

# The 56<sup>th</sup> Scand-LAS 2026 Conference

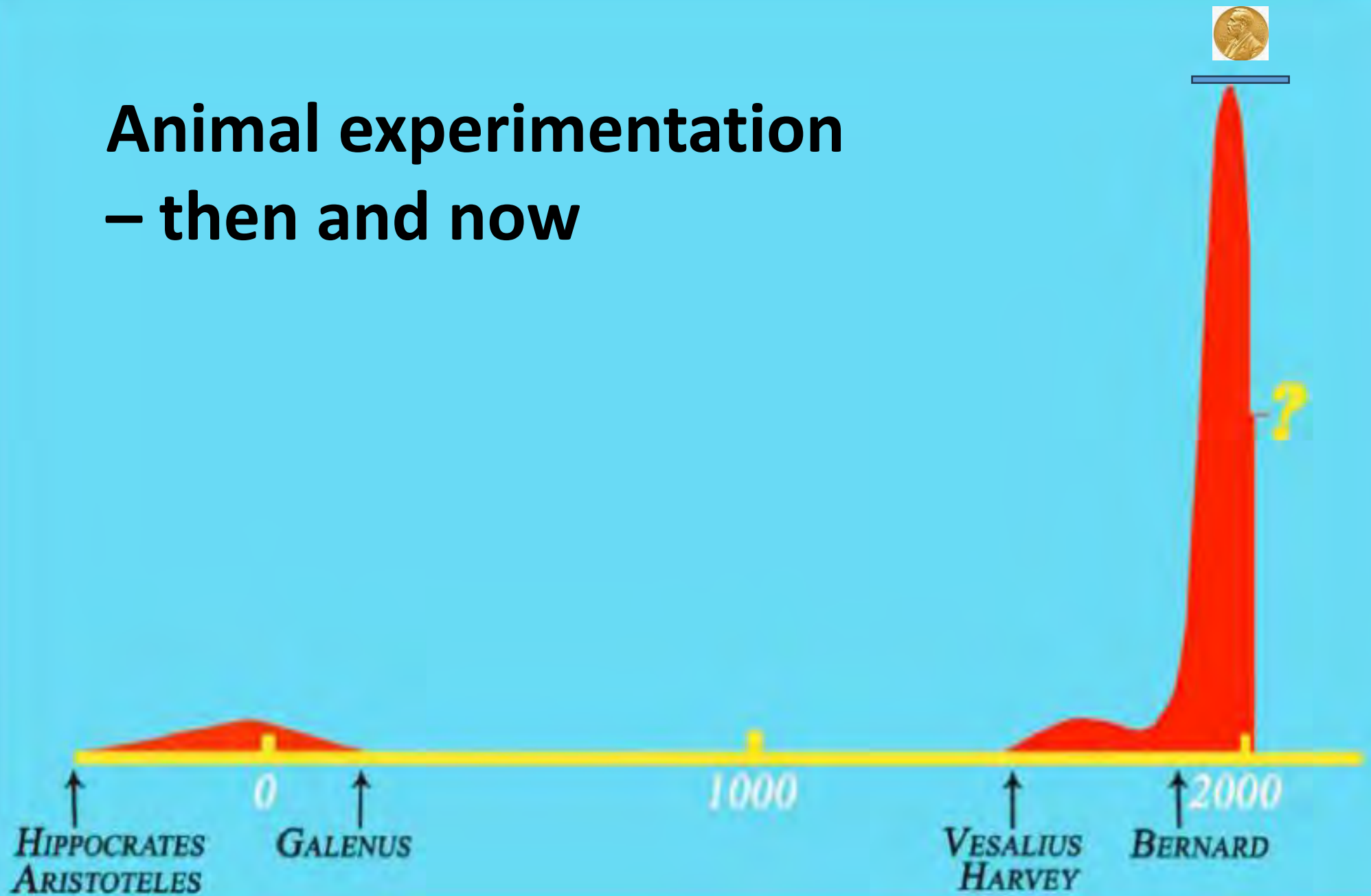
*Taking laboratory animal science to a higher level*

28 May 2026, 15.15-15.40

## The history of using animals for research

(Laika, Sputnik 2, 1957 >)

# Animal experimentation – then and now



# We are committed towards animals, and how should we treat them?

## - An ancient discussion

### 1. Genesis 1,1-2,3:

"In the beginning God created the heavens and the earth ...  
God said, "Let us make man in our image, after our likeness! They shall rule  
the fish of the sea, the birds, the cattle, all the wild animals and every  
creeping thing that creeps on the earth. "So God created man in his image"

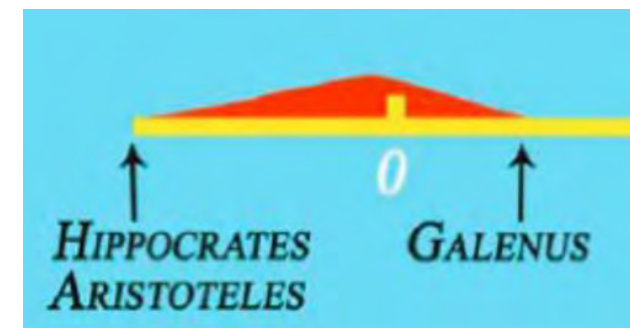
Man is created to be the animals' leader

### 2. Genesis 2,4-2,25:

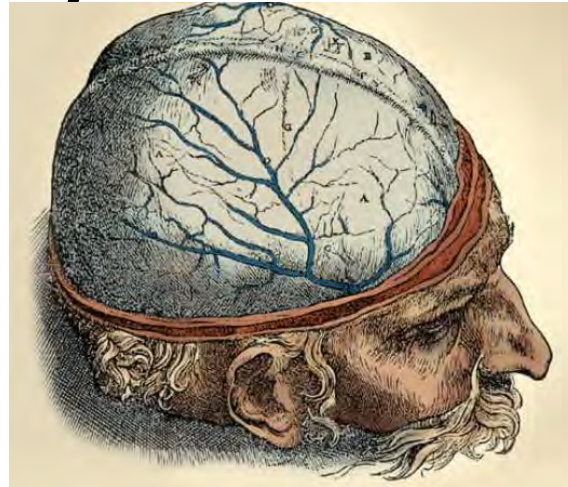
"Lord God said, "It is not good that the man should be alone. I will make him  
an help meet for him". Then the Lord God formed every beast and all the birds  
of the earth, and he brought them to the man to see what he would call them,  
and the man called the living creatures, their name"

The animals (and Eve) was created for man's (Adam's) fault

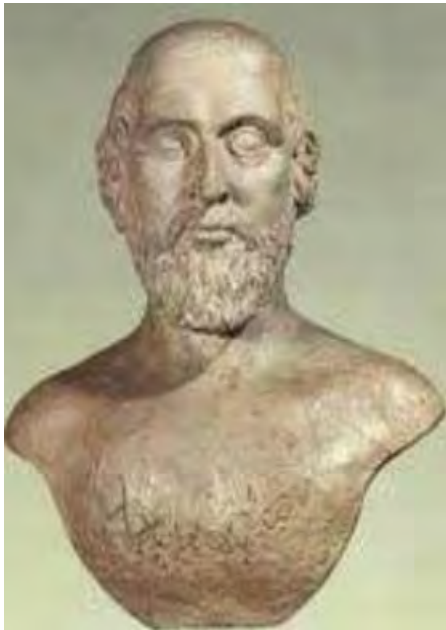
# Greek and Roman Antiquity (800 BC – 500 AD)



sensory input



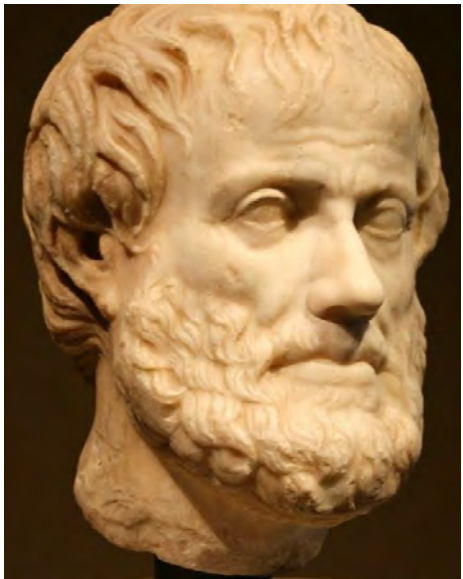
motor output



Akmaeon of Croton (510 BC) in Greece

Galenus (129-200 AD) in Rome

# Roman and Greek Antiquity (800 BC – 500 AD)



Aristotle (384-322 BC):  
*Historia animalium*



Scala Natura



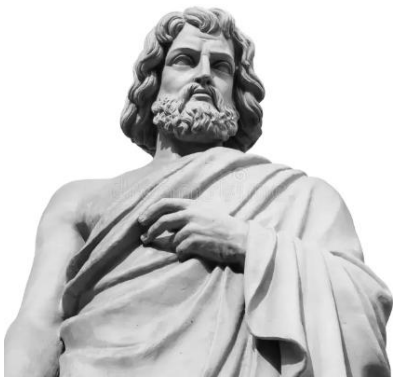
St Thomas Aquinas  
(1225-1274 AD):  
**Scala Natura**



