



Fish Ethics



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Why is fish ethics important?

- Commercial Fisheries
- Aquaculture
- Recreational Fishing
- Research
- Education
- Pets
- Biodiversity



Zebrafish

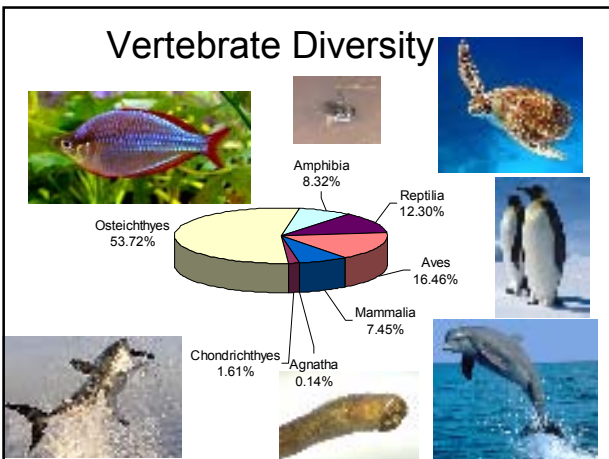


Stickleback



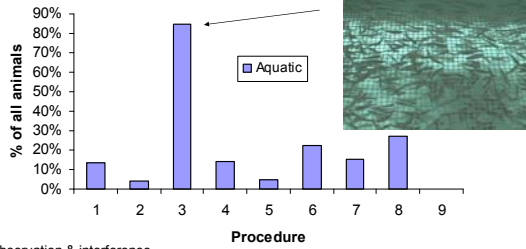
Guppy

Vertebrate Diversity



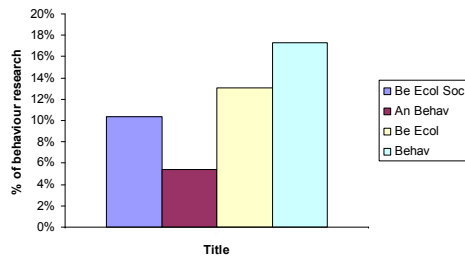
How many fish in research?

Animal use in research 2006



- 1 Observation & interference
- 2 Animal unconscious no recovery
- 3 Minor conscious intervention
- 4 Minor surgery with recovery
- 5 Major surgery with recovery
- 6 Minor physiological challenge
- 7 Major physiological challenge
- 8 Death as an endpoint
- 9 GM animals

Number of fish papers in behaviour

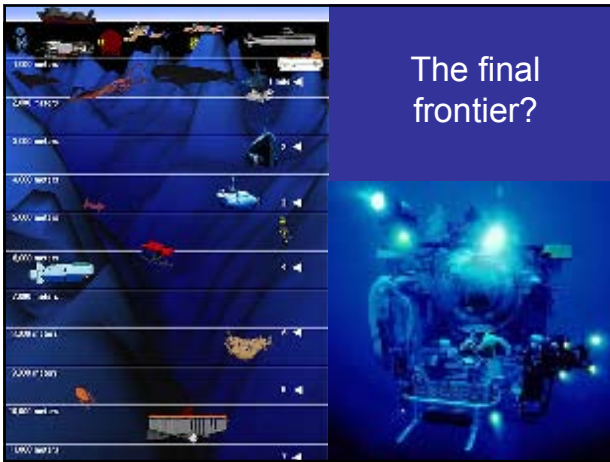


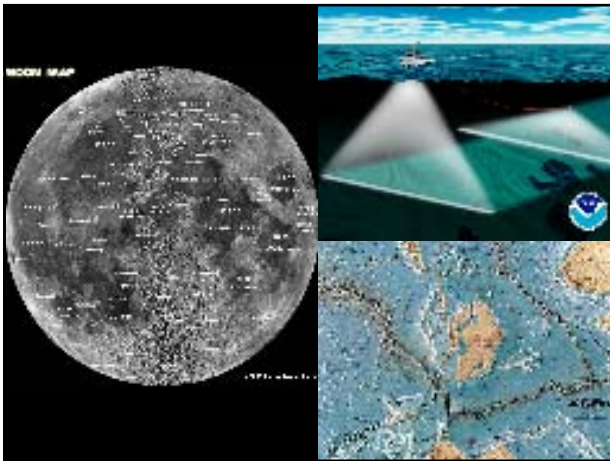
Fish live in water!

71% of the Earth is covered in water



Average depth 3790m





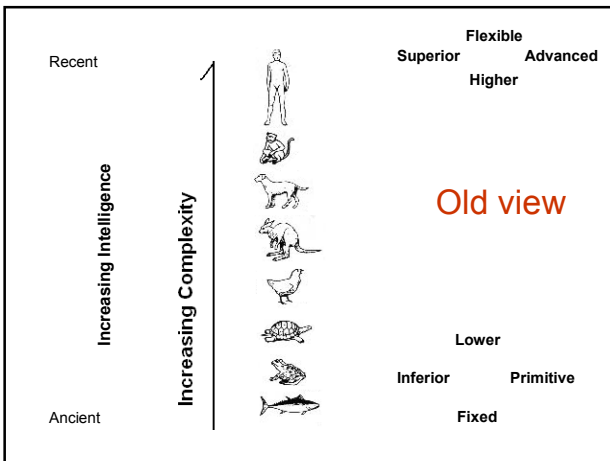
Bad Press

- Goldfish have a 3 second memory

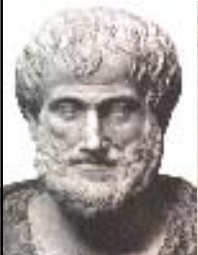



Fish; the other white tofu?!

