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What every shepherd knows
Commentary on **Marino & Merskin** on *Sheep Complexity*

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Abstract: The findings of the research reviewed by Marino & Merskin have been common knowledge to shepherds for millennia. Many of them are also evolutionary necessities for all mammals, especially social ones.

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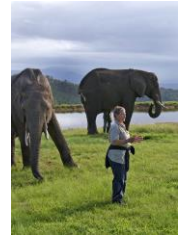
Marino & Merksin (2019) (M&M), or their assistants, have clearly spent many hours reviewing the scientific literature on sheep cognition, intelligence and individuality. When they point out that it has been "discovered" that sheep have a good spatial memory, remember the faces of others, and can learn and remember, one cannot help thinking that if sheep did not have these mammalian mental attributes, it is not clear how they could live, know where they are, eat correct food, find water, etc. All mammals must become good ecologists, able to learn about the environment in which they live and how to adapt to it. This hardly needs proving with experiments. The authors' conclusions reveal no more than what is already known by any half-decent shepherd. (I assume that M&M were not the ones who needed the convincing: that their review of the evidence is intended for the sceptic.) M&M's conclusions are:

1. Sheep have "a number of prefrontal lobe executive functions" that are "on par with primates." Why would they not be? We are, after all, mammals, and have as many mental attributes in common as we have physical and behavioural ones (Kiley-Worthington 2017).

2. Sheep have a "considerable capacity to distinguish and identify faces of other sheep as well as humans." One wonders again why anyone would have supposed otherwise, since sheep are better visual communicators than humans, who concentrate on verbal language to the detriment of visual communication.

3. Sheep, the researchers cited by M&M has discovered, have a range of simple and complex emotions. (What is a "complex emotion"?) Sheep apparently show "judgement bias" (they learn what they want?). They also show forms of "emotional contagion." Well these mental attributes, like most of the others, have been used for centuries by shepherds. Sheep live in an organized society. How could a society work if it were not

organized in some way? In the mammalian case, this is by learning the social contract of that group.

4. Sheep have "distinct personalities." But why would they not have? Surely individual differences — either genetic or the result of lifetime experiences — will occur in sheep as in any other mammal?

5. Sheep have "strong mother-offspring bonds." Midgley (1978) was the first to point out that strong mother-offspring bonds are *characteristic of all mammals*; in fact, this mental attribute has been used to define mammals since Linneus. And, yes, they even show "desire-independent reasoning" (e.g., when hungry they give up eating to join the others). Surely the default hypothesis is not that sheep are robots until experimentally proven otherwise.

I could extract a whole series of quotes from the text to illustrate the points I am making, but perhaps one will do: "Doyle et al. (2011) found that exposure to long-term unpredictable aversive events affected the motivation of sheep to approach a bucket associated with a discrimination task located in a neutral zone during a test. Destrez et al. (2013) found that exposure to chronically stressful situations led to more pessimistic judgement biases and learning deficits in lambs." In other words, if the sheep has had bad experiences before, either with a bucket or other object, they are less likely to approach it! They learn to be careful, just like humans. Does anyone really doubt this? Certainly no one who has ever tried to move sheep anywhere does.

The fact that 90% of the human population now live in towns and have no daily experience with sheep (which includes most scientists and reviewers) may be why common knowledge over centuries concerning the fact that sheep have cognitive aptitudes, intelligence (whatever that is) and personalities, today needs to be pointed out. There is so much more we need to know about the epistemology of nonhuman mammals, even those that live in our stables and by our firesides. It is disappointing to find so much effort, money and time spent on concluding what any good shepherd from Wales, Scotland or even Outer Mongolia knows about the minds of sheep.

To begin to understand what it is to be a sheep, we can and must put together the information we already have from folk knowledge with the experimental or observational science, physiology and neurophysiology, anatomy, lifestyles, social contract theory, and philosophy of mind. But what is it that makes "scientific" studies so much more respectable than folk knowledge when it comes to understanding another's epistemology? This question is not addressed by M&M; and there is no suggestion that their conclusions concern the common mental homologies of all mammals who can see, hear, feel, touch and smell.

There are one or two interesting experimental results, for example, concerning the ability of sheep to know and demonstrate when they have solved a problem. But what about "theory of mind," episodic memory and sentience itself? Self-awareness is focused on mirror tests. But what about the awareness of their own body that is necessary (if they suffer pain), whether or not sheep are "reflectively self-aware"? This would open up the much more interesting debates as to whether sheep feel guilt, shame or embarrassment, for example (**Cook et al.** 2018).

Let us move forward in our understanding of the epistemology of other species without wasting time and money demonstrating experimentally what has been known for centuries. People who cope daily with any animal already have a lot of knowledge about their mental attributes. Let us begin to recognize this and move forward to learn more about human and non-human sentience and how it interweaves with all other mental attributes.

References

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