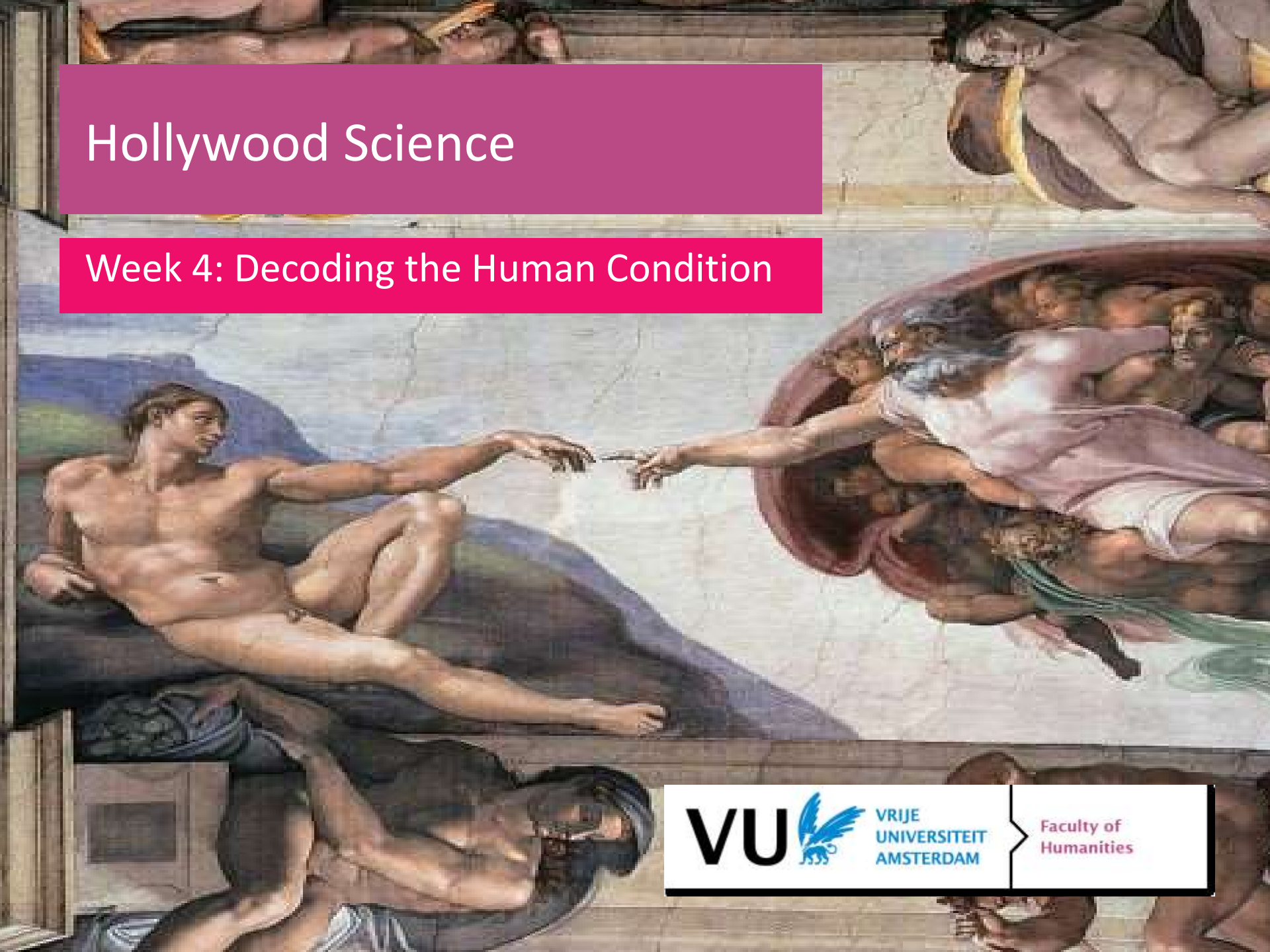


Hollywood Science

Week 4: Decoding the Human Condition



How Science Reflects and Directs Artistic Development

Today we will take a brief overview of ways in which ‘scientific discoveries’ about the **human condition** have been reflected in a variety of cultural/art fields and how these scientific advances have shaped the direction and development of culture in creative arts.

We will look at 4 specific areas in which this connection between art and science can be examined:

1. *Science, Classification and Fine Art*
2. *Darwin and Depicting Degeneration in Images*
3. *Eugenics and Culture*
4. *DNA & Genetic modification in film*

Science, Classification and Fine Art



Where do we come from?

- Explaining our origins
- Prior to the scientific explanations:
 - Religion, myth and legend
 - Arts and Culture always privileged for explaining vital questions

Who are we?

Where do we come from?

What separates the human from the animal?

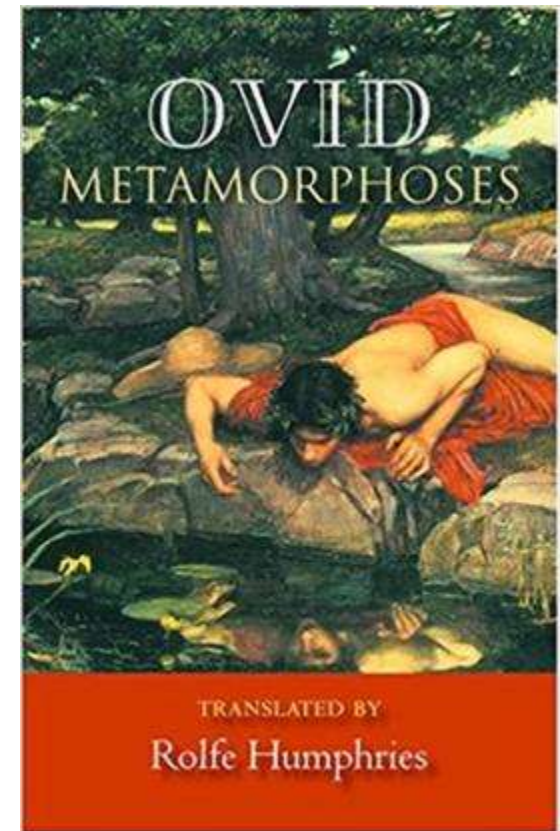
Every culture has a different way of representing this and some of the most beautiful art work has reflected the stories through which we debated these basic questions about our human existence...

Western culture & Myths of Creation

Cosmogonical / aetiological narratives

- Explaining the creation of the universe (cosmogony)
 - Greek mythology
- Explaining phenomena (aetiology)
 - Weather conditions (rainbow, lightning)
 - Geophysical events
 - Nature