# Aristotle (384-322 BC)

Animals' existence  
(telos):

*"We must suppose that nature also provides for them in a similar way when grown up, and **that plants exist for the sake of animals and the other animals for the good of man, the domestic species both for his service and for his food, and if not all at all events most of the wild ones for the sake of his food and of his supplies of other kinds, in order that they may furnish him both with clothing and with other appliance. If therefore nature makes nothing without purpose or in vain, it follows that nature has made all the animals for the sake of men**"* (Politics, book 1)



# Telos/Scala Natura

God

Angels

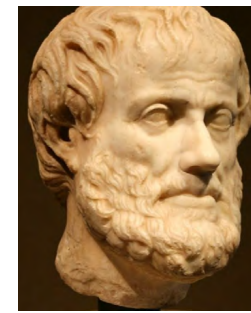
Human beings

Animals

- Whales, seals
- Other mammals
- Birds
- Amphibians and most reptiles
- Snakes
- Fish
- Octopus and squids
- Crustacean (lobster, crab etc)
- Insects and spiders
- Mollusks, echinoderms
- Gobblers, mushrooms etc

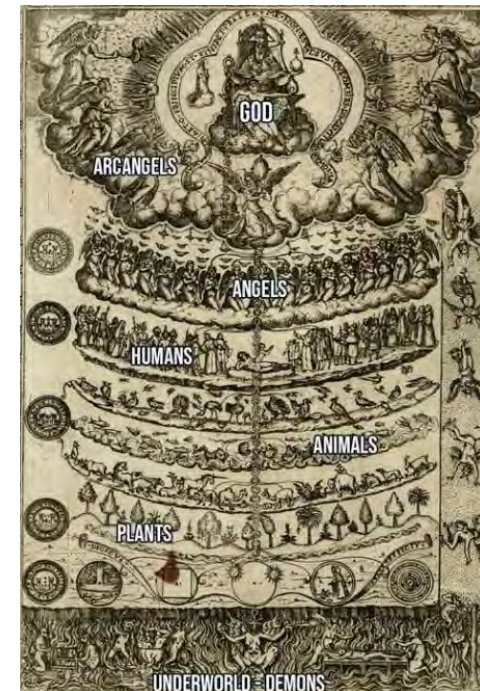
Plants

Minerals, soil, etc



Blood      Viviparum      Ovumparum

+	+	-
+	+	-
+	-	+
+	-	+
+	-	+
+	-	+
-		
-		
-		
-		
-		



# Theophrastus

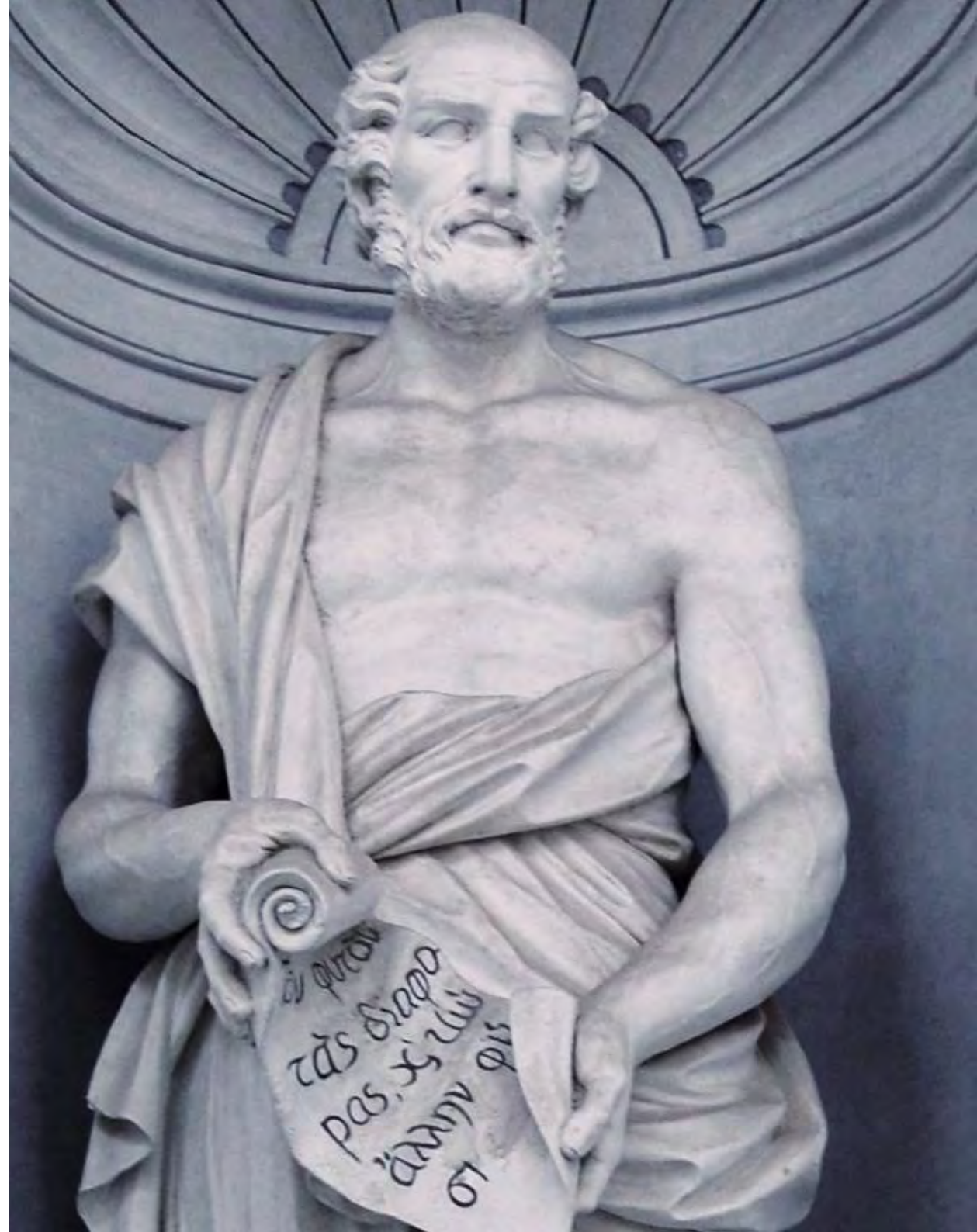
(372-287 BC)

Student and successor of Aristotle

Largely carries forward the philosophy of Aristotle

However, rejects Aristotle's exclusion of animals from the moral community

*"Animal share a kinship with man, so that it is unjust to kill them"*

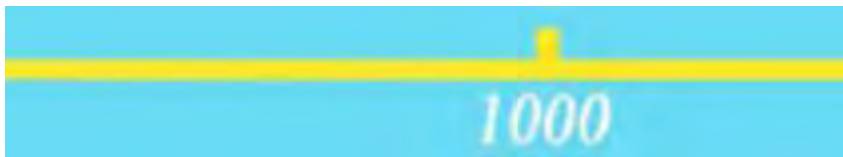


Muslim animal experiments in the Middle Ages:

