

Science?

Science consists of observing the world by watching, listening, observing, and recording. Science is curiosity in thoughtful action about the world and how it behaves. **NASA**

Science is the pursuit and application of knowledge and understanding of the natural and social world following a systematic methodology based on evidence. **Science Council**

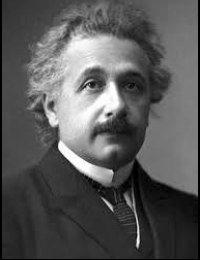
The careful study of the structure and behaviour of the physical world, especially by watching, measuring and doing [experiments](#), and the development of theories to describe the results of these activities. **Cambridge Dictionary**

Science is a systematic endeavor that builds and organizes knowledge in the form of testable explanations and predictions about the universe. **Wikipedia**

The Essential Processes of Science

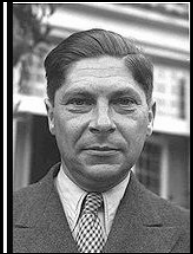
- *that knowledge claims and the evidence on which they may be based are made openly available to be tested against reality and logic through the scrutiny of peers*
- and*
- *that the results of scientific inquiry are communicated promptly into the public sphere and circulated efficiently to maximise their availability to all who may wish or need to access them*

The provisional nature of science



No amount of experimentation can me right. A single experiment can prove me wrong.

Albert Einstein?



The progress of science is strewn, like an ancient desert trail, with the bleached skeletons of discarded theories that once seemed to possess eternal life.

Arthur Koestler



The aim of science is not to open the door to infinite wisdom, but to set a limit to infinite error.

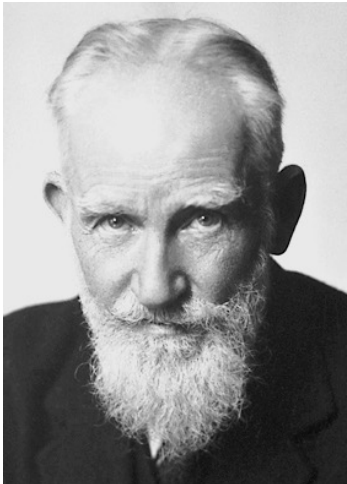
Bertholt Brecht

Public Goods?



Joe Stiglitz

A public good has two critical properties:
Non-rivalrous consumption, the consumption of one individual does not detract from that of another,
and
non-excludability, it is difficult if not impossible to exclude an individual from enjoying the good.