Metamorphoses (8 AD), Ovid

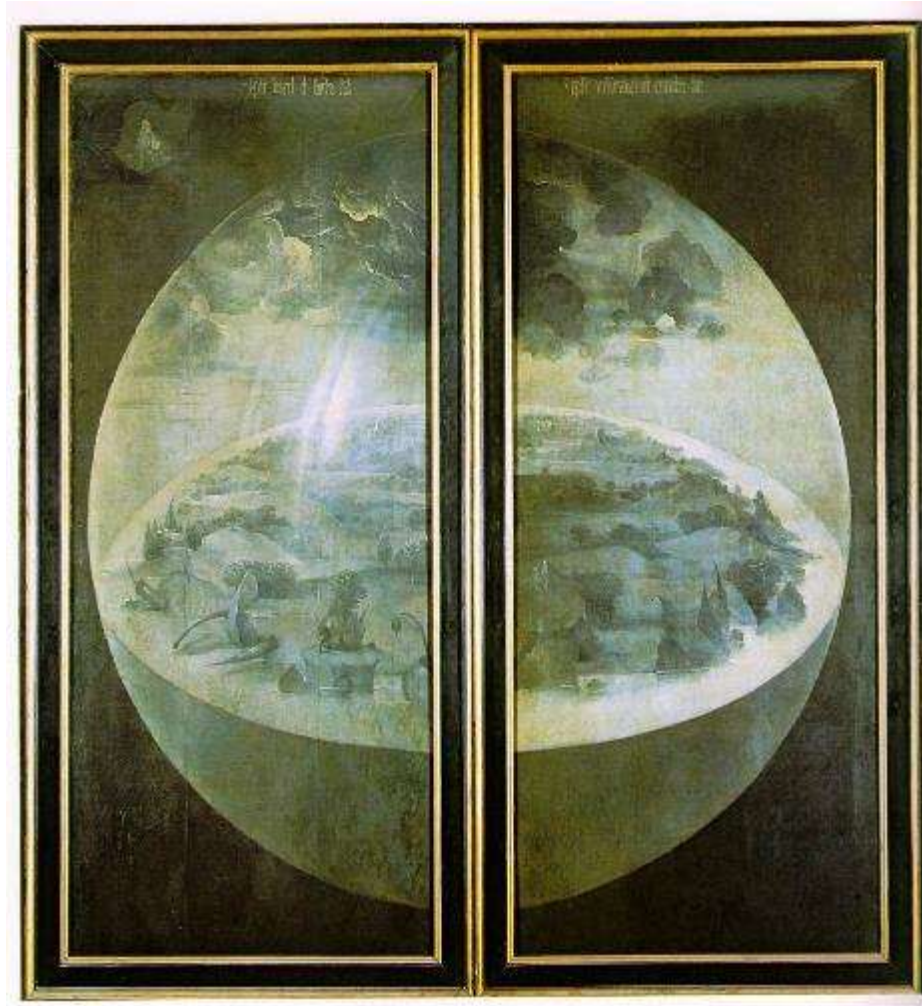


Western culture & Myths of Creation



The Garden of Earthly Delights (~1500) by Hieronymus Bosch

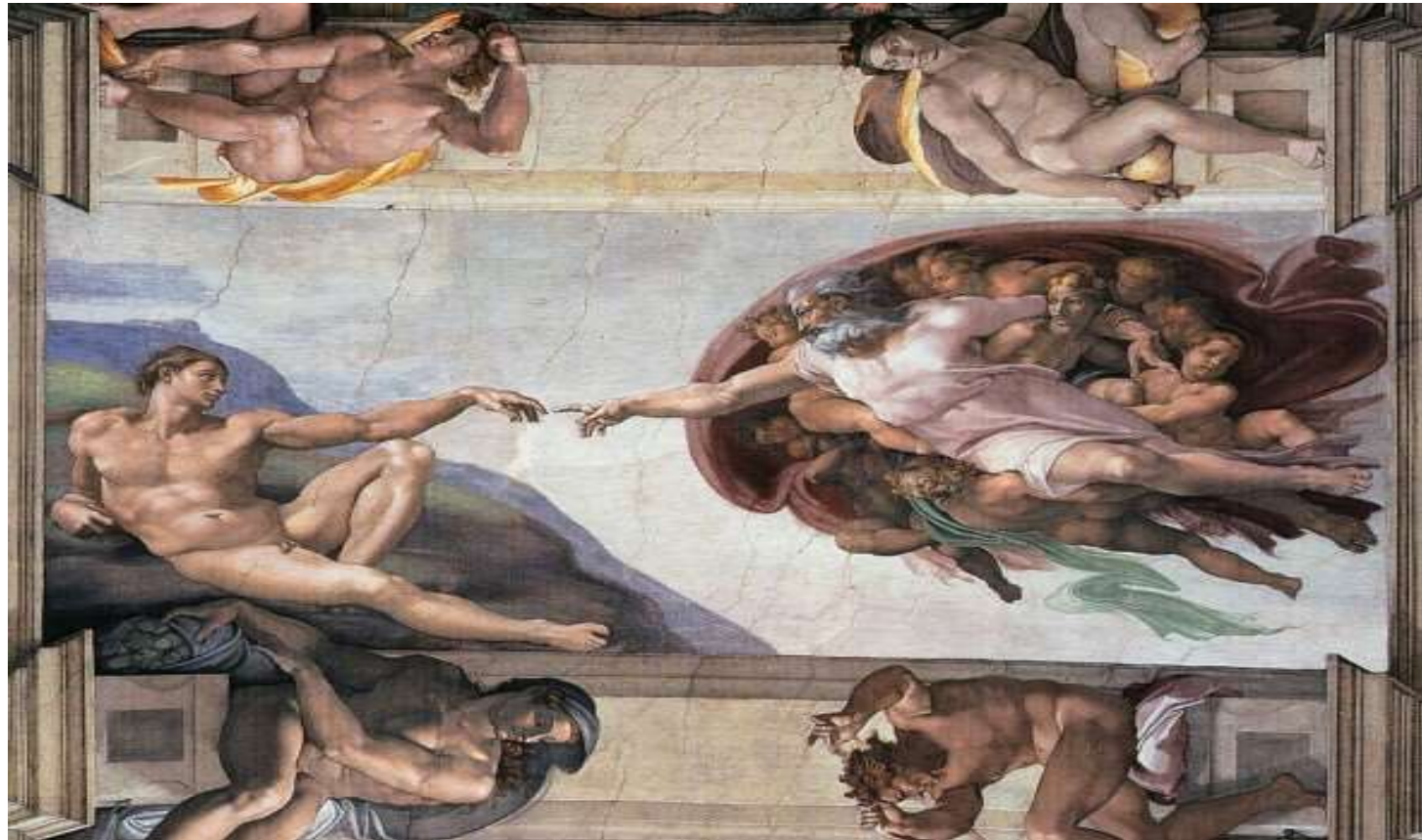
Western culture & Myths of Creation



The Garden of Earthly Delights (backside) by Hieronymus Bosch

Western culture & Myths of Creation

Representation of the 'origin of man' from Michaelangelo's Sistine Chapel fresco in the Vatican, Rome (1508/12, Renaissance)



Michelangelo's
Creation of Adam

Spark of Life

The detail where God touches the hand of Adam is referred to as 'The Spark of Life'



Taxonomy and Science

From 16th century onwards:

- Onset of scientific categorization / taxonomies
- Giving additional ways of understanding life on earth

Challenging the supremacy of cultural and religious explanations for human existence

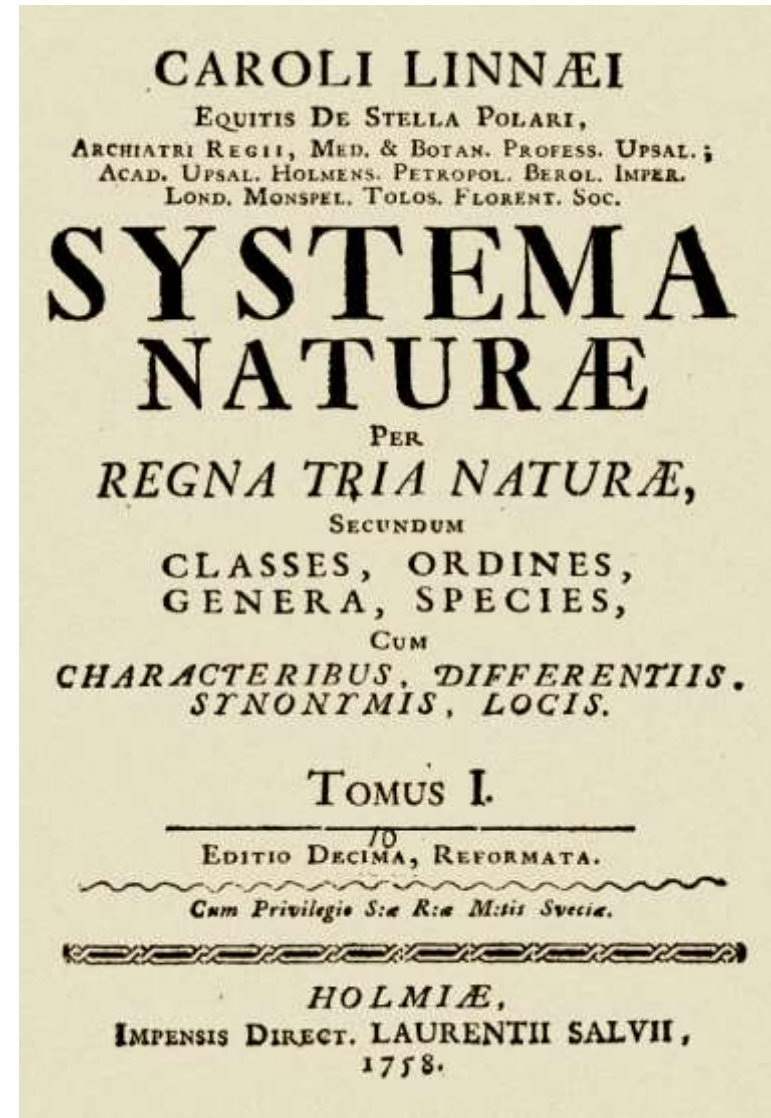
- Focus of science shifted towards the **complexity of the natural world:**
 - Systematic categorisation of life forms (Carolus Linnaeus)
 - Scientific instruments
 - New World discoveries
 - Land and species (plants/animals)
 - Cultural production

Classification of Species

Carolus Linnaeus (1707-1778)

Published in Latin in the Netherlands in 1758.

Groundbreaking in that it is the first text to adopt classifications based on **scientific observation** and was seen as a way of seeing and understanding 'God's design in Nature'.



Science Classification and Micro-life (Linneaus and Hooke)

The Natural Order

CAROLI LINNÆI															
I. QUADRUPEDIA.			II. AVES.			III. AMPHIBIA.			REGNUM ANIMALE.						
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Botanical Drawings

This new interest in detailed scientific observations also led to breakthroughs in artistic representations. **It became essential to record the differences between plants and animals in the most minute detail.**

Maria Sibylla Merian (1647 – 1717) was extremely important in developing this field of visual art.

Scientific observation and requirements changed the direction of fine art developments.



Maria Sibylla Merian

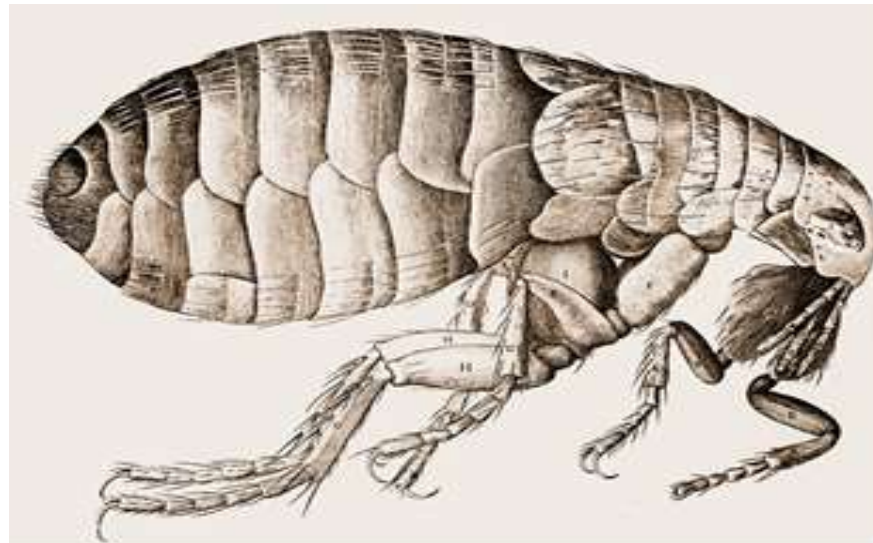
Metamorphosis insectorum Surinamensium [[online](#)]



Antonie van Leeuwenhoek (1632-1723) and the Microscope and Visual representation (Animacules)