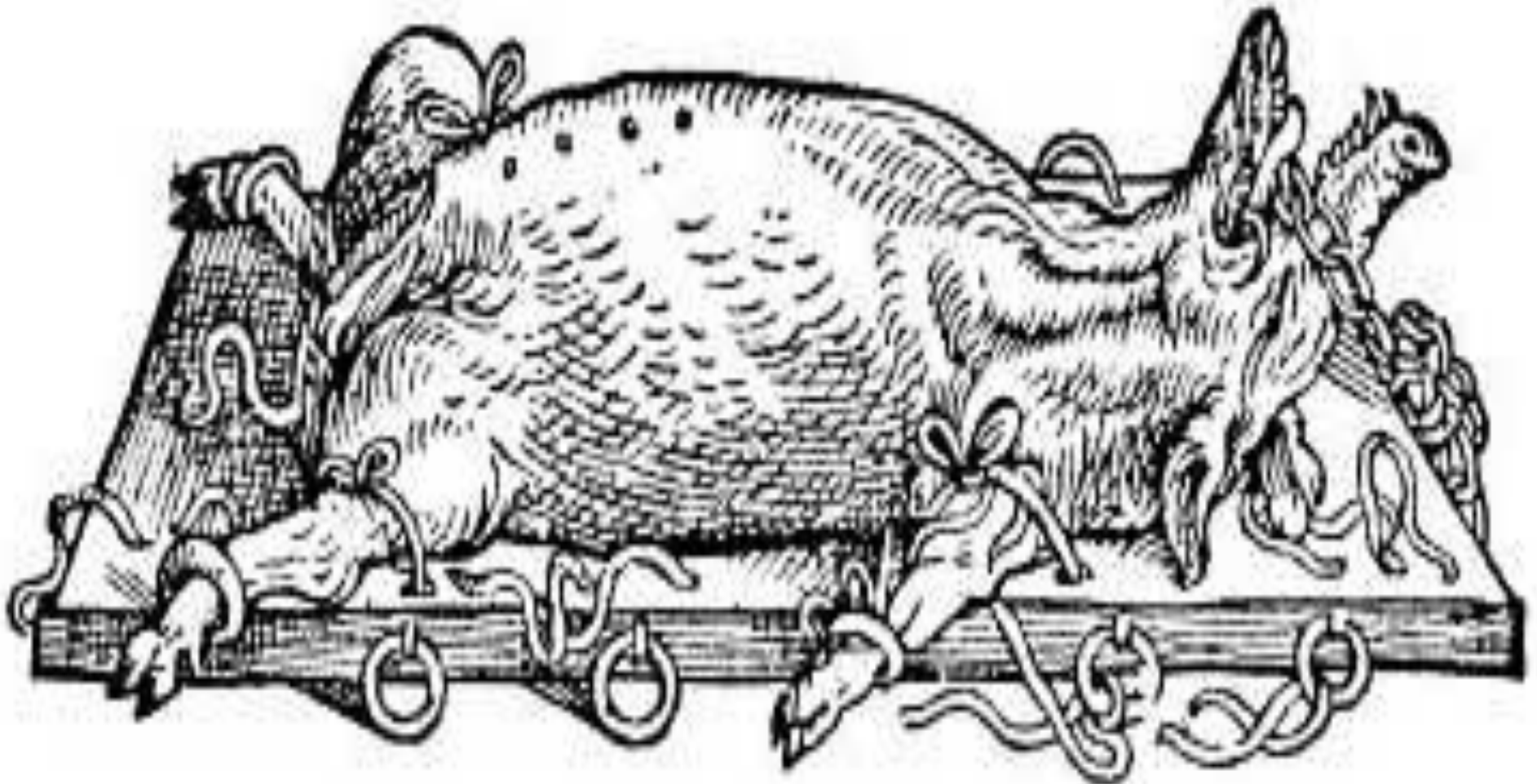
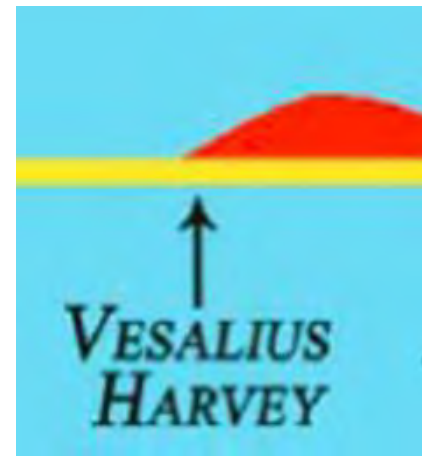
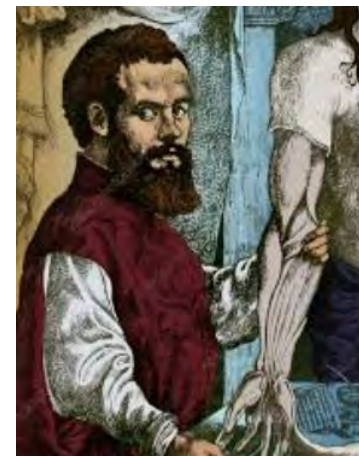
# Tracheostomy in goats



**Ibn Zuhr** (1094-1162)

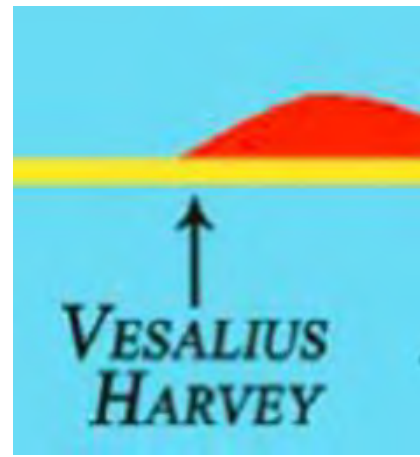
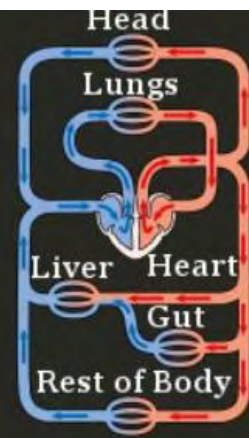


Andreas Vesalius (1514-1564)  
"De Humani Corporis Fabrica" (1542)

