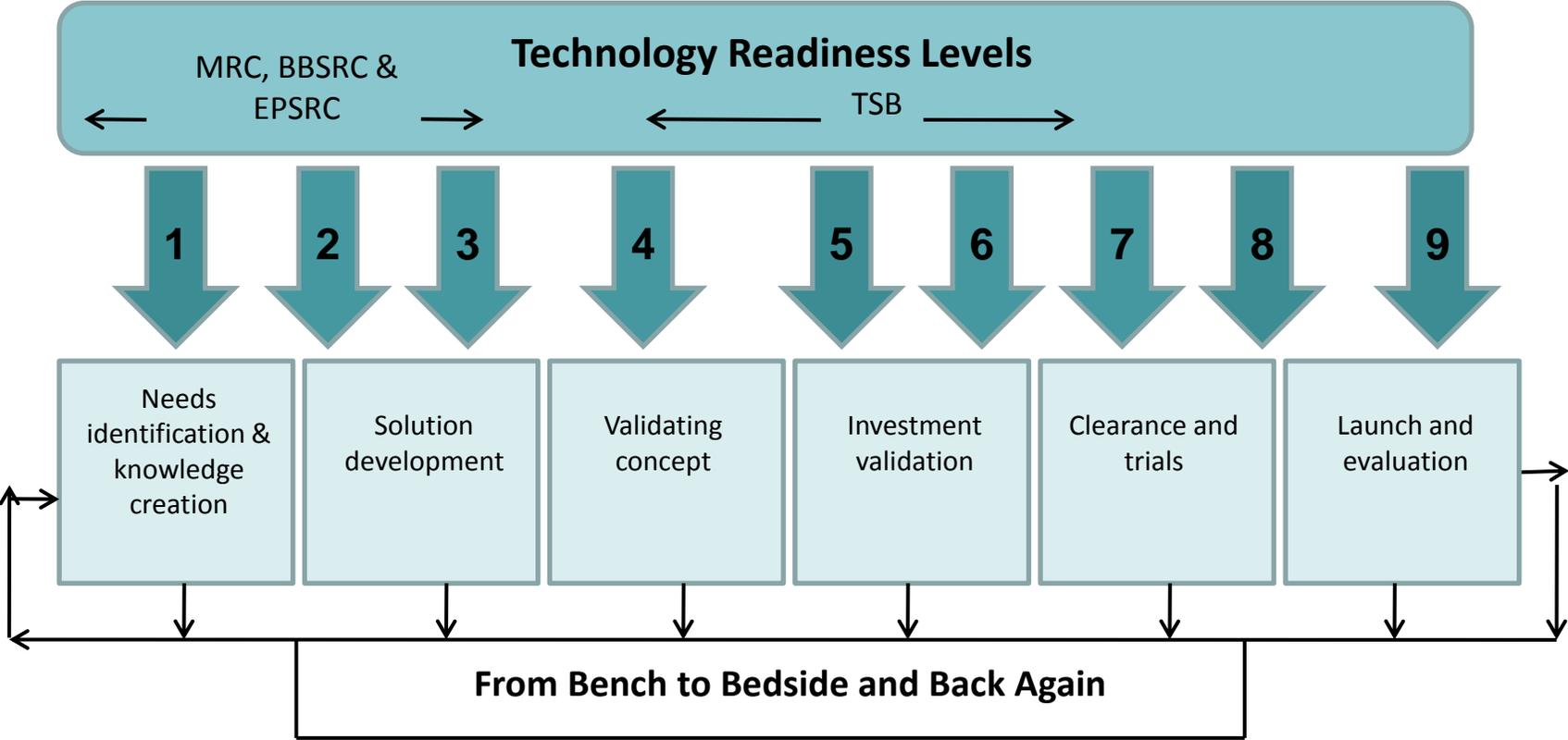
# Innovation Timescales and Technology Readiness

- The timescale for Innovation is typically 10-25 years, especially for making “stuff”!
- We make use of the NASA TRL scales now
- Research Councils fund up to TRL 2
- TSB funds TRL 3-5
- Horizon 2020 (EU) is intending to support TRL 5-8



# Healthcare TRLs

The NHS and others need to be more engaged with the process of taking new ideas into practice!