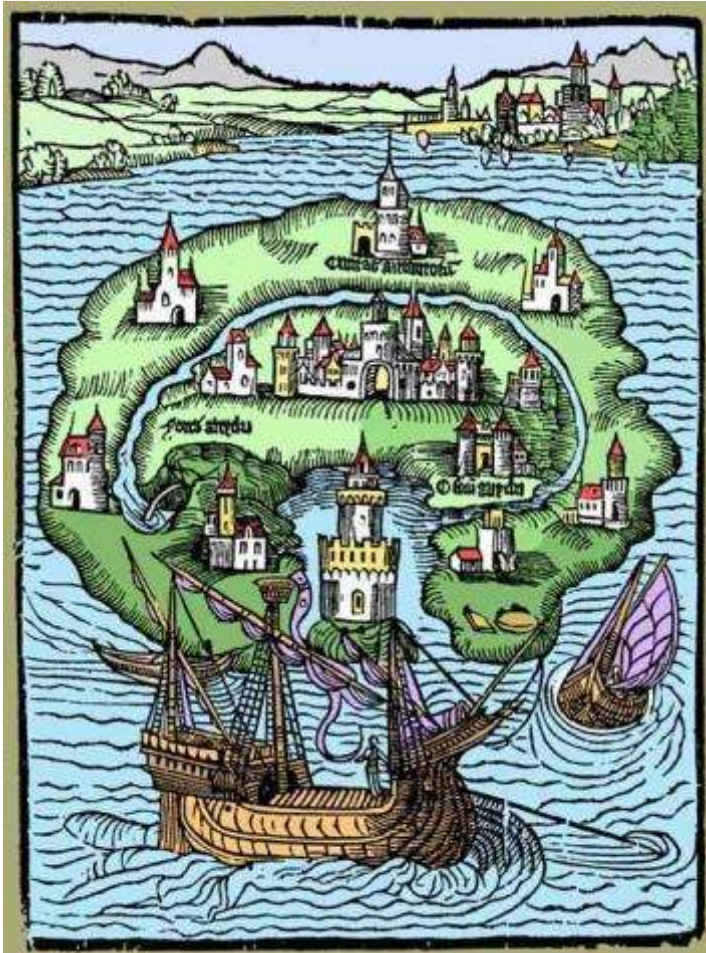
The development of technical scientific instruments such as the microscope also emphasized the necessity of recording minute details.

Reporting back to the Royal Society in London: Letter on the protozoa



The Flea

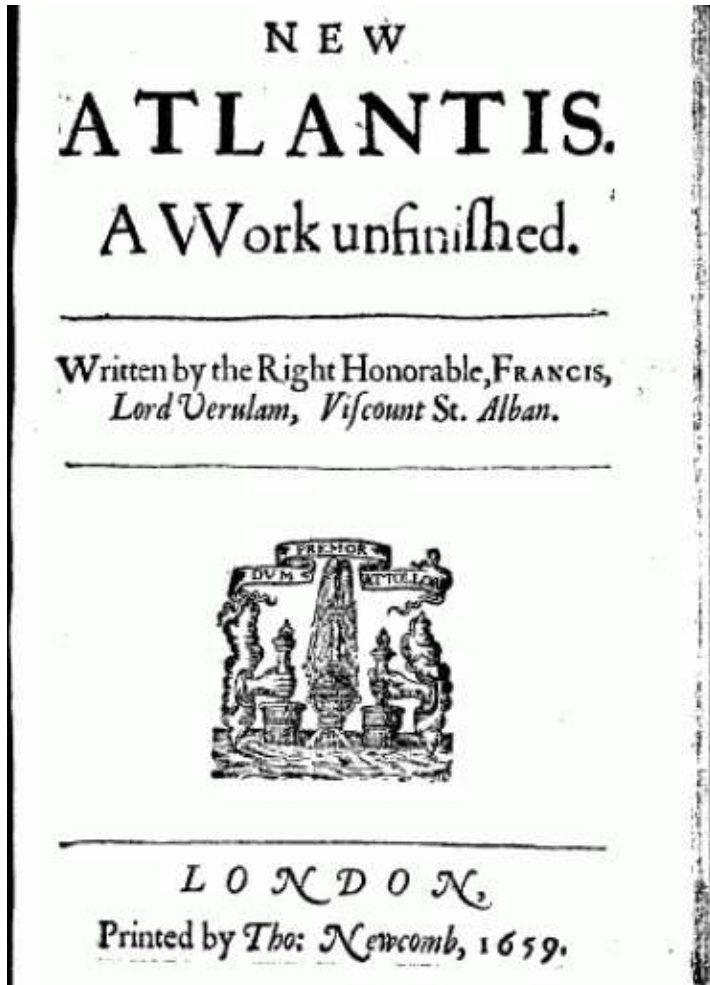
Literary versions of science: The imaginary voyage



Novels and fiction were also influenced by scientific discovery and interest in 'The new World'.

- *Utopia* (1514) by Thomas More
- Humanist utopia
- **More projects a commonwealth, in which men live and feel differently** (Williams)
- Politics, economics, society
- Interest for astronomy, climate, nature

Literary versions of science: The imaginary voyage



- *New Atlantis* (1627) by Francis Bacon
- Scientific Utopia
- **Bacon projects a highly specialised, unequal but affluent and efficient social order** (Williams)
- Future outline for society
- Prominent role for science in society
- Measurements and analyses (Baconian method)

Utopia: Definition

“The basic principle of a utopian narrative is to depict a place **that is better than the contemporary world** of the author and intended reader.

By displacing the action to far-off countries, places inside the Earth or somewhere in space, the author **creates an estrangement** that may be used **to discuss matters of current political interest in a manner that seems unthreatening**, or at least less threatening, to the authorities than if set in contemporary reality.”

(Dalgaard, p. 183)

Literary versions of science: The imaginary voyage



- *Gullivers Travels* (1726) by Jonathan Swift
- Descriptions of being 'tiny' in the Land of the Giants and 'giant' in the land of Lilliput.
- It plays with the new concepts and ideas of the microscope and visualising the miniscule scale.
- Satirical of new scientific methods
 - 'Extracting sunlight out of cucumbers'
 - Criticising Newton
 - [More examples](#)

Literary versions of science: The imaginary voyage



*“The reader may please to observe, that the following extract of many conversations I had with my master. [...] I laid before him, as well as I could, the whole state of Europe; I discoursed of trade and manufactures, of **arts and sciences.**”*

Darwin and Depicting Degeneration in Images

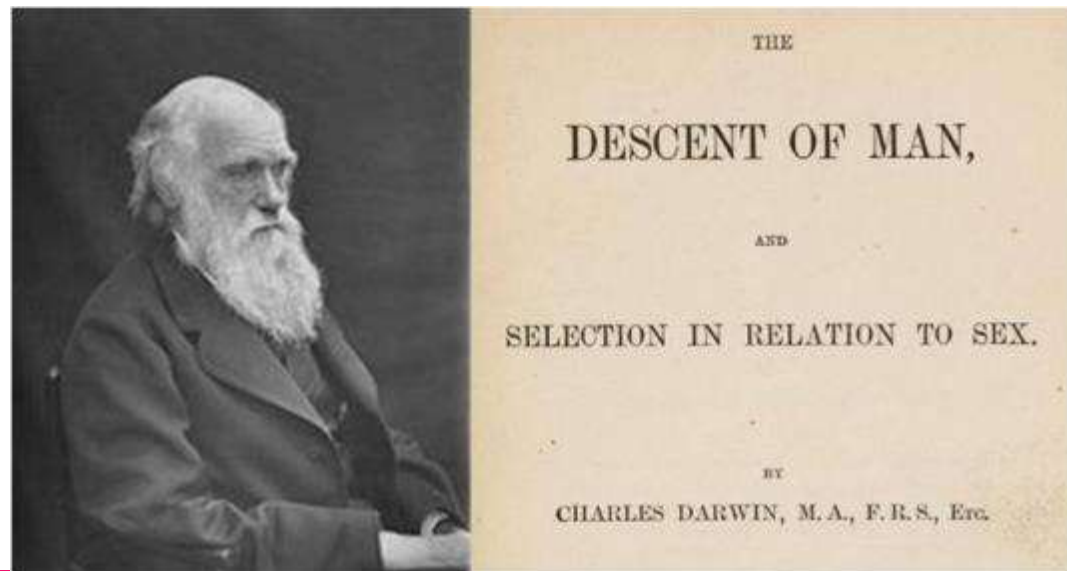


2. Darwin and Degeneration

Second example of the connection between science, culture and the representation of the human condition:

- Darwins publication of *The Descent of Man* in 1871.
 - This text introduced one of the most significant theories in the ‘narrative’ of human origins.

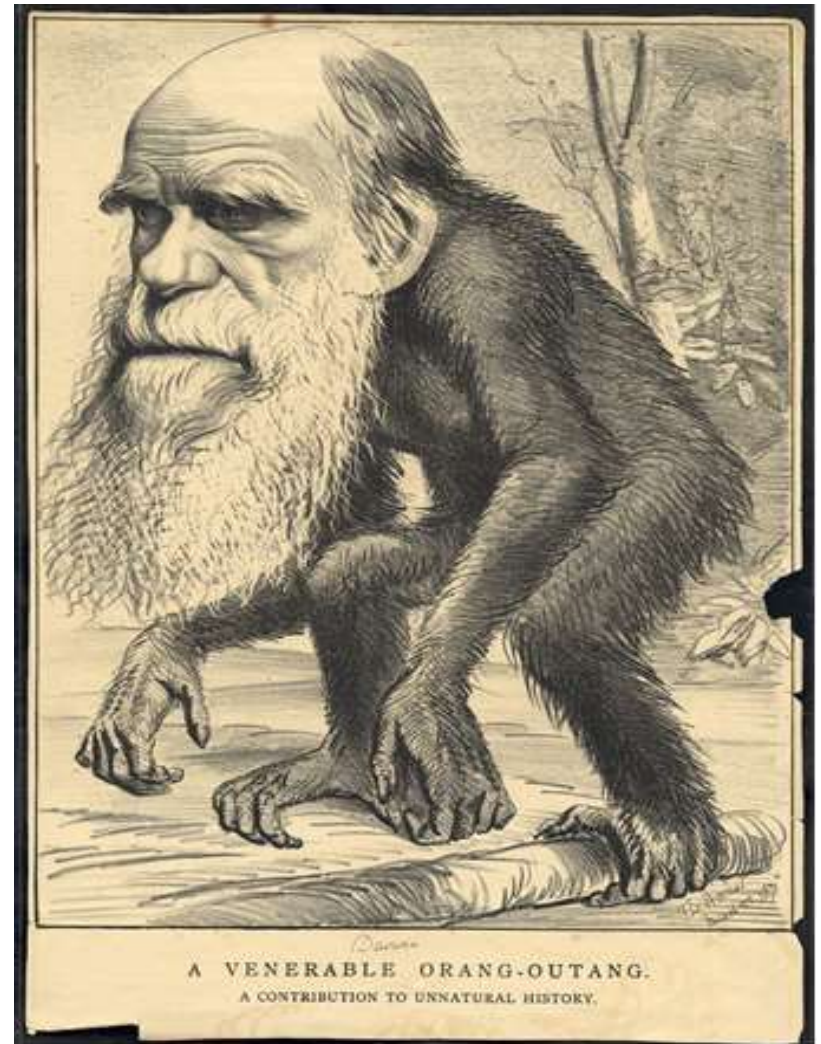
Its significance went **far beyond the world of ‘evolutionary science’** and in fact had a very deep impact on culture from the 19th Century onward.