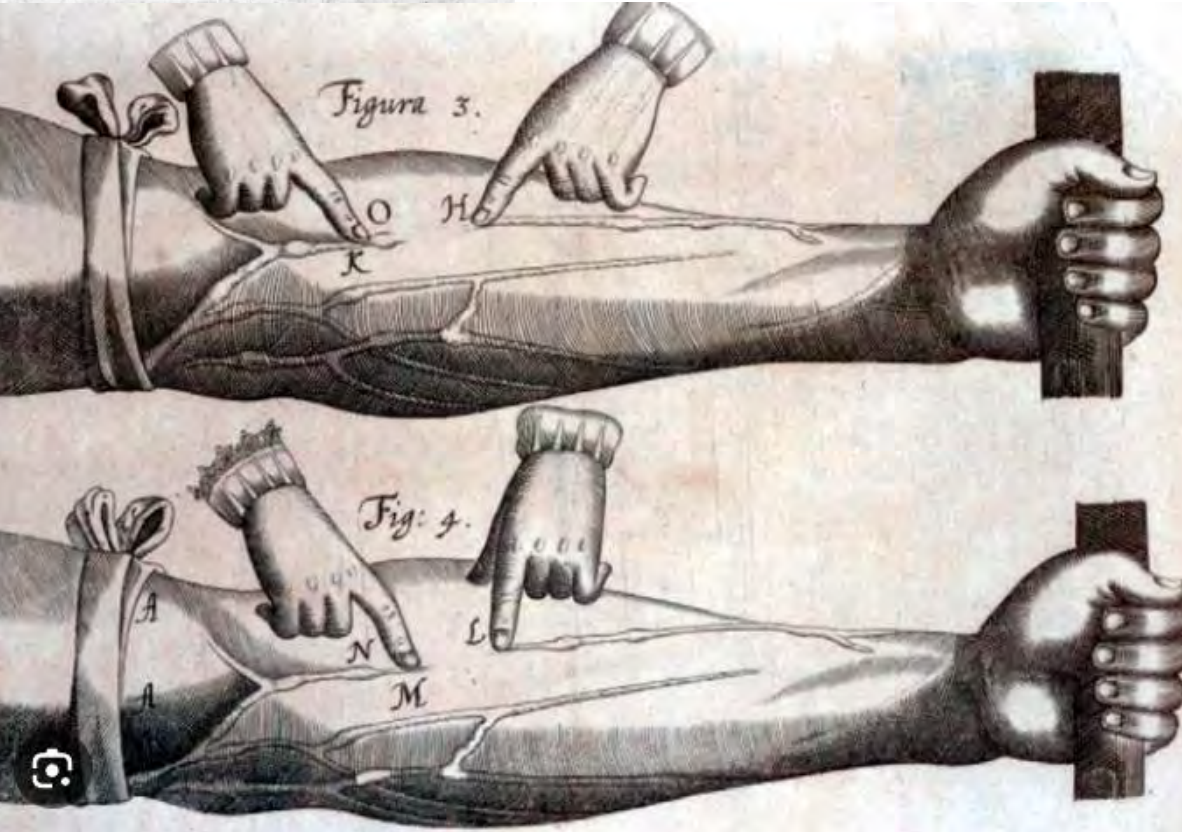


# William Harvey

(1578-1657)



*"Excercitatio Anatomica de Motu Cordis et Sanguines in Animalibus"*, 1628



# Substantial dualism in the Renaissance (Rene Descartes)

- animals are only mechanical devices with no soul

Animals are mechanical devices as no feelings have, but apparently works as if they had



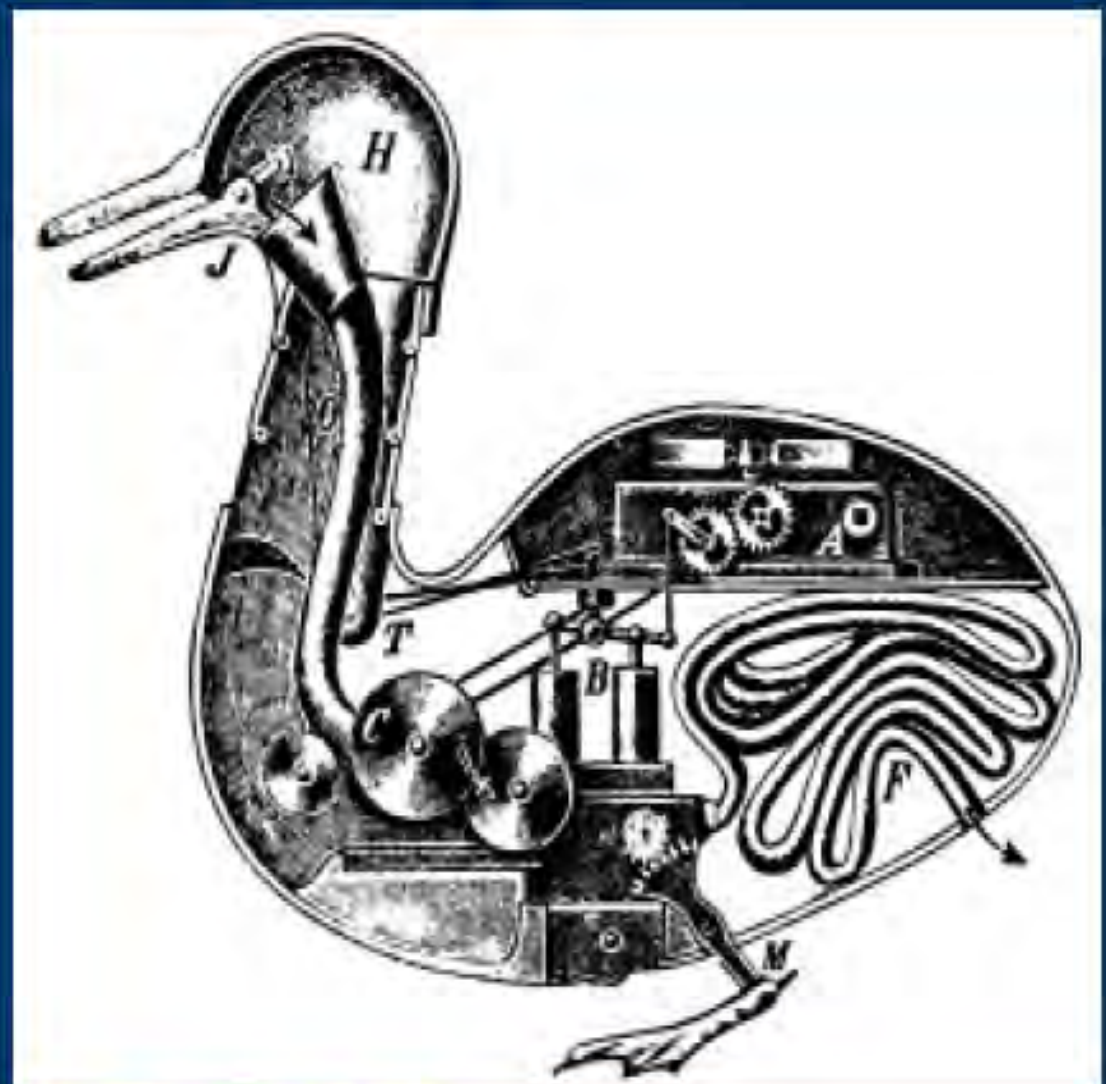
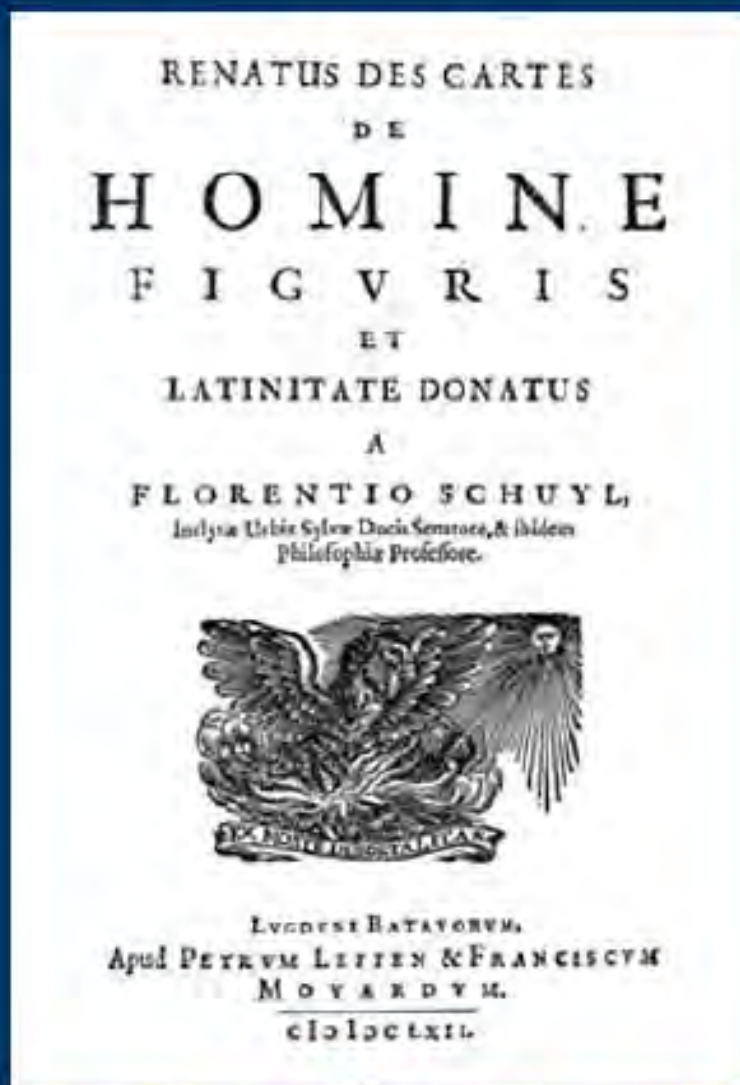
Rene Descartes  
(1596-1650)

## Vivisection of a cat:

*Descartes explained that the cat nothing felt it was dead chemistry. The sounds could be compared with the sound a bell gave when you tapped it*

Descartes - animals are mechanical with no soul

## From "Automata" (1662)



Animals as self-operating machines (a digesting duck)

"The question is not,  
Can they reason?  
nor, Can they talk?  
But, Can they suffer?"



