What is Knowledge, Understanding, and intelligence? - A dialogue between Massimo Pigliucci and Mark Pharoah

At last count, Massimo Pigliucci has published 113 technical papers in science and philosophy. He is also the author or editor of 10 technical and public outreach books. He is chair of the Philosophy Department at Lehman College and Professor of Philosophy at the Graduate Center of the City University of New York).

Pharoah: are you of the view that there can be intelligence in the absence of knowledge?
Pigliucci: no, because knowledge doesn’t require understanding.

Conclusion:

intelligence requires knowledge
knowledge does not require understanding
intelligence does not require understanding

Pigliucci continues: A bacterium “knows” [error - he didn’t mean know in the sense of understands] to move away from dangerous chemicals, thus showing an intelligent behavior. But there is no understanding of the dangerous nature of the chemical, nor conscious awareness of the evasive maneuver.

Conclusion:

intelligent behaviour does not require understanding or knowledge

Pharoah: You are saying a bacterium “knows” but a plant does not? That; the plant acts intelligently, but only because natural selection has programmed it... programmed it with what? And what holds the programme in the plant? What name do we call this vehicle that holds and implements “the programme”?
Pigliucci: No, nothing without self-consciousness “knows” (in the sense of understands) anything. What I said / meant was that all organisms behave “intelligently” in the sense of having non random responses to their environment... that sort of adaptive behavior was “programmed” (yes, it’s a metaphor) by natural selection.
Pharoah: what holds the programme in the plant?
Pigliucci: DNA?
Pharoah: Since you are of the view that there cannot be intelligence in the absence of knowledge
Pigliucci: I am not. I am of the view that there cannot be knowledge without understanding. Again, lions are intelligent. Plants *behave* intelligently (in the sense of being adaptive and looking purposive). (The difference being caused by the former, but not the latter, having a nervous system.

Conclusion:

Intelligence does not require knowledge ?
knowledge requires understanding
There is a difference between intelligence and behaving intelligently - Alternatively, there is such a thing as false and true intelligence

Pharoah continues: Because you say: "one can display intelligent behavior (as, say, plants do when they keep track of the sun's position with their leaves) and yet have no understanding of what's going on."
I interpret this sentence to mean the following:
"intelligent behaviour may arise in the absence of understanding - an example of this is when plants follow the sun as it traverses the sky."
Therefore, are you of the view that in the absence of understanding, plants nevertheless possess knowledge by virtue of this display of intelligence?Because, in what way can an agent demonstrate intelligent behaviour if it has no knowledge by which to form its 'acts of intelligence'? So in your view, is the notion that a plant can display intelligent behaviour equivalent, to saying it possesses, or has access to, some form of knowledge?
Pharoah: in what way can an agent demonstrate intelligent behaviour if it has no knowledge by which to form its 'acts of intelligence'? <
Pigliucci: Because it has been programmed thus by natural selection.

Conclusion:

intelligent behaviour is programmed by natural selection

Pharoah: you say "computers can behave intelligently". In my view this is equivalent to saying that

i) an indicator light on a car 'can behave intelligently' - because it can flash on and off; or even possibly

Pharoah: Since you are of the view that there cannot be intelligence in the absence of knowledge, am I right in understanding that this mean that you are of the view that in the absence of understanding, plants nevertheless possess knowledge by virtue of their display of intelligence?

No, for reasons that I hope are now a bit clearer

Conclusion:

intelligence requires knowledge

knowledge requires understanding

Pigliucci to Richard: plants don’t have nervous systems, and here on earth that’s what confers intelligence (because the organism becomes behaviorally much more flexible in response to environmental challenges). But nervous systems are the mechanisms, intelligence is the resulting phenomenon, there is a distinction between the two.

Conclusion:

intelligence requires a nervous system

In response to others:

Pigliucci: we ourselves are beings “programmed” by natural selection and capable of understanding.

Pigliucci: I think it is you who is confusing intelligence with understanding. A lion (or a plant, for that matter) can act very intelligently and yet have no understanding of what it is doing