Charles Darwin changes everything!

The text, '*The Descent of Man*' builds on Evolutionary Theory as applied to the human species and was met with a 'mixed, mostly negative, reception'.

On the Origin of Species (1859)



Darwin in Science Fiction

In post-Darwin's 19th Century, the theory of human evolution changed the way we see ourselves:

- We are not what we might seem
 - What lies within us?
 - Hidden residue of bestiality?
- For Darwin's critics: reducing humankind to a classification of 'apes'.

Darwin's theory was met with derision but also inspired a generation of early 'science fiction' writers.

Darwins Science in Culture

In fact Darwin's ideas inspires some of the most frightening and enduring ideas in literature about the 'hidden' nature of humanity and particularly cultural representation of 'degeneration' and regression.

Eugenics

- Term by Sir Francis Galton (1822-1911)
- Inspired by Darwin's publications
- He believed humankind 'could be improved through selective breeding'. (Gillham)
 - 'Positive eugenics'
- His lectures were the foundation for the practice of eugenics in early 20th century.

History of Eugenics

Eugenics is an set of beliefs that suggests it is possible to improve the overall genetic 'quality' of the human species through selective reproduction.

- Positive: encouraging the reproduction of those deemed 'fit' to reproduce
- Negative: prohibit of reproduction among those deemed 'unfit' to reproduce.

Art (books, movies, paintings etc.) can shape our thoughts about ethical issues such as these

Darwins Science in Culture

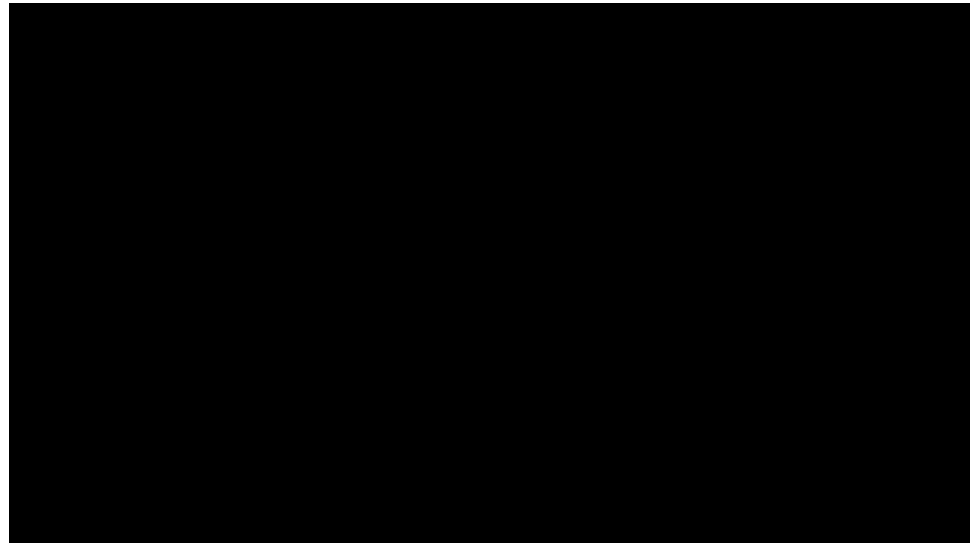
Cautionary tales on eugenics [[Eugenics in Popular Culture](#)]

Post-Darwinian British literature (1870-1900) has many examples of novels that depict the possibility of degeneration of 'man' and the dreadful consequences.

- H.G. Well's *Island of Dr. Moreau* (1896)
- R.L. Stevenson's *The Strange Case of Dr. Jekyll and Mr. Hyde* (1886)
 - Separating good and evil in men, experimenting

The Island of Dr Moreau (1977): Trailer

- Voyage, stranded on a deserted island
 - Cf. 'fantastic voyages'
- Experiments on animals
- (Natural) order?
- Beastly humankind



<https://youtu.be/HftWaY5qb1A>

The Strange Case of Dr. Jekyll and Mr. Hyde (1886)

- Degeneration
- Critiques of Victorian society and culture:
 - Humankind is not special

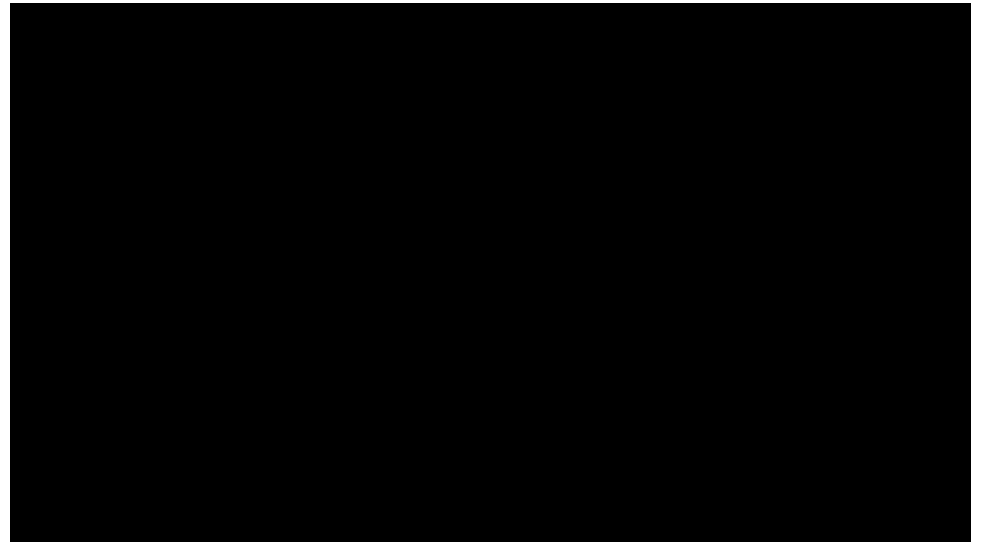
Through his scientific experiments, Dr. Henry Jekyll - gentleman and scientist - creates a chemical compound that, when drunk, releases the **‘inner self’**, getting rid of manners and civilisation and let **loose the ape-man that we evolved from**.

In the tale, the compound causes Dr Jekyll to become Mr. Hyde and in the latter form he is able to indulge in all sorts of basic behaviours that Henry Jekyll desires but represses in himself in his social **‘performance’** as a civilised gentleman.

Hollywood Evolution

It is in cinema that a 'fixed' image of man as 'ape' becomes established.

Transformation scene from
*The Strange Case of Dr.
Jekyll and Mr. Hyde* (1941)



<https://youtu.be/zqqZ0yFqY04?t=21s>

<https://youtu.be/uN4Di8DEPf8>

Ape 'mirrors' Man

Pierre Boule's

Planet of the Apes (1966)

(alternative evolution trajectory → what if?)

Inspired by Darwinian ideas,
the author create a tale which
explores what **might have
happened** if another kind of ape
superseded 'homo sapiens'
in a **dystopian**/nightmare world.



Ape 'mirrors' Man



<https://arstechnica.com/tech-policy/2017/08/monkey-selfie-animal-rights-brouhaha-devolves-into-a-settlement/>

Tarzan: Man 'mirrors' Ape

21st Century
'nostalgia' for
Nature?

Perhaps a reference to
our lost connection
with nature and desire
to recognise our
Place as part of
the natural world?



Eugenics and Culture



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Dystopia

Genre of the **Dystopia**:

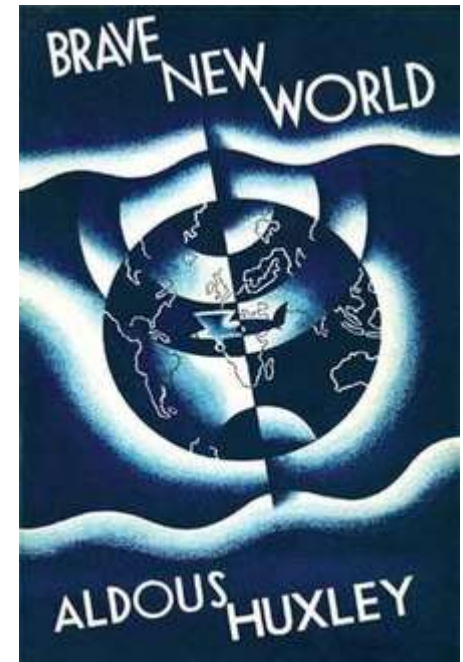
- **Projecting a world that is worse than our own**

Aldous Huxley's *Brave New World* (1931)

- Critique to technological development
- Genetic engineering

George Orwell's *1984* (1948)

- Marginalising a social group



Dystopia



<https://www.theguardian.com/books/2017/mar/25/dystopian-dreams-how-feminist-science-fiction-predicted-the-future>



Dystopian dreams: how feminist science fiction predicted the future

From Mary Shelley to Margaret Atwood, feminist science fiction writers have imagined other ways of living that prompt us to ask, could we do things differently?