**Rene Descartes**  
(1596-1650)



**Jeremy Bentham**  
(1748-1832)



← Monsieur Grat  
(= "Mister Scratch")

"The question is not,  
Can they reason?  
nor, Can they talk?  
But, Can they suffer?"



**Rene Descartes**  
(1596-1650)



**Jeremy Bentham**  
(1748-1832)



## Frederik Christian Eilschov

(1725-1750)

Danish philosopher defended animal rights

He focused on animals and advocated for animal protection

He believed that animal psychology should be subject to scientific study

He believed that animals had feelings that could be heard in grunts (pigs)



From: 'Philosophiske Breve - Over adskillige nyttige og vigtige Ting', 1748.

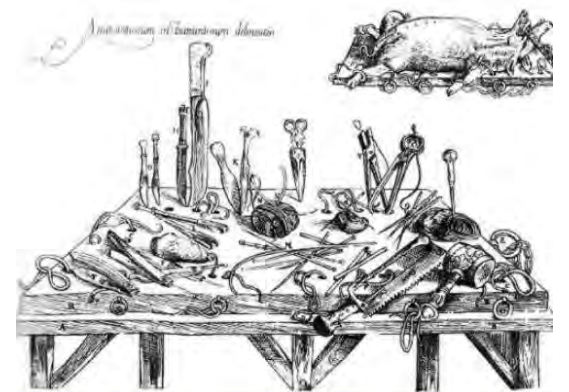
# Marshall Hall – long time before 3R

(1790-1857)

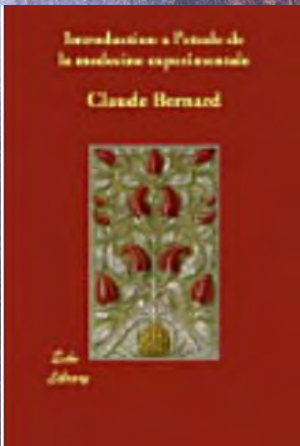
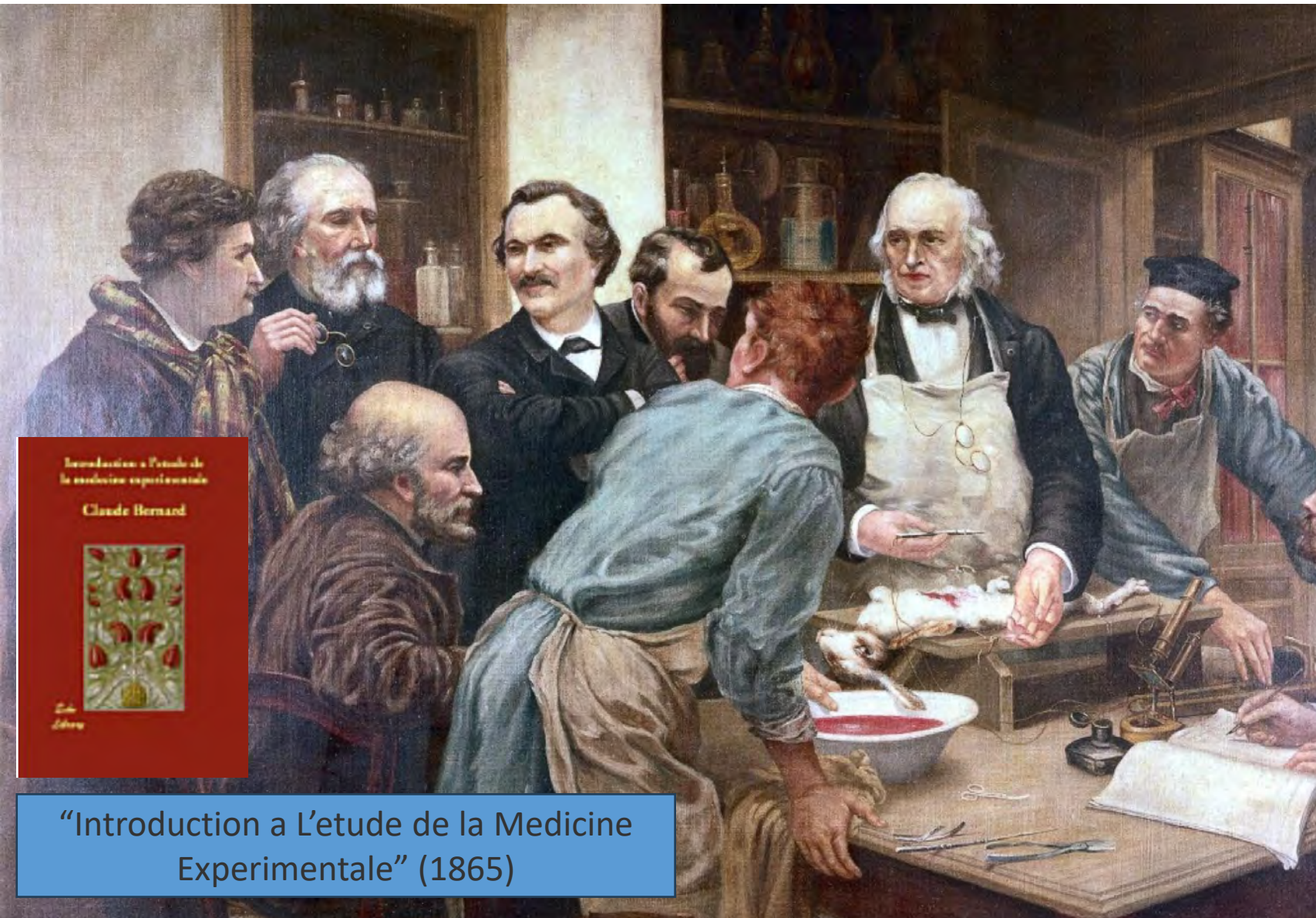
The five principles for use of laboratory animals:

1. An experiment should never be performed if the necessary information could be obtained by observations = **early replacement**
2. No experiment should be performed without a clearly defined and obtainable, objective
3. Scientists should be well-informed about the work of their predecessors and peers to avoid unnecessary repetition of an experiment = **early reduction**
4. Justifiable experiments should be carried out with the least possible infliction of suffering (often through the use of lower, less sentient animals) = **early refinement**
5. Every experiment should be performed under circumstances that would provide the clearest possible results, thereby diminishing the need for repetition of experiments

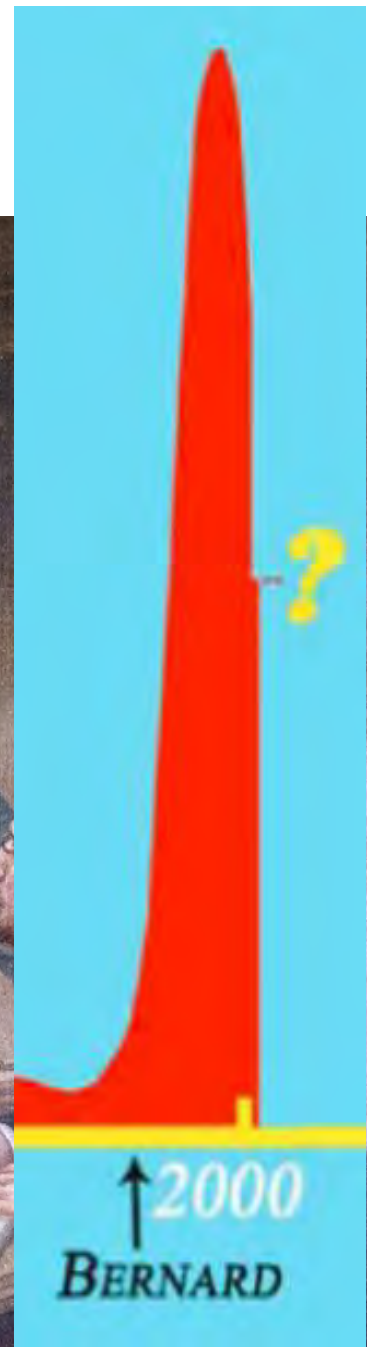
(Principles of Investigation in Physiology, 1835)



# The founder of modern laboratory animal science, Claude Bernard (1813-1878)



“Introduction a L'étude de la Medicine Experimentale” (1865)



His wife and daughter left him in protest against his work!

