# Other Species as Bush Mechanics/Artificers

Today we realise we share the globe with many species we define as 'conscious'. For instance using the mirror test. As this recognition slowly dawns on us we need to move to recognising this and granting them 'non-human personhood' as has recently been done in Argentina with an Orangutan ( http://www.independent.co.uk/news/world/americas/sandra-the-orangutan-inside-argentina-zoo-granted-human-rights-in-landmark-ruling-9940202.html , this can accompany the rapidly developing arena of Robot Rights as many futurists have been writing about for going on a generation [McNally and Inayatullah 1988, Wildman 1999, Wildman 2000]. It may well be that we as a Western culture give rights to robots before we do to our own ilk!!! How telling in terms of our disregard for our home planet and its inhabitants.

Recognition of consciousness in species presently depends on the mirror test outlined below.

**The Mirror Test:** Developed in the 1970s, the experimenter discreetly marks the animal with a coloured dye, or puts a coloured dot on their forehead. The animal is then presented with a mirror and their reaction is observed.

If an animal is self-aware they'll turn and adjust their body to get a better view and touch the coloured spot or try to remove it. This proves that the animal understands the reflection is its own.

Species that passed the Mirror Test

**Mammals** – Elephant, Primates – Bonobo, Chimp, Orangutan, Gorilla, Human (from 18mths);
**Cetaceans** – Bottlenose dolphin, Killer whales, Orcas
**Birds** – Magpie, Crow (Raven family), Scrub Jay

This list is illustrative and not exhaustive. Below are two such examples from the Bird family.

# Birds plan treats for the future

Maggie Fox Thursday, 22 February 2007
http://www.abc.net.au/science/news/stories/2007/1853946.htm?enviro
Reuters

Birds can plan to save tasty food for the future and do it in a way that shows they truly plan ahead, UK researchers report.

They set up an experiment to allow the scrub jays hide food in a certain way if they are indeed planning, and found the birds were up to the task.

Their study, published today in the journal *Nature*, adds to several others that show animals such as great apes and certain birds can plan ahead in much the same way as people.

"Knowledge of and planning for the future is a complex skill that is considered by many to be uniquely human," write Professor Nicola Clayton and colleagues at the University of Cambridge.

Scrub jays can plan future meals in much the same way as humans *(Image: Arizona Game & Fish)*

"We show that the jays make provision for a future need, both by preferentially caching food in a place in which they have learned that they will be hungry the following morning and by differentially storing a particular food in a place in which that type of food will not be available the next morning," the researchers add.

The jays were kept in large cages with two rooms and were moved from one compartment to another depending on the time of day.

They also got different types of their favourite food: ground-up pine nuts, which they could not store, and peanuts and dog kibble, which they could.

First the researchers fed the birds on a schedule, with breakfast served in one compartment but not the other. Then they threw the birds off schedule by unexpectedly feeding them in the evening.

The birds stored more food if they got this surprise evening meal in the compartment where they usually were not fed than if they got the night treat in the 'breakfast room', Clayton's team reports.

**Planning ahead**

In a second experiment, the birds got breakfast in both rooms but peanuts only in one and dog kibble only in the other. Then they got a chance to hide both types of food anywhere they

liked.

They hid dog food in the peanut compartment and vice versa, the researchers saw.

"The results described here suggest that the jays can spontaneously plan for tomorrow without reference to their current motivational state, thereby challenging the idea that this is a uniquely human ability," Clayton's team argues.

Professor Sara Shettleworth of the University of Toronto in Canada agrees.

"Two requirements for genuine future planning are that the behaviour involved should be a novel action, or combination of actions (thus ruling out migrating and hibernating), and that it should be appropriate to a motivational state other than the one the animal is in at that moment," she writes in a commentary in the same issue of the journal.

So the animals must not be acting out of immediate hunger, for instance.

She says Clayton's experiment is the first to unambiguously fulfil both requirements.

**Birds hide their food**

Last May, a team led by Dr Joanna Dally of the University of Cambridge reported that scrub jays remembered which other birds were watching them when they first hid some treats. They then changed the hiding places if there was a chance the other birds could steal the food.

Jays are members of a group of birds called corvids, which include crows, jays and ravens. Biologists consider them to be the most intelligent birds.

Also last May, German researchers from the Max Planck Institute for Evolutionary Anthropology found that bonobos, close relatives of chimpanzees, and orangutans could plan and use tools.

Also:

## From Bird Mechanics to Bush Mechanics and back again – outlining some facets of action oriented animal-artificer learning and Why Artificer Learning and Animal Learning have a lot to learn from each other

The first 5 criteria listed below are criteria used by animal researchers into animal learning – which is a good way to go for artificer learning for the reasons that since animals cant speak or write we cant make the fatal error of setting up Schools and Universities who then separate thinking and doing and advocate that learning is exclusively about thinking and subsequently writing this down. That is learning is intellectual not based on efficacious action.

The only way we can speak of animal learning is about doing and seeing if this doing is a result of some sort of learning process and results in an overall benefit to the species. This however is not old fashioned Skinnerian – stimulus – response - behaviourism – a process that excludes learning and cognition by the particular animal, rather it is about animal

intelligence in the conception, design and implementing and passing this on (social learning) tool design.

**Artificer learning and Animal learning criteria – Bush Mechanics and Bird Mechanics (as Bob Dicks post indicates) have indeed much in common.**
We are following a number of different lines of investigation to try to find out what is so special about action-oriented learning, which, is practiced by many species such as hominoids and crows. These can be broadly divided into criteria along five main lines:

1. **Selectivity** - do the species flexibly use particular tools, which are appropriate to the current task?
2. **Cognition** - do the species understand the basic (physics that underlie) relations between objects, and what are the limits on this cognition?
3. **'D'esign** – does the species response evidence a
   Cognition | Design/Adapt | Implement/Test process
4. **Social learning** - do the species/learner learn (1) from the use of the tool (2) use skills from other conspecifics, or (3) use skills on their own? And (4) (how) is tool use passed on to other members of the species?
5. **Laterality** - do the species show lateralised tool use?, and
6. **Neurobiology** - are their unusual abilities with tools reflected in differences (separate population groups) in their brain/body structure cp. other members of the species
7. **Design fit** - does the design of the tool developed fit the idea and the need?
8. **Structural integrity** - does the structure built/tool made/innovation developed have the ability to perform its duty?
9. **Tool efficacy** - does the tool developed work? Is it of benefit to the specific individual/species?
10.

# Sources


1. Bob Dicks recent blog post re animal/artificer links

2. For instance re animal learning in crows see:
http://users.ox.ac.uk/~kgroup/tools/introduction.shtml

3. My experience in the artificer learning arena

4. McNally, P. and S. Inayatullah (1988). Rights of Robots. *Futures* 20 **2**: 119-136.
Wildman, P. (1999). Blood Sweat and Gears: Some present implications of cloning and other life futures, in *Australian Rationalist. Autumn 49* . pgs.33-37.
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