Naomi Alderman

Sat 25 Mar 2017 08.00 GMT



34,466 845

Margaret Atwood's evergreen dystopian novel *The Handmaid's Tale* is about to become a television drama. Published in 1985, it couldn't feel more fresh or more timely, dealing as it does with reproductive rights, with the sudden accession to power of a theocracy in the United States, with the demonisation of imagined, pantomime villain "Islamic fanatics". But then, feminist science fiction does tend to feel fresh - its authors have a habit of looking beyond their particular historical moment, analysing the root causes, suggesting how they might be, if not solved, then at least changed.

Posthumanism


posthumanism, *n.*²

Text size:  A

View as: [Outline](#) | [Full entry](#)

Quotations: [Show all](#) | [Hide all](#) Keywords: [On](#) | [Off](#)

Pronunciation: Brit.  /ˌpəʊstˈhjuːmənɪz(ə)m/,

U.S.  /ˌpoʊstˈhjuːməˌnɪz(ə)m/

Frequency (in current use): ●●●●●●●●

Origin: Formed within English, by derivation. **Etymons:** [POST-HUMAN](#) *adj.*, *-ISM* *suffix*.

Etymology: < [POST-HUMAN](#) *adj.* + *-ISM* *suffix*. Compare earlier [POST-HUMANISM](#) *n.*¹

orig. *Science Fiction*.

The idea that humanity can be transformed, transcended, or eliminated either by technological advances or the evolutionary process; artistic, scientific, or philosophical practice which reflects this belief.

[Categories »](#)

- 1971 I. HASSAN in *New Literary Hist.* 3 25 From infrahumanism to posthumanism, beyond man and into the cosmos. Sci-fi. To love life and to love man are no longer the same.
- 1996 T. TERRANOVA in G. Robertson et al. *FutureNatural* xi. 174 Believers in posthumanism are not so much saying, 'we are what our genes say we are' but.. 'thanks to technology, there are no limits to what we can be'.
- 2003 B. MCKIBBEN *Enough* (U.K. ed.) iii. 116 That mood leaves one vulnerable to the siren song of posthumanism—to the idea that we should be radically reconfigured, or better yet surpassed by some wiser race.

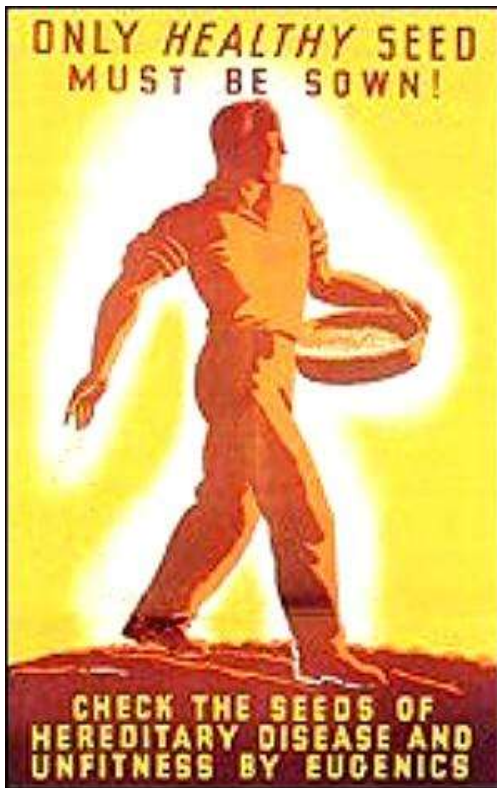
[\(Hide quotations\)](#)

OED, 3rd
edition
(December
2006)

Eugenics, Genetics and human Perfection

American Eugenics Society (1920s)

Promotion posters



Evolution still happening?

- DNA mutation
 - Larger spleens

<https://news.nationalgeographic.com/2018/04/bajau-sea-nomads-free-diving-spleen-science>



PHOTOGRAPH BY MATTHIEU PALEY, NATIONAL GEOGRAPHIC

[+ READ CAPTION](#)

'Sea Nomads' Are First Known Humans Genetically Adapted to Diving

For hundreds of years, the Bajau have lived at sea, and natural selection may have made them genetically stronger divers.



Eugenics, Genetics and human Perfection



Hollywood version

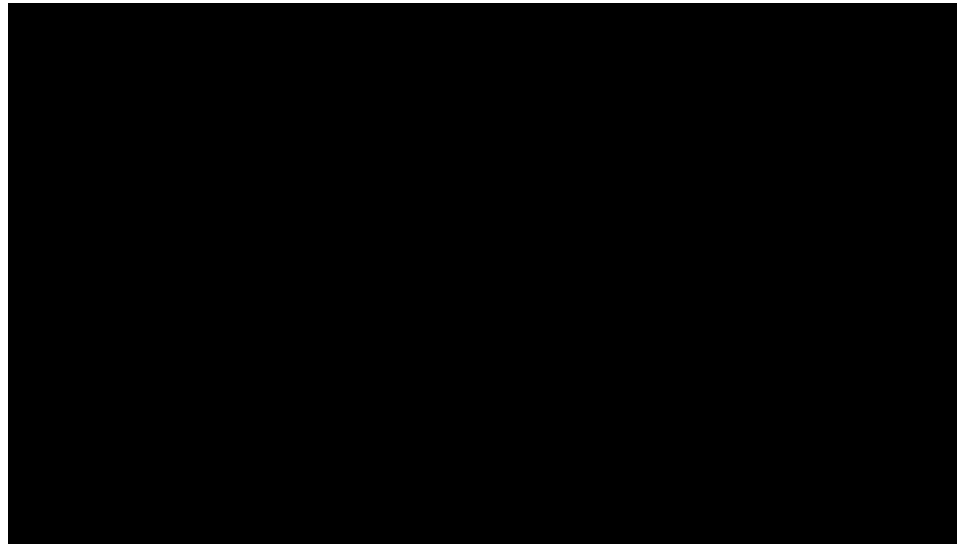
Freaks (1932), dir. Tod Browning

The idea of examining the lives of the 'disabled' was even the subject of a Hollywood film.

Based on a real carnival sideshow, this controversial film had direct references to the topic of eugenics and genetic hygiene.



Hollywood's Freaks (1932): Trailer



<https://youtu.be/vJVXTKkjsxA>

Nazi Propaganda Poster 1932

However the use of eugenics to justify the disturbing racial policies in Nazi Germany led to overall condemnation of the practice.

The text reads:
60 000 Reichsmarks
is what this person suffering from a
hereditary defect costs the People's
community during his lifetime.
Fellow citizen,
that is your money too.
Read *New People*,
the monthly magazine of the Bureau
for Race Politics of the NSDAP



FIG 2 Nazi propaganda poster supporting the sterilisation or euthanasia of people with mental disabilities.

Condemnation of the practice of eugenics

- Complete decline after WWII

The crime of genocide is defined in international law in the *Convention on the Prevention and Punishment of Genocide* [1948].

"Article II: In the present Convention, genocide means any of the following acts committed with intent to destroy, in whole or in part, a national, ethnical, racial or religious group, as such:

- (a) Killing members of the group;
- (b) Causing serious bodily or mental harm to members of the group;
- (c) Deliberately inflicting on the group conditions of life calculated to bring about its physical destruction in whole or in part;
- (d) Imposing measures intended to prevent births within the group;
- (e) Forcibly transferring children of the group to another group.

From:

<http://www.genocidewatch.org/genocide/whatisit.html>

AUDIO HUB  SUBSCRIBE 

UN panel warns against 'designer babies' and eugenics in 'editing' of human DNA



Creative Commons CC0



5 October 2015

Warning that rapid advances in genetics make "designer babies" an increasing possibility, a United Nations panel today called for a moratorium on "editing" the human genome, pending wider public debate lest changes in DNA be transmitted to future generations or foster eugenics.

Frankenstein (1931)

Does the eugenics discussion add to our understanding of Whale's 1931 portrayal of Frankenstein as 'victim'?