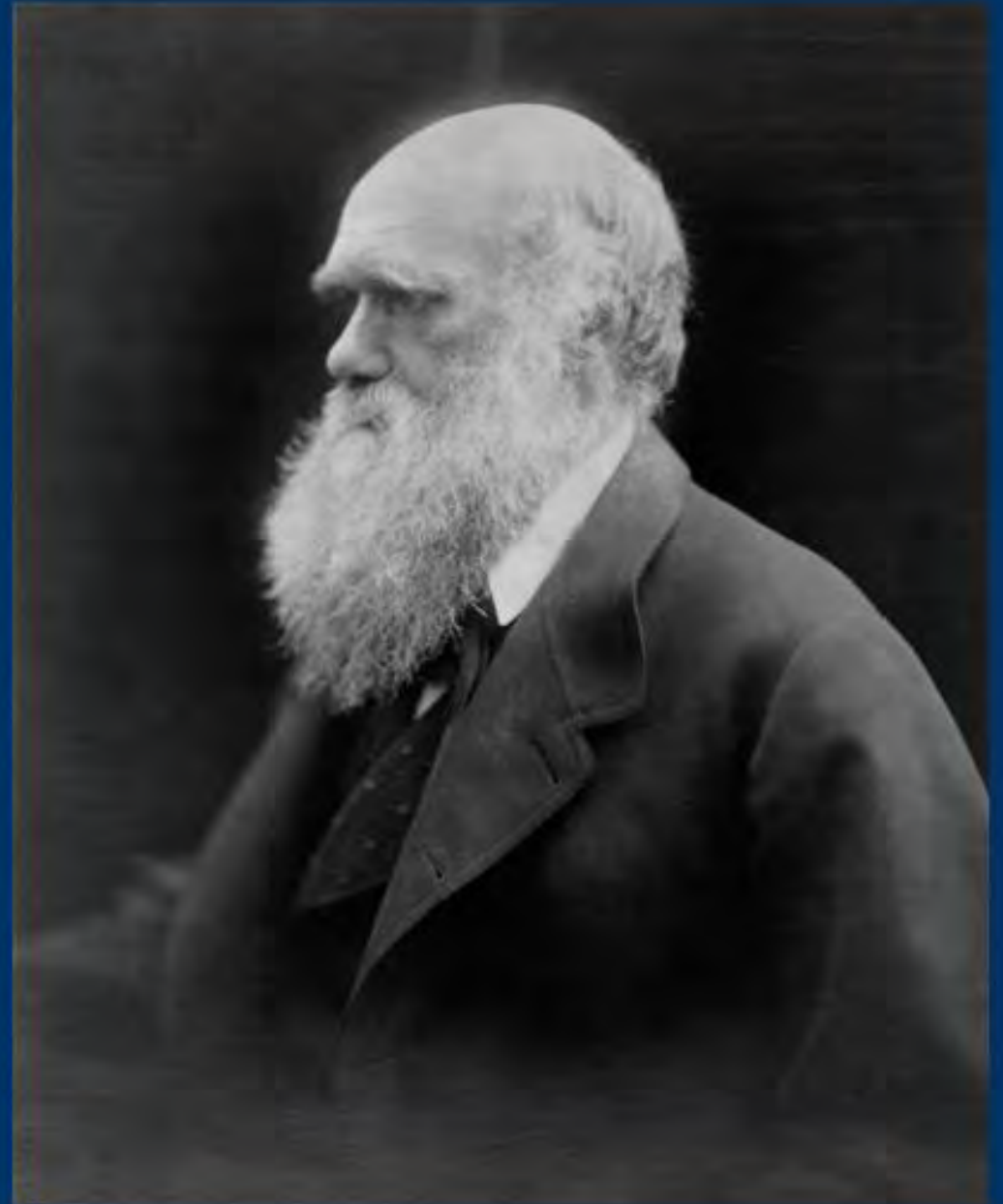
# From Scala Natura (& Systema Natura) to Evolution

ON  
**THE ORIGIN OF SPECIES**  
BY MEANS OF NATURAL SELECTION,  
OR THE  
PRESERVATION OF FAVOURED RACES IN THE STRUGGLE  
FOR LIFE.

By CHARLES DARWIN, M.A.,  
FELLOW OF THE ROYAL, GEOLOGICAL, LYNNEAN, ETC., SOCIETIES;  
AUTHOR OF 'JOURNAL OF RESEARCHES DURING H. M. S. BEAGLE'S VOYAGE  
ROUND THE WORLD.'

LONDON:  
JOHN MURRAY, ALBEMARLE STREET.  
1859.

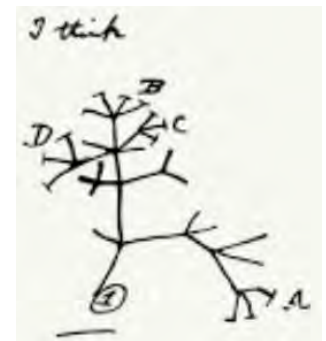
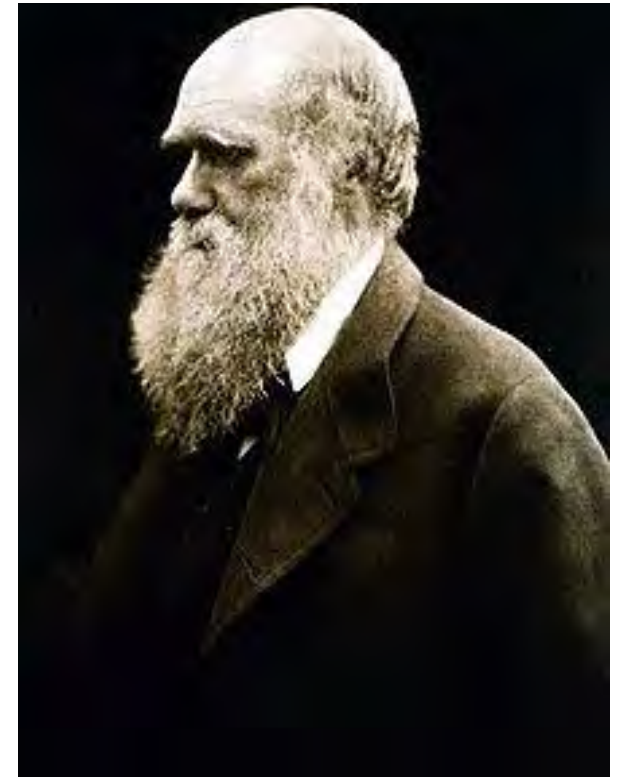
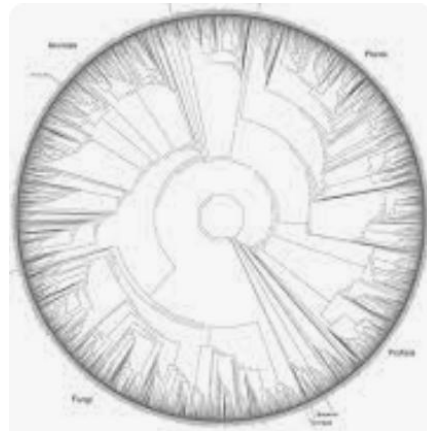
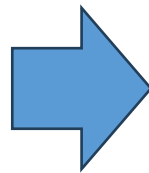
*The right of Translation is reserved.*



# Charles Darwin about laboratory animals

*“There is no fundamental difference between man and the higher mammals in their mental faculties”*

Charles Darwin (The Descent of Man, 1871)



*“You ask about my opinion on **vivisection**. I quite agree that it is justifiable for real investigations on physiology; but not for mere damnable and detestable curiosity. It is a subject which **makes me sick with horror**, so I will not say another word about it, else I shall not sleep to-night”* Charles Darwin (letter, 1875)