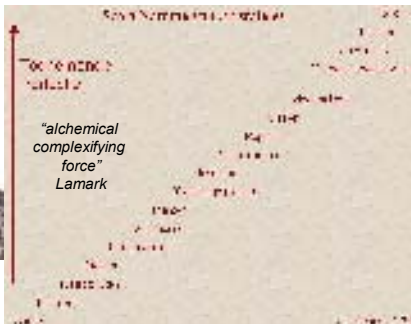




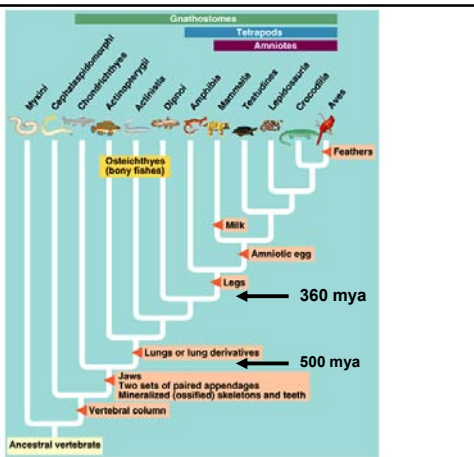
Scala naturae



Aristotle
(384 BC – 322 BC)



Modern view

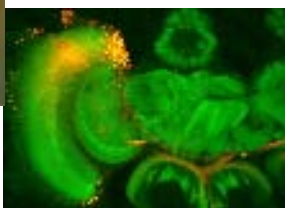




No brain is structurally simple



Even a bee brain has ca1 million interconnected neurons!

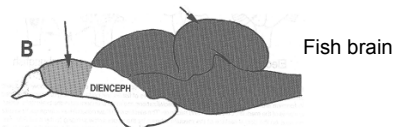
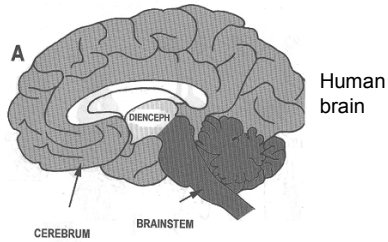
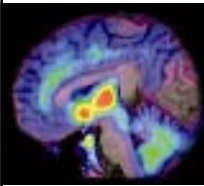


Do fish feel pain ?

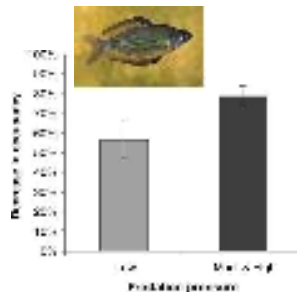


Physical & Emotional

Do fish feel pain ?



Fish avoid negative stimuli



Chemical and visual communication

Normal behaviour Fright response

Minnows responding to "shreckstoff" – "scary stuff"

von Frisch K. (1938) Die Naturwissenschaften 37, 601–606

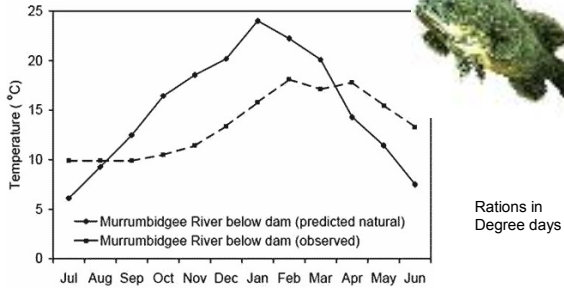
Fish are not Rats

Hot fish, cold fish: how much food?

Desert Goby
+ 40 C

Ice fish
-2 C

Season variation in Temp



Rations in Degree days

Water quality

Companions



Guppies do very well in high densities

Single housing -> stress



Silver perch will kill other companions

Group housing -> stress

General housing



Catfish wallowing in mud!



Charr in cool, clear running water

Substrate



Behavioural requirements

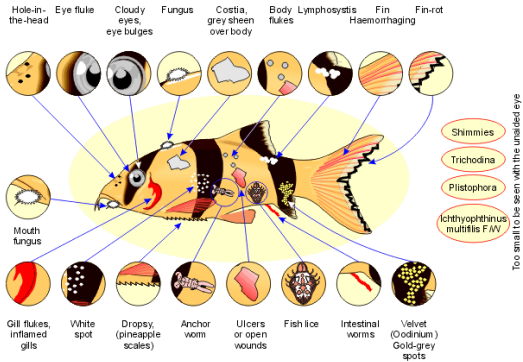


Male stickleback building a nest



Salmon migrating to home rivers

Disease



Key welfare indicators

- **Changes in colour**
- **Changes in ventilation rate**
- **Changes in swimming and other behaviour patterns**
- **Reduced food intake**
- **Slow growth**
- **Loss of condition**
- **Morphological abnormalities**
- **Injury**
- **Disease**
- **Reduced reproduction**

Further Reading

- Huntingford *et al.* (2006) Current understanding on fish welfare: a broad overview. *Journal of Fish Biology* 68, 332-372
- Chandroo *et al.* (2004) An evaluation of current perspectives on consciousness and pain in fishes. *Fish & Fisheries* 5, 281-295.
- <http://www.fsbi.org.uk/docs/brief-welfare-refs.pdf>
- <http://www.fishwelfare.net>