DNA & Genetic modification in film

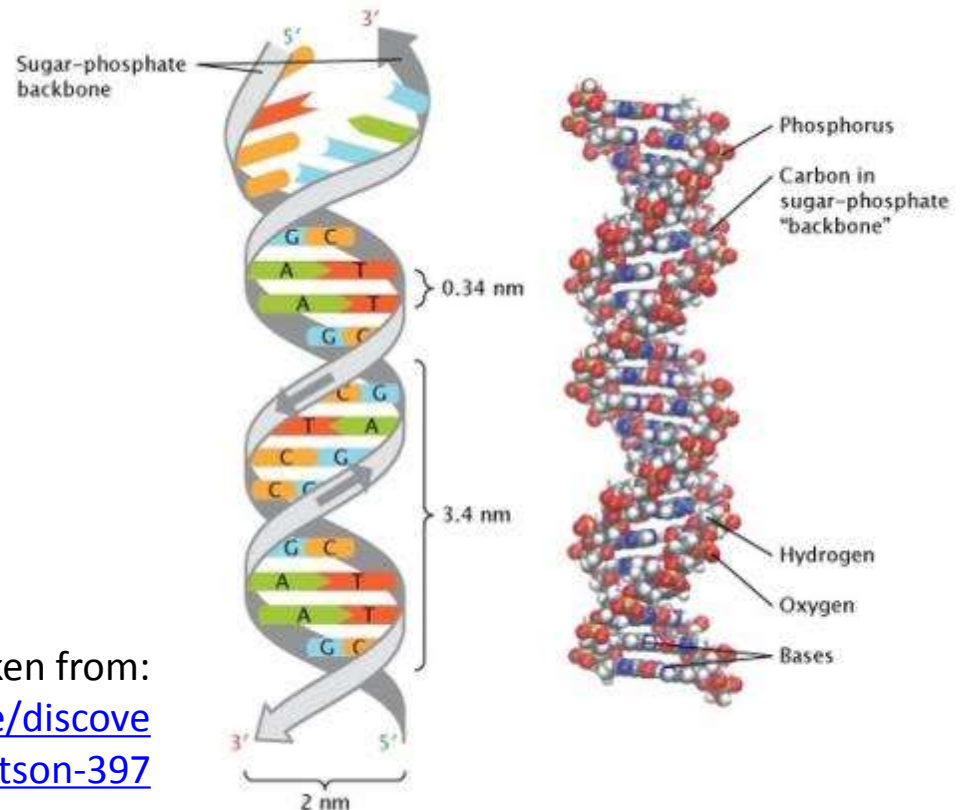


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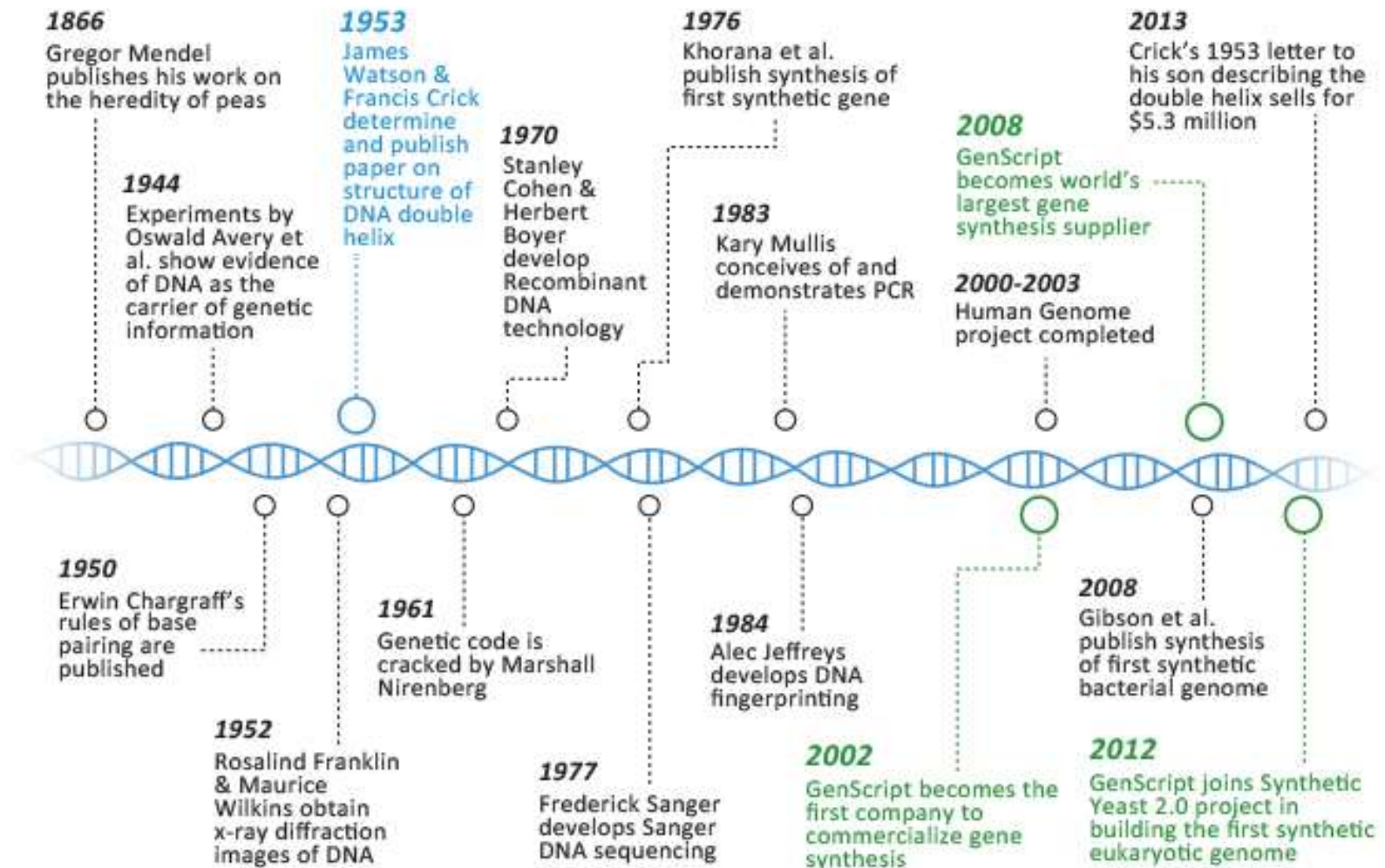
The Watson and Crick model in 1953

- One of the most significant discoveries of the 20th century
 - Revolutionarise study of medicine and biology (genetics)
- 'Rivalry' with Maurice Wilkins and Rosalind Franklin
 - Experiments with X-rays
- Cardboard cut-out



The double-helical structure of DNA. Taken from:
<https://www.nature.com/scitable/topicpage/discovery-of-dna-structure-and-function-watson-397>

DNA: A scientific journey



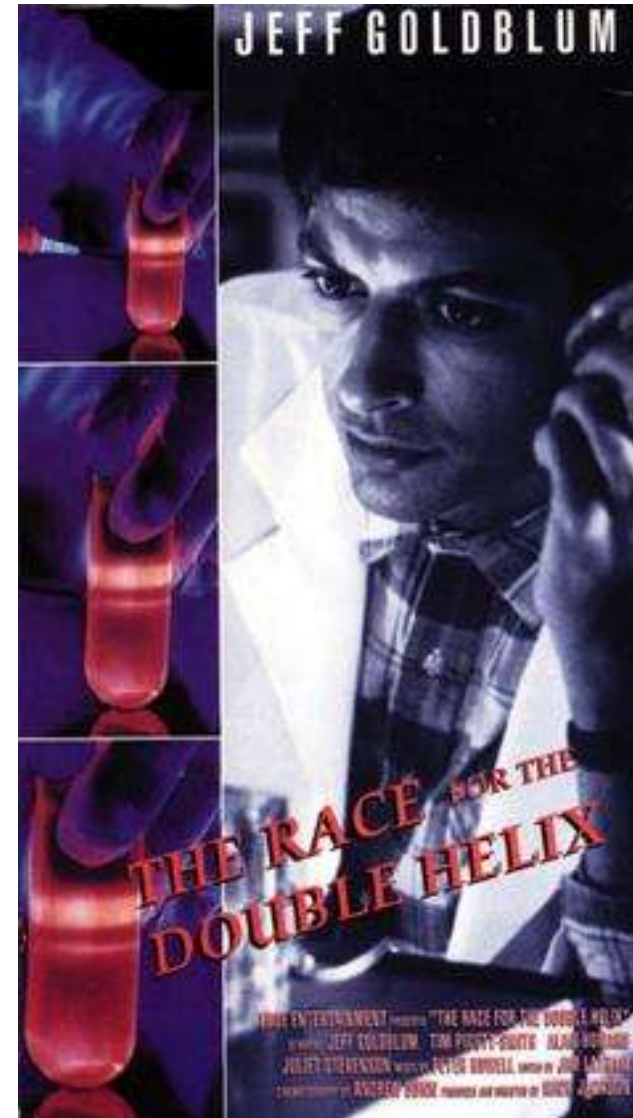
DNA: The Hollywood explanation

Dramatised

- *Life Story* (1987)

“Watson and Crick race to find the structure of DNA before Linus Pauling, Maurice Wilkins, or Rosalind Franklin can find the key to unlocking the secret.”

Taken from: <http://www.imdb.com/title/tt0093815/>

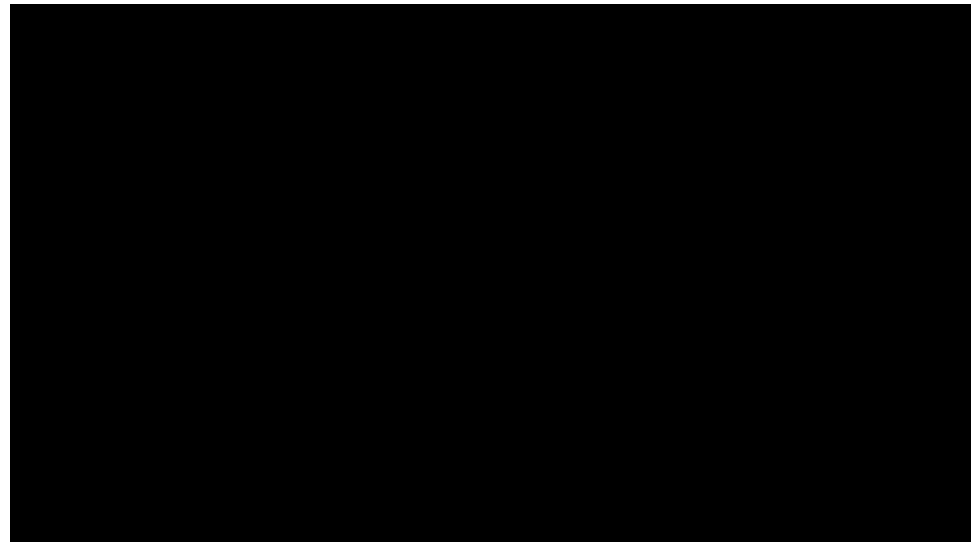


DNA: The Hollywood explanation

Cartoonesque

- Most famously ‘explained’ in Jurassic Park.
 - What is perhaps most interesting here is the ‘factual accuracy’ of the Mr. DNA film that clearly explains what DNA is.
 - Different perspective: This clip shows the ‘real’ scientists watching the ‘simple’ cartoon.

Mr. DNA from *Jurassic Park*
<https://youtu.be/qUaFYzFFbBU>



Cloning

Cloning is another perennial theme in popular culture that has gone from being a science fiction nightmare to part of our real scientific world.