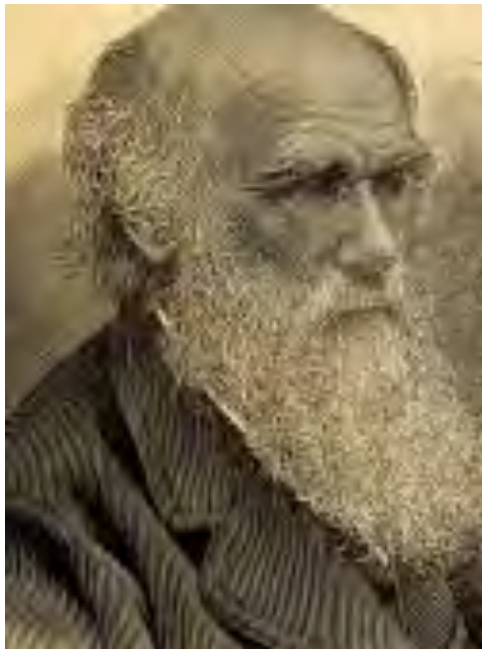
# Towards national legislation on animal testing

## United Kingdom

National Antivivisection Society (1875)

Charles Darwin publicly defends animal testing (1875)

First country with legislation (1876)



## Denmark

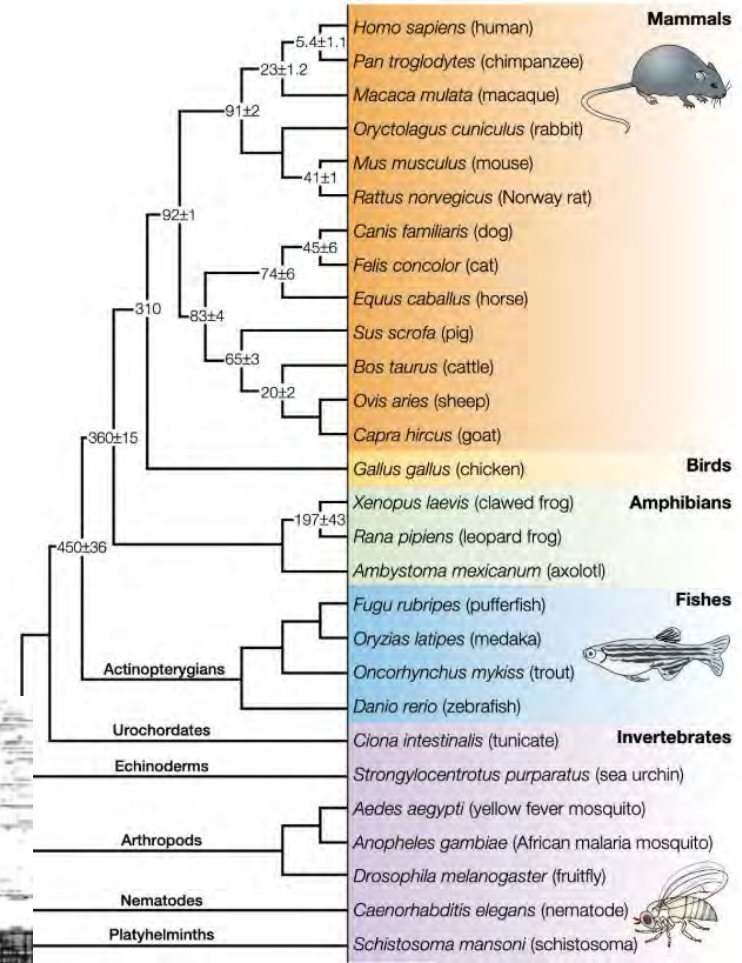
Dyrenes beskyttelse (1875)

Peter Panum also defends (1879)

Second countries with legislation (1891)



# From Mendel's peas to living rodents



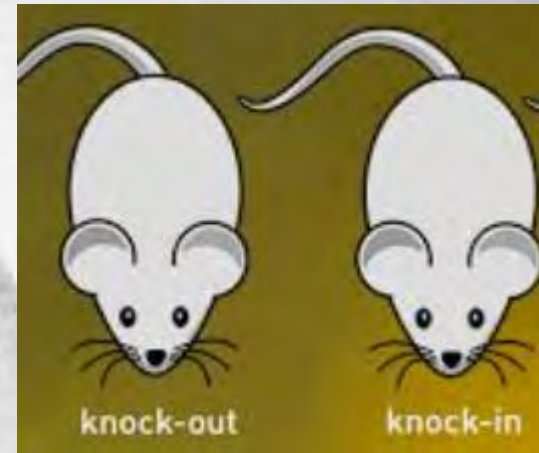
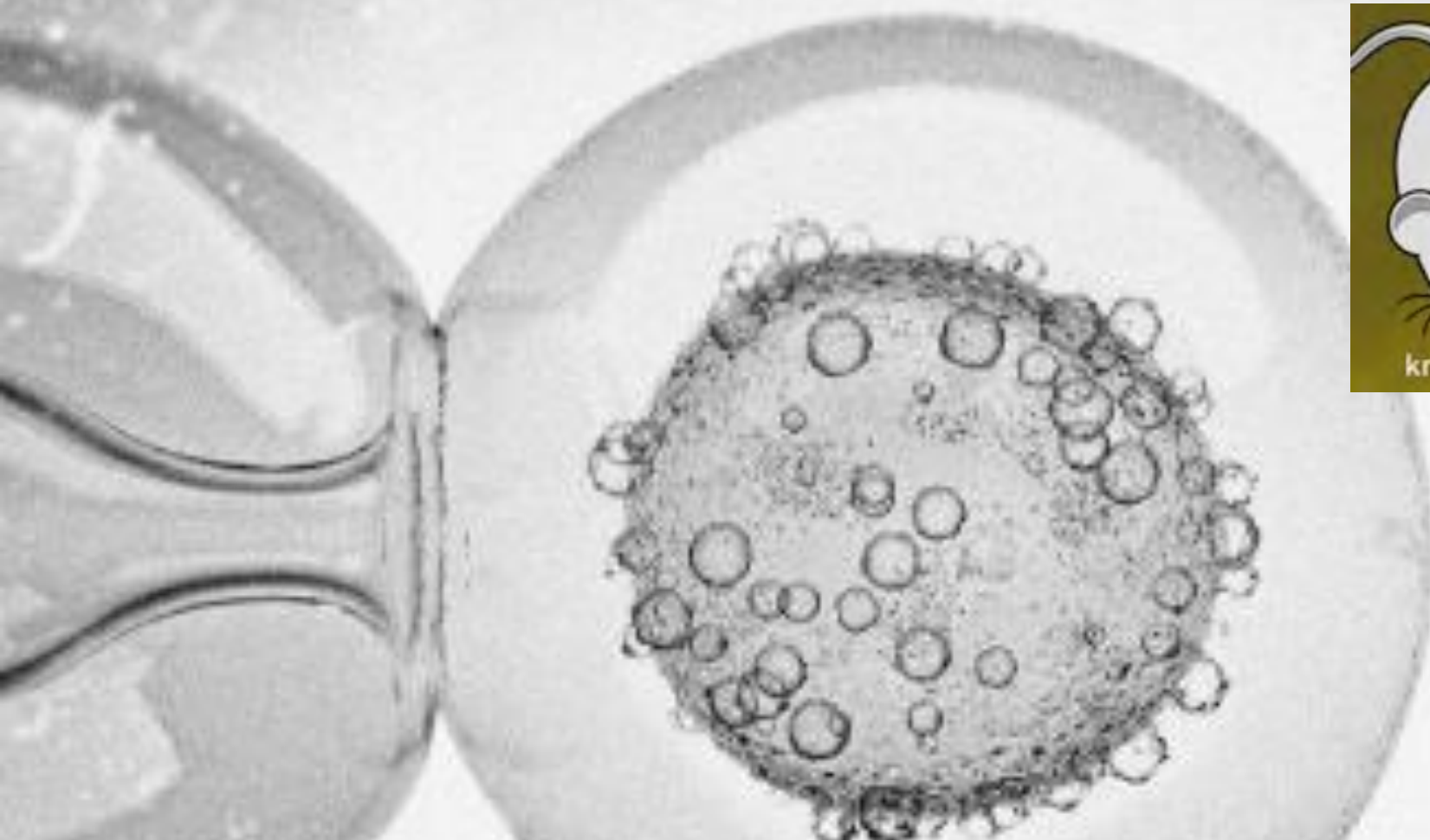
Mammary tumors:  
strain and  
ovariectomy