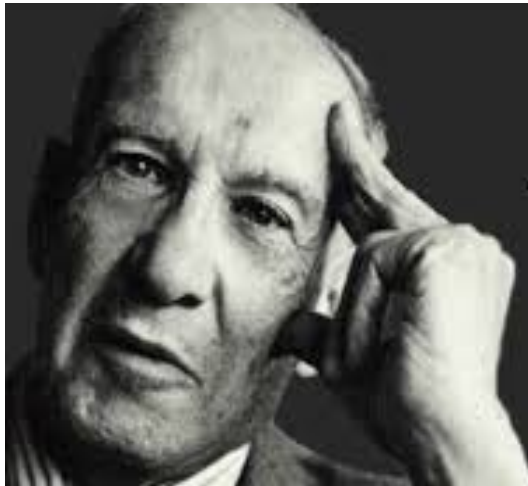
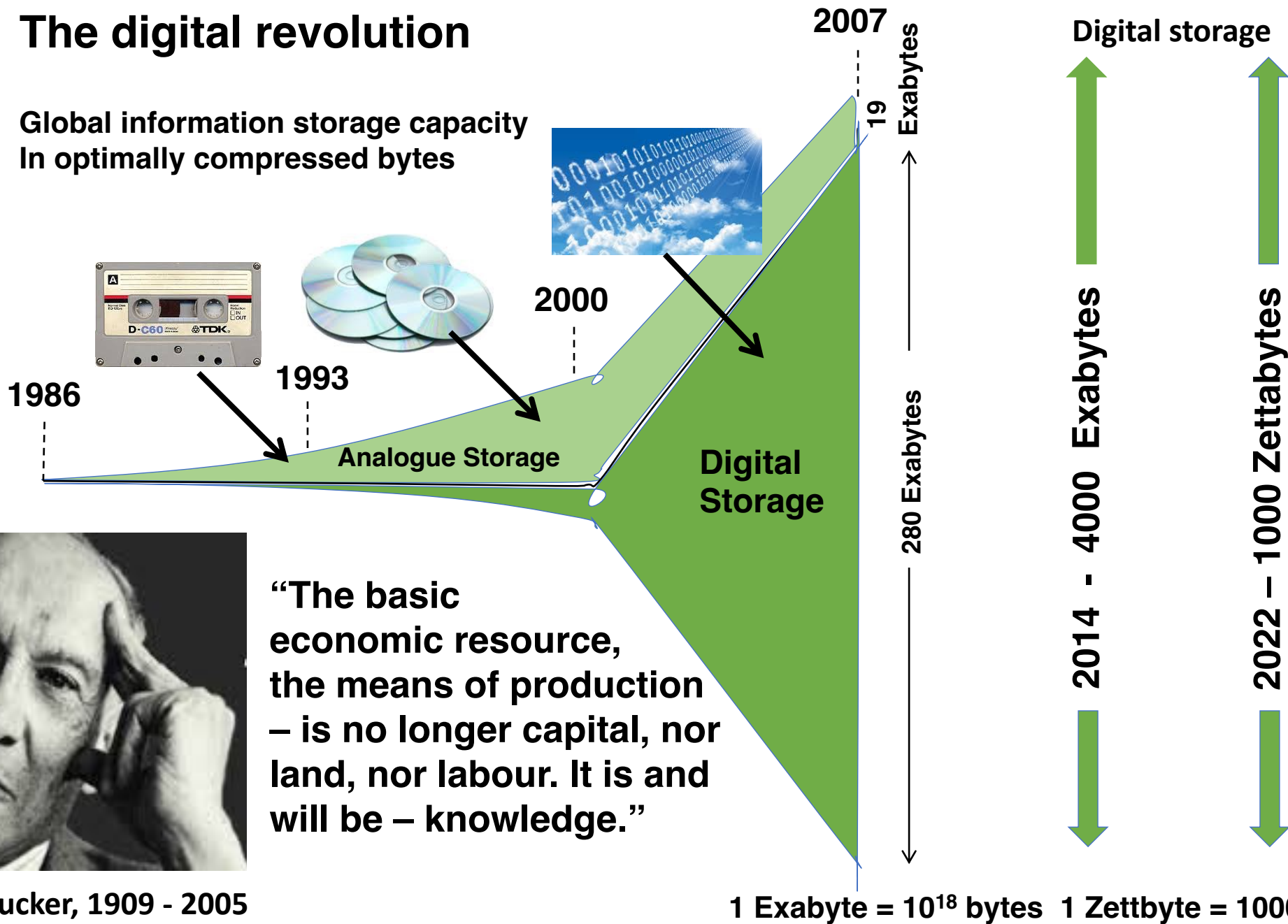


George Bernard Shaw

If you have an apple and I have an apple, then you and I will still each have one apple,
but
if you have an idea and I have an idea and we exchange these ideas, then each of us will have two ideas.

The digital revolution

Global information storage capacity
In optimally compressed bytes



Peter Drucker, 1909 - 2005

“The basic economic resource, the means of production – is no longer capital, nor land, nor labour. It is and will be – knowledge.”

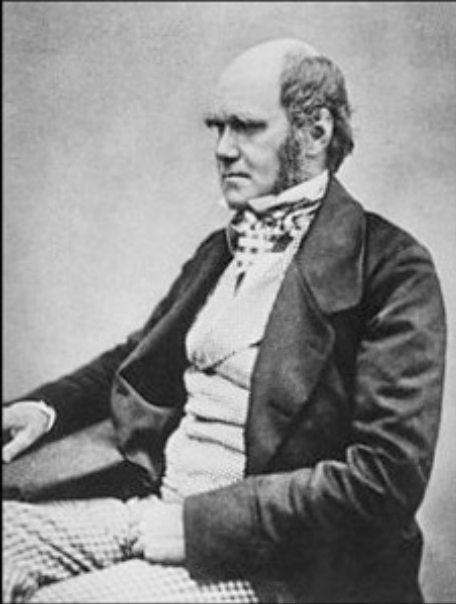
Responsibilities of scientists and their universities

- Expose the evidence for the truth claims that they make
- Disseminate their results in the public domain
- Act to mitigate significant potential for hazardous use



- Be responsive to the needs of their societies

The importance of open data



False facts are highly injurious to the progress of science, for they often long endure; but false views, if supported by some evidence, do little harm, as everyone takes a salutary pleasure in proving their falseness; and when this is done, one path towards error is closed and the road to truth is often at the same time opened.

Charles Darwin

Why Open Science?

- 1) Improving the rigour, integrity and efficiency of science**
- 2) Implementing globally affordable and accessible communication**
- 3) Exploiting cross-disciplinary data to explore complexity**
- 4) Engagement with society (in the transdisciplinary mode)**
- 5) Creating a global science commons**