As Perkowitz points out:

“Genetic engineering and human cloning may never come to pass, for reasons scientific, ethical, or both...” (p. 137)

According to National Human Genome Research Institute

<https://www.genome.gov/25020028/cloning-fact-sheet/>

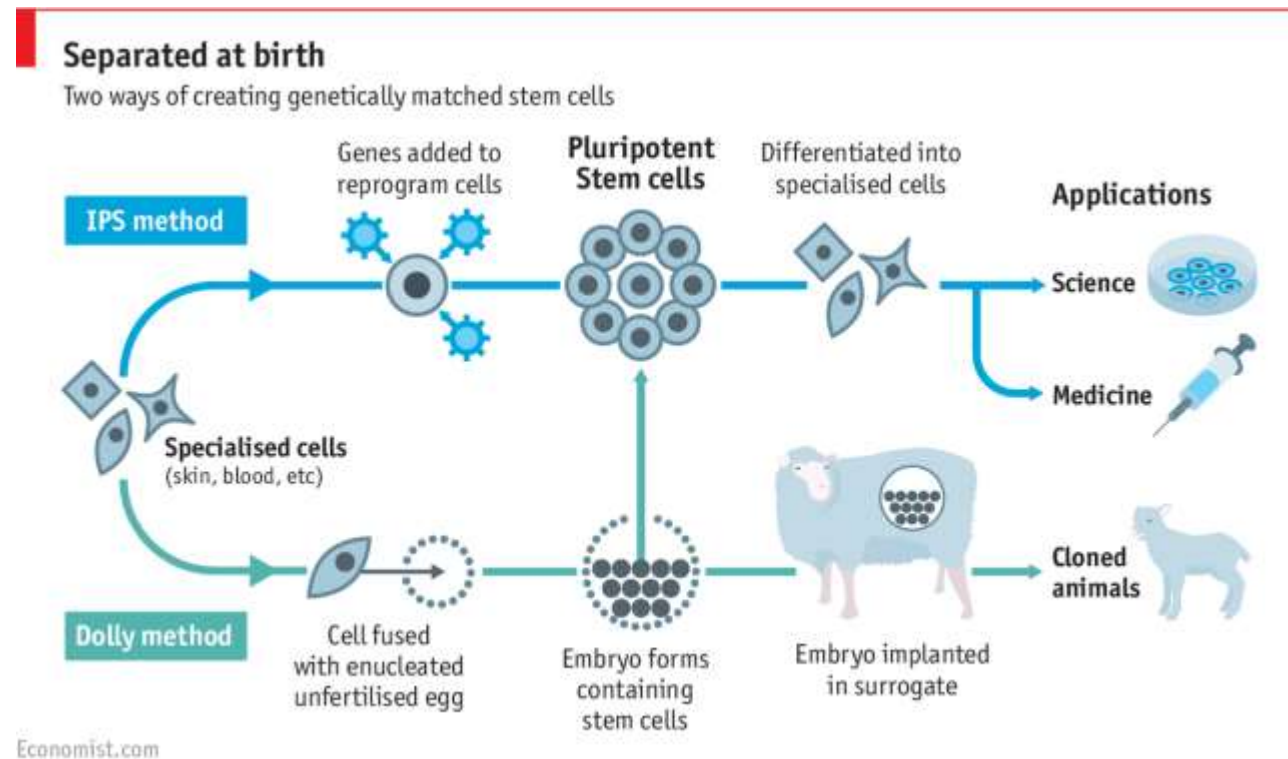
“Despite several highly publicized claims, human cloning still appears to be fiction. There currently is no solid scientific evidence that anyone has cloned human embryos.”

New Scientist: 20 years of Cloning

In February 1997 Ms Karen Mycock who worked at the Roslin Institute, an animal research centre near Edinburgh had passed ‘**a tiny jolt of electricity**’ through two sheep cells in a dish.

The **electric jolt** had caused the two cells to fuse, forming an embryo!

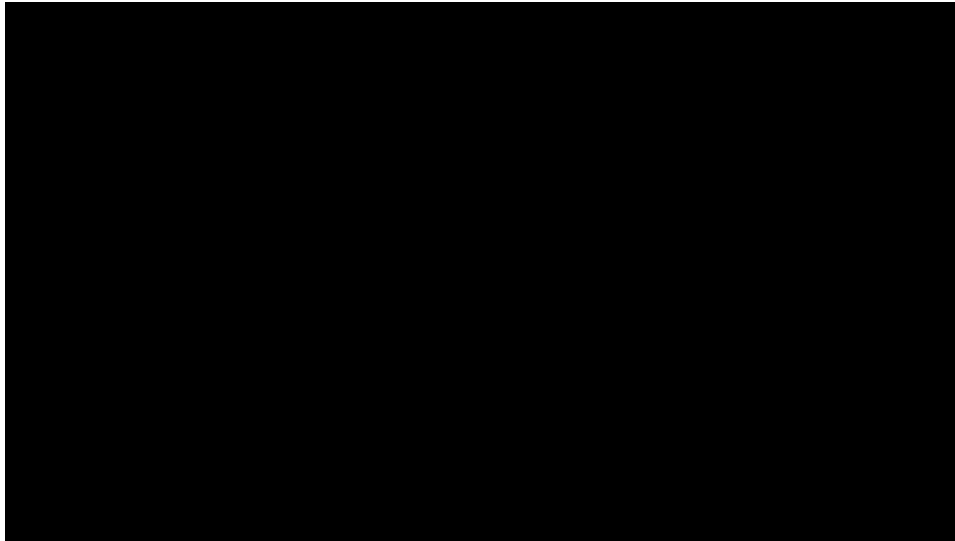
<http://www.economist.com/news/briefing/21717028-twenty-years-ago-world-met-first-adult-clone-sheep-called-dolly-her-legacy-lives>



Intertextuality?



Dolly



<https://youtu.be/qfNUGNsuw7o>

Dolly

The birth of Dolly was met with very strong media reactions (Darwin?)

Gear of the possibility of human cloning, of science gone mad, questions of ethics. The real science seemed to have **gone beyond 'fiction'...**



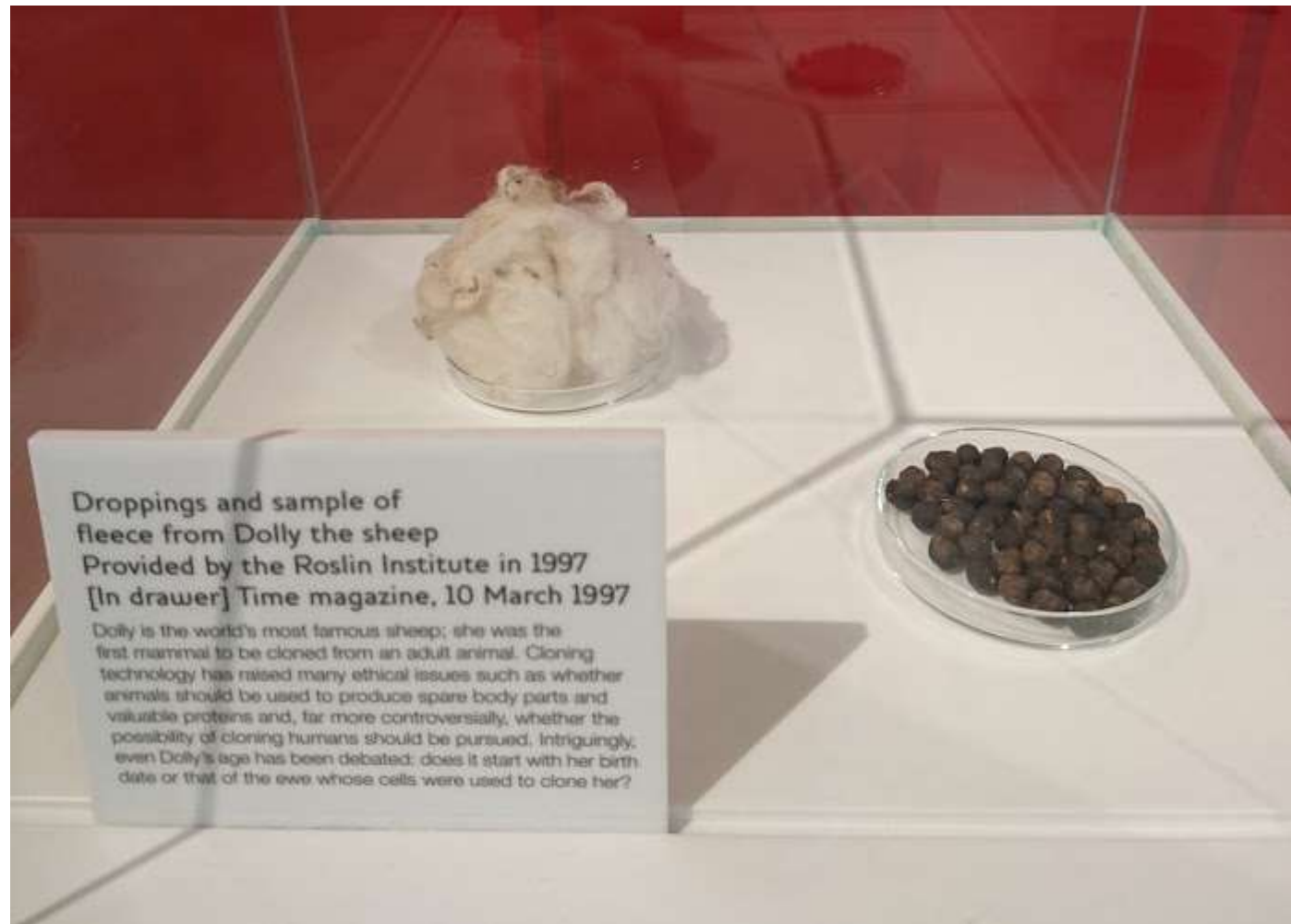
Genetics, DNA and Cloning

- Therapeutic potential?