# Why is there a “Time Gap”

- Patents filed and substantiated
- Market assessment to establish a business case
- If a business case can be made: process and production issues addressed
- “scale up” may pose problems, and the real costs will emerge and it takes time to build factories and make things!
- Market may change for better or worse!
- In the service sector: “People do not like change”!

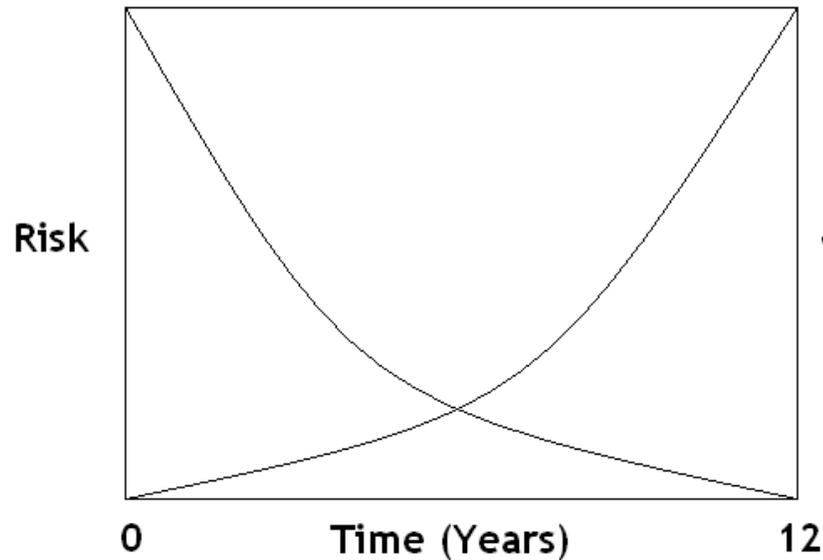
# The Time Gap

- Development takes longer than you think! It also costs around 10x research costs
- Is there a market/business to be had?  
Too many scientists ignore this
- Manufacture is capital intensive and it takes time.  
The skills are completely different from scientific research  
Costs for research: development: manufacture  
are 1: 10:100 and it might be larger

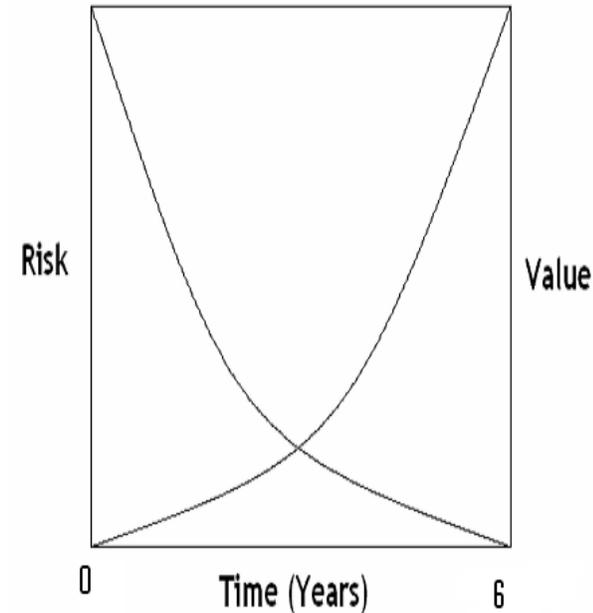
# Can we shrink the Innovation timescale for a project or small company?

This is a complex subject but one key to this is to establish the market needs and aim for early revenue generation

The "Usual" timescale



Value



Form partnerships with other companies

Use toll manufacturing

Use other companies to help sales/marketing

Are there lessons for the Healthcare Service Providers?