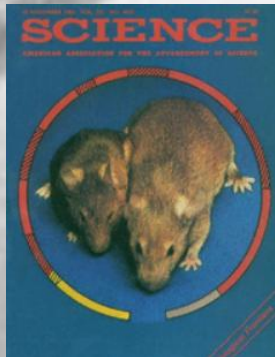
**Abbie Lathrop**  
(1868-1918)

Strain	Sex	Age	Notes
5-2-18	F	4	26
5-2-18	F	5	63 horse down
5-2-18	F	4	73
5-2-18	F	3	77 mouse
5-2-18	F	3	91
5-7-18	F	4	107
5-7-18	F	2	112
5-23-18	F	3	159
5-23-18	F	4	166
5-2-18	F	5	172
5-8-18	F	4	175
5-2-18	F	3	180
5-2-18	F?	?	182
5-2-18	F?	(1)	208
5-24-18	F?	?	209
5-24-18	F	3	227
5-24-18	F	4	233
4-24-18	F	4	236
5-2-18	F	4	238 to 392
4-25-18	F	2	243

# Transgenic evolution in experimental animal science



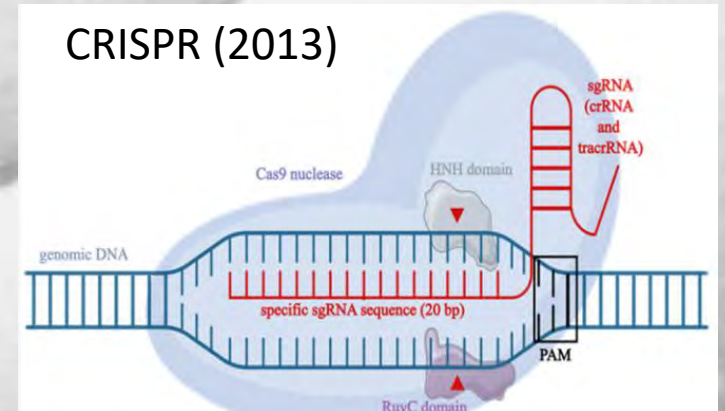
Embryonic stem cell (ESC) techniques (1981)



Somatic cloning (1997)



CRISPR (2013)



LAS are more than rodents!

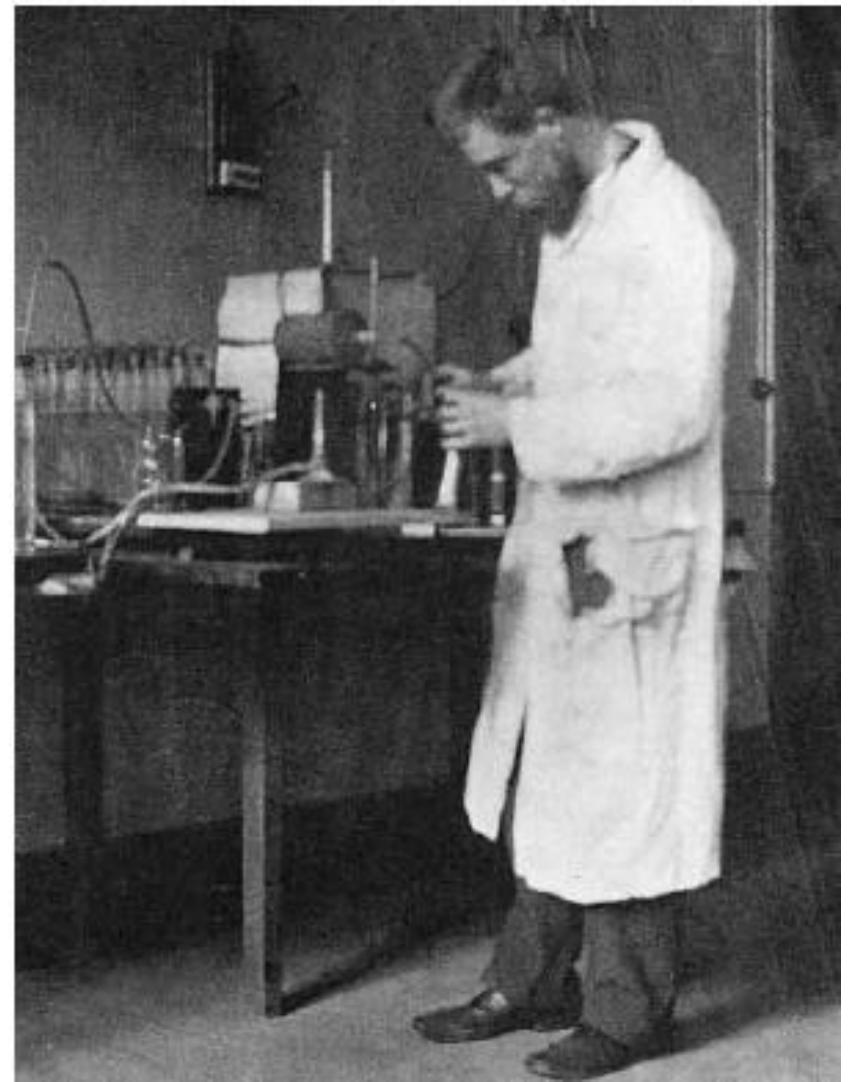
## August Krogh Principles

Nobel Prize 1920

*”Define the problem, then pick the study species!”*

*”For every defined physiological problem, there is an optimally suited animal that would most efficiently yield an answer”*

(August Krogh, 1929)



August Krogh (1874-1949)



**Karen Blixen**  
(1885-1962)

*"The animals are given into our hands, even more defenseless than the kids. It is for our dignity, for our good name in the universe - for our honor's sake, if you will - that we must not leave them without legal rights. For it is an important matter to preserve life. But it is even more important to make life worth preserving"*

(23 April 1951 at Aarhus University)



# The 3R era from 1959

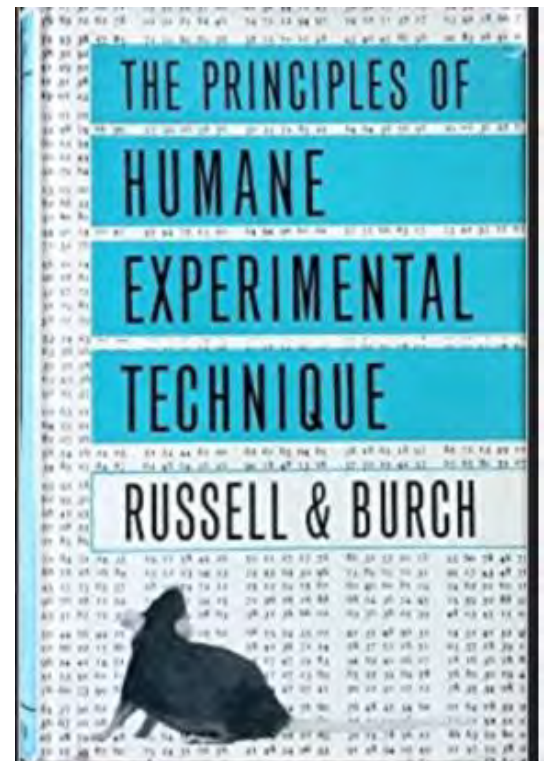
William Russell (1925-2006) & Rex Burch (1926-1996):  
*"The Principles of Humane Experimental Technique"*

Fathers of the 3R-concept

*"Humane science" to be the "best science"*

Going so far as to state that:

*"If we are to use a criterion for choosing experiments to perform, the criterion of humanity is the best we could possibly invent"*



Thanks for listening...!



The Vacanti mouse with a human-ear-shaped piece of cartilage growing out of its back