“[Cloning Dolly] was supposed to be a biological impossibility because before her birth it was assumed that all cells ‘commit’ as they develop, becoming particular kinds of cells. The assumption was that as cells differentiate and develop to become specialised celltypes, they lose the capacity to become other kinds of tissue”

(Franklin, p.38)

Genetics, DNA and Cloning

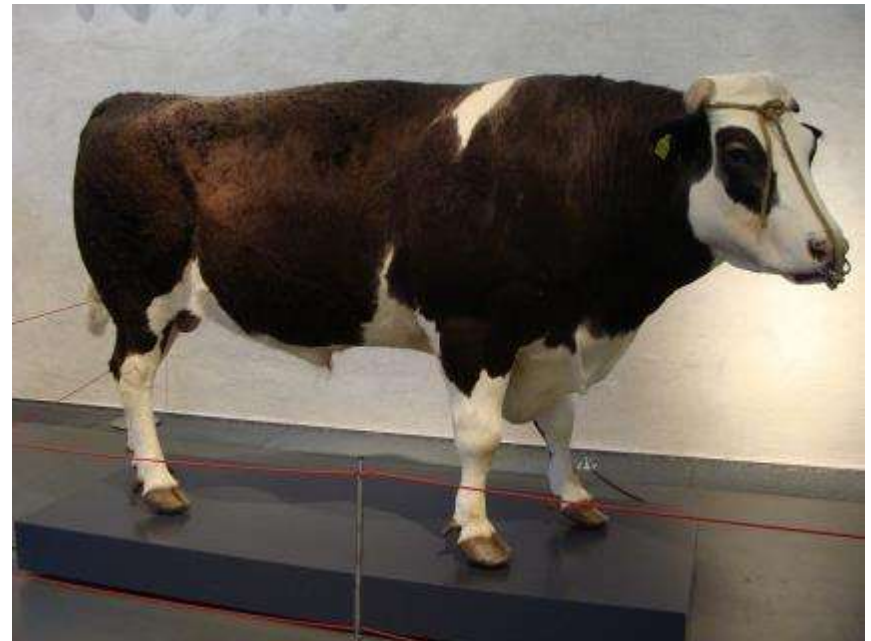


Own work,
Wellcome
Collection London
2017

Genetics, DNA and Cloning

Herman (1990-2004), the world's first transgenetic bull

- He got human genes inserted in his DNA to produce Lactoferrin
- Dutch law was changed to allow Herman to reproduce



Taken from:

[https://nl.wikipedia.org/wiki/Herman_\(stier\)](https://nl.wikipedia.org/wiki/Herman_(stier))



Could CRISPR Make X-Men a Realistic Possibility?

Posted on May 26, 2016 at 9:00 am

The first X-Men movie hit our screens back in 2000 and we've been treated to multiple sequels and spinoffs over the last 16 years, the latest of which, 'X-Men: Apocalypse', will be released across cinemas globally this month. X-Men: Apocalypse focuses on 'Apocalypse', the first and most powerful mutant who awakens after thousands of years to be greeted by a world he's disillusioned with. We follow Apocalypse and his team of mutants on their quest to cleanse mankind and create a new world order. Obviously things don't go entirely to plan for Apocalypse as Raven (also known as Mystique) and Professor X work to lead the X-Men to stop their nemesis and save mankind – sounds like a pretty busy weekend for the mutants.

It seems like each time a new X-Men movie is released the world turns to science to ask if it will be possible to create a generation of X-Men in the future, and when. On the blog this week we've decided to answer those questions for

<http://www.synthego.com/blog/could-crispr-make-x-men-a-realistic-possibility/>

Genetics, DNA and Cloning

- Biomedicine?

Biomedicine is rewriting the map of the normal, no longer striving “only to heal people, but to go further - to transcend nature and improve on bodies, minds, and even society, in a way that the early 20th-century eugenicists could never have dreamed of” [...], **redefining health as “improving on nature”**

(Vint, p.105)

X-Men



Going further: from modification to manipulation

It is clear that the cinematic representation of Genetics and genetic modification are nearly always critical of both the known and unknown potential of genetic engineering that is part of our contemporary scientific landscape.

For the public/ non-specialist, Hollywood cinema presents this ‘tinkering’ with nature as something that nearly always unleashes frightening results. (Remember the ‘What if?’)

Genetics (like electricity in the 18th Century, cf. Frankenstein) is seen as a potential hazard to human existence. What is interesting for us is to examine how complex scientific discoveries such as DNA are **‘translated’** by Hollywood for a general public.

But Hollywood projects a different idea...

It is hard to imagine that we could not clone a human being. So Hollywood 'dares' to represent what is possible...



<http://www.nature.com/news/should-you-edit-your-children-s-genes-1.19432>

Would you edit the genome of your future to child?

For many people, the initial impulse might lead you to say no, based on the idea that any benefits could be outweighed by the risks. But considering certain classes of genetic conditions, it's possible that one's perspective might change.

Media discussions of the prospect of utilizing these tools to edit the genomes of human embryos have been influenced heavily by the idea that we should hold off on Designer babies. Critics suggest that it's too dangerous; the human genome and gene expression is extremely complex such that meddling could lead to unpredictable consequences.

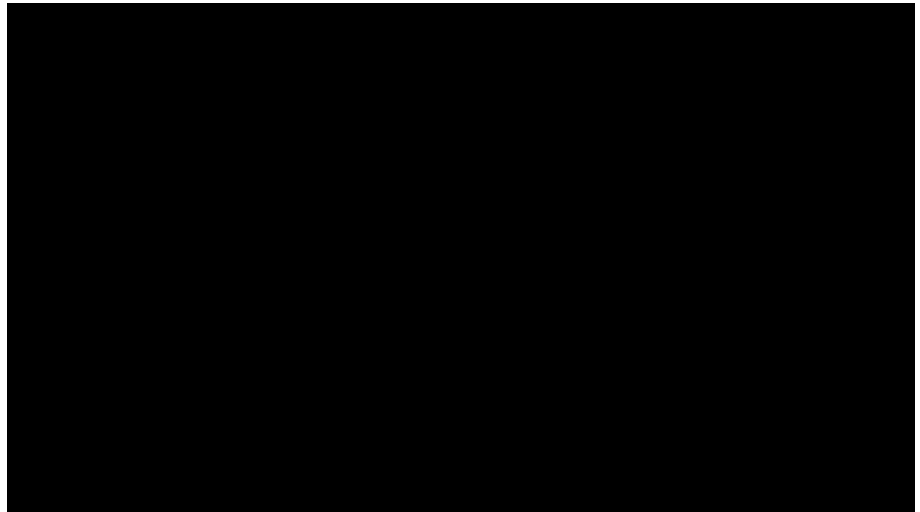
Gattaca: The Dystopian potential of DNA



Hollywood and DNA

Gattaca

- Routine genetic manipulation
- Valids and Invalids
- Social order based on quality of genes
- Possibility to predict one's death prior to birth
- The end? Meaning? Fate?



<https://youtu.be/3peP1npjPNM>



Cyberpunk

cyberpunk, n.

Text size: **A** **A**

View as: Outline | [Full entry](#)

Quotations: Show all | [Hide all](#) Keywords: On | [Off](#)

Pronunciation: Brit.  /ˈsaɪbərˌpʌŋk/, U.S.  /ˈsaɪbərˌpʌŋk/

Forms: also with capital initial.

Frequency (in current use): ●●●●●●●●

Origin: Formed within English, by compounding. **Etymons:** CYBER- *comb. form*, PUNK *n.*¹

Etymology: < CYBER- *comb. form* + PUNK *n.*²... (Show More)

1.

a. A subgenre of science fiction typified by a bleak, high-tech setting in which a lawless subculture exists within an oppressive society dominated by computer technology.

[Thesaurus »](#)
[Categories »](#)

In quot. 1983 as the title of a story of this type.

1983 B. BETHKE in *Amazing Stories* Nov. 94 (title) Cyberpunk.

1984 *Washington Post* 30 Dec. (Bk. World section) 9/3 Surely the wild and woolly 'outlaw fantasy' Waldrop began producing in the '70s played some part in shaping the esthetics and literary style of the 'cyberpunk' movement.

1988 *Times Lit. Suppl.* 21 Oct. 1180/3 The subgenre of science fiction now widely known as Cyberpunk, in which life in the computerized jungle of the near future can only be survived by young street-wise masters of software interfaces and the arts of combat.

2001 *Dreamwatch* Oct. 80/2 Adroitly mixing grandiose space opera with the darkness and occasional cynicism of Cyberpunk, Banks' Culture books are unsettling, fiendishly clever and frequently hilarious.

(Hide quotations)

Cyberpunk

- Dystopian setting
- Information Technology
- Futuristic?
- Focus on human condition, genetic manipulation
 - **Focus on the human identity. What does it mean to be human?**
- New world order, new social order

Questioning the technological developments for humanity

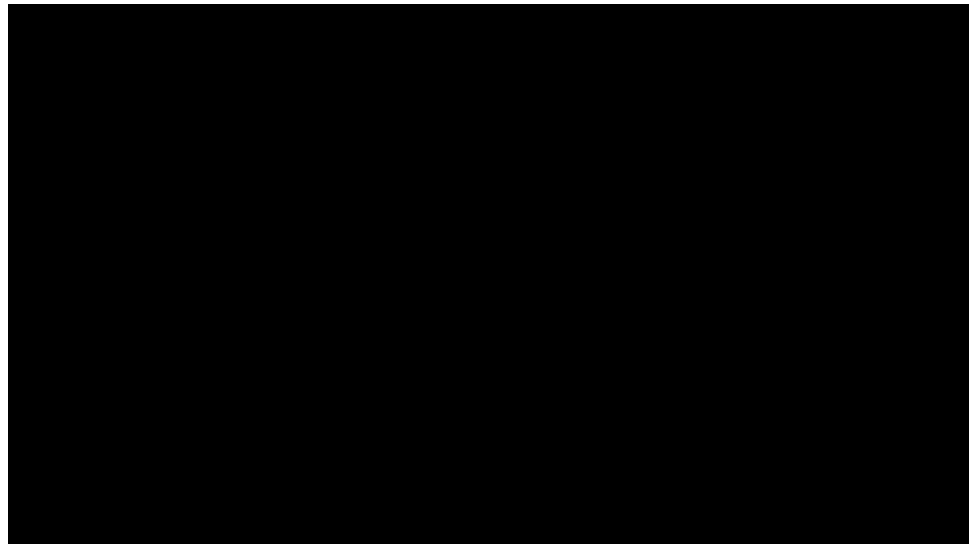
Fear:

- Humanity gets corrupted by technology
- Frankenstein principle. We create something that is destroying ourselves

Blade Runner (1982)

- Pollution and overpopulation
- Androids/Replicants/Clones
 - How to distinguish Replicants from humans?
 - Rick Deckard?

<https://youtu.be/eogplG53Cis>



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