# How new Innovation practice can help the Healthcare sector

- Partnerships between Stakeholders to reduce all time-scales **Saving Time Saves Money!**
- More use of point-of-care diagnostics **Fewer appointments and more rapid treatment.**
- Stronger linkage between Universities, Colleges and the Healthcare providers.... **Health Innovation and Education Clusters (HIEC).**
- Make use of new Apprenticeships and Doctoral Training Courses
- Adopt ideas of “Open Innovation”

# Point-of-care diagnostics



MediSense (Abbott) fingerprick blood analysers for diabetes management, (invented in Oxford, made in Abingdon)



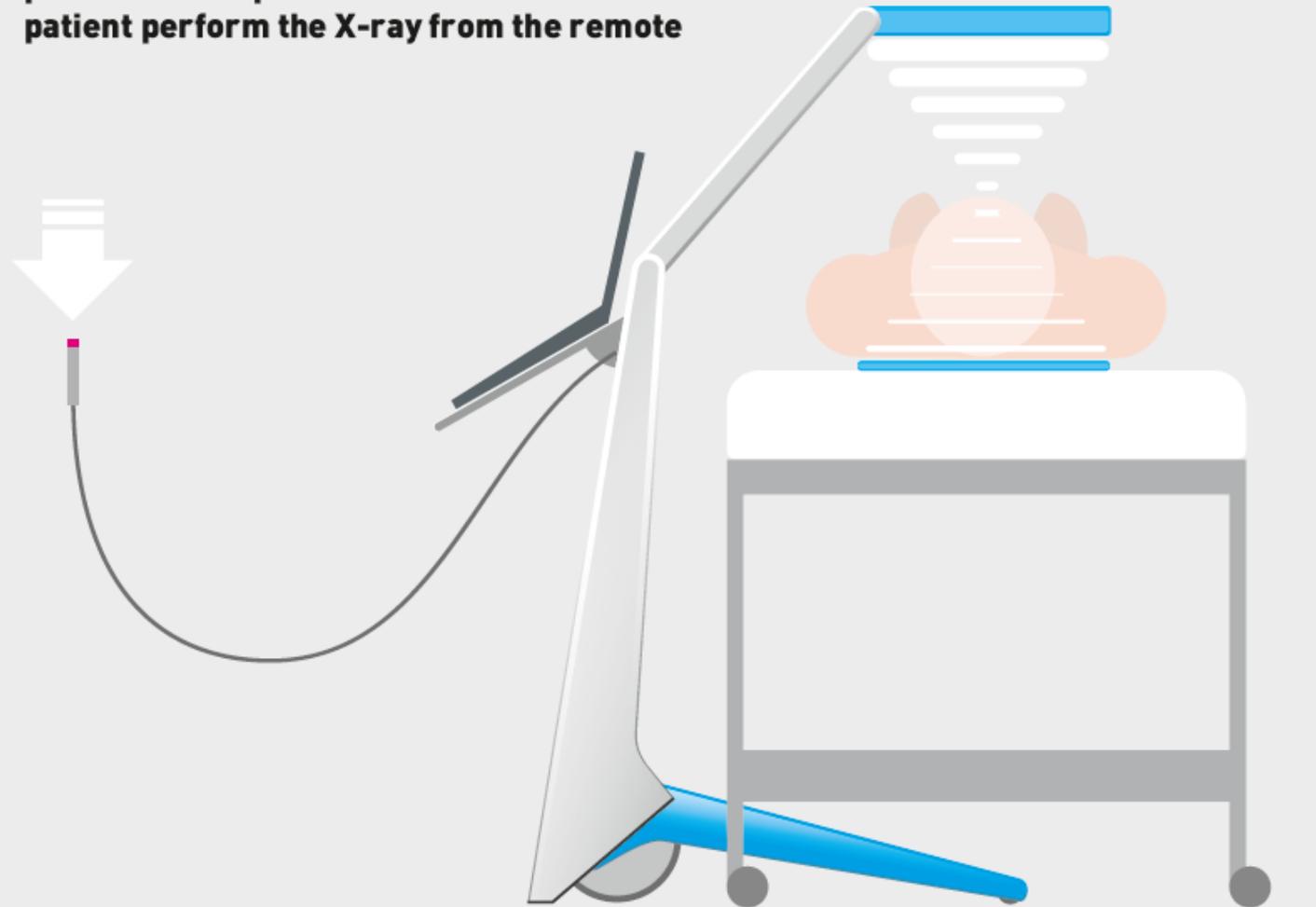
Miniature ultrasound scanner by Siemens.



Miniature DNA sequencer invented in Oxford and being made in Oxford

# Point-of-care diagnostics

**push the device in place**  
**place detector plate underneath the**  
**patient perform the X-ray from the remote**



A small portable x-ray unit to be used at bedside:

Radius Diagnostics Ltd

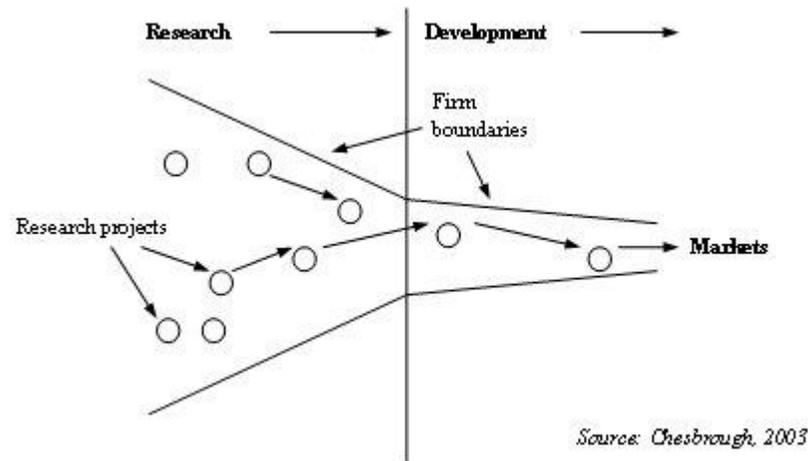
European Space Agency Business Incubator

Atlas Building, Harwell

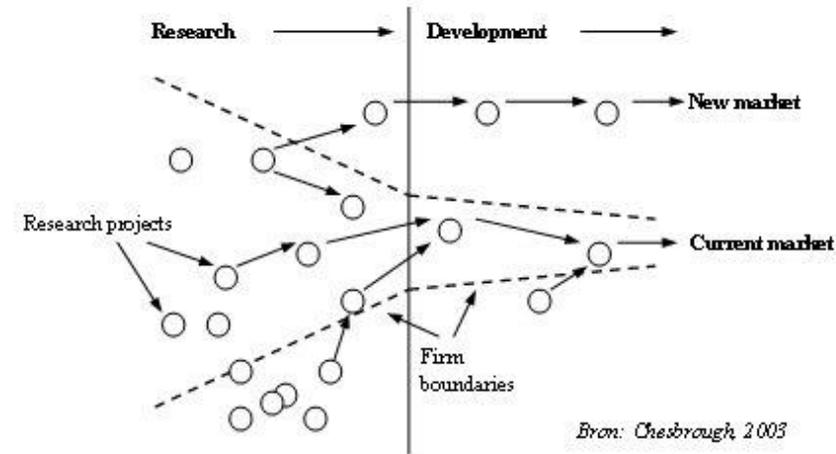
Oxfordshire, OX11 0QX, UK

<http://www.radius-health.com/Home.aspx>

# Closed vs Open Innovation the original concept diagrams



Large Corporations accepted that many ideas might not produce successful products, but “knowledge” was retained in the Company



Some companies such as Proctor & Gamble realised they needed to get ideas from outside of the organization....so they embraced the Open Innovation model

We should try to adopt this OPEN INNOVATION across Healthcare

# Summary

- There is the technology to improve innovation in healthcare
- There does need to be a more joined-up approach and less “silo mentality”
- More engagement across the disciplines and a deeper appreciation of the healthcare objectives is needed.