The Woes of Scientific Realism

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Abstract

This paper investigated the disagreement between Realists and Anti-realists on the observable and unobservable distinction in scientific practice. While

the realists maintain that machines and gadgets can simulate the human act of perception there-by making all realities under the screen of science observable, the anti-realists or the instrumentalists insist that what cannot be observed with the human senses even if detected with gadgets are not observable. This paper contended against the realist position which says that machines can simulate the human activity of perception. Hence the distinction between what is observable and unobservable is shown to be indisputable.

Introduction

In metaphysics there is a long standing argument between followers of realism (the view that the physical world exists independently of human thought and perception) and the apologists of idealism (the view that the existence of the physical world is dependent on human perception) (Ozumba, 2001). Realism is further broken down to three different types: ultra or transcendental realism which Plato represents, and which holds that the real things exist in a realm other than this physical one (Copleston, 1985). Naïve or Nominal realism which Philosophers like G. E. Moore represent hold that things in this physical world are real as we perceive them. There is also scientific realism (our focal point in this discourse), which holds that the real is that which is correctly described by a scientific theory (Okasha 2002; Chalmers 1982).

But there is another controversy between the scientific realists and their opponents, the anti-realists or the instrumentalists, that controversy concerns the triumvirate: the observable, the un-observable or both with regards to scientific theory. The realists as we shall henceforth call the scientific realists, suggest that scientific theory can describe both the observable and the unobservable worlds while the instrumentalists deny the possibility of a scientific theory correctly describing the un-observable world. It is here that our argument in this paper takes shape for how can science, the opponent of metaphysics, admit of metaphysical explanation? And how can metaphysics become useful in scientific theorizing? In other words, how can the metaphysical form a foundation for the scientific? We are not interested in the pragmatics of such theories nor in whatever claims the realist may make in defence of their position but in the empirical-transcendental harmony inside the realist world of the observable and the unobservable.

In his paper, "Computing Machinery and Intelligence", Tuning (1950) had made a bogus claim that one day machines might be able to outwit men. Can it be taken in this respect, that the realist position that the so-called unobservable in the scientific theories are actually observable because scientific equipment can detect them? Does it now mean that the Turing's claim some six decades ago is now a reality? He said,

> Our superiority can be only felt on such an occasion in relation to the one machine over which we scored our petty triumph. There would be no question of triumphing simultaneously over *all machines*. In short, then, there might be men cleverer than any given machine, but then again might be other machines cleverer again and so on (p. 445).

Do we then conclude that the time for machine superiority over men has arrived? And by so doing justify the realist claim and set aside for good all objections to the possibility of machine observation of the physical realities to which human organs have proven ineffective or complete failure as assumed. A very good back-up perhaps, to this realist ascendency is the chess game experiment of May 1997 between Garry Kasparov, the best (human) chess player ever known in a six-game match with Deep Blue, a chess program running on an IBM super computer capable of massive parallel-processing – dividing up a larger problem into smaller problems and working on a number of the smaller problems simultaneously (Furman and Avila, 2000). Deep Blue was said to have won the match with two wins, one loss and three draws. The significance of this machine triumph to the realist position is that where human ability elapses should not be construed as the standard, that is to say that scientific machines, in our context (microscopes, binoculars, particle detectors etc.,) can do even better. But how true is this supposition? Does what the scientific equipment do qualify as observation or better put, perception? Is there any difference between scientific detection and sensual perception? If there is, are there other things which men can do, that machines cannot, as a justification of this difference?

What men can do which machines cannot do

Artificial Intelligence has to do with the study of the possibility of machines possessing intelligence and judgment. So far, machines have been built with the capability of solving mathematical problems, play chess, sort mail, guide missiles, assemble auto engines, and diagnose illnesses, read books and

converse with people even. This is, according to Lycan (2000), what we might call intelligent behaviour. But if machines now share with humans, the quality of being intelligent, does that in every shade make them capable of doing everything a human can? Or are there other things, which contribute to the uniqueness of humans that machines cannot do? It is important we make this digression from philosophy of science to Artificial Intelligence so that we might reach a platform upon which to effectively trace the sameness or differences between humans and androids; not in terms of looks but behaviour.

In May 1997 as we earlier stated, an IBM super computer called Deep Blue (capable of massive parallel-processing-dividing up a larger problem into smaller problems and working on a number of the smaller problems simultaneously) defeated the Grand Master Gary Kasparov, the best (human) chess player the world has ever known. This feat confirmed to a large extent that there could be machines that would outwit humans. Turing had proposed a test – the Turing test as it has come to be known – for determining whether a given machine is intelligent (Turing, 1950). But the question may yet shift a little from whether machines can be intelligent to how intelligent they can be? For all the Turing test experiments conducted so far, have shown, if little, that such super machines are virtually too intelligent by half. A good example is ELIZA, a computer program written in 1996 by Professor Joseph Weizenbaum, in Massachusetts Institute of Technology (M.I.T). Following a simple set of instructions, ELIZA constructs *intelligent* responses to patient input to mimic the role of a Rogerian Psychotherapist. Although initially impressive, further interaction between ELIZA and the patient would eventually reveal that the therapist is a Fraud (Furman and Avila, 2000). Yet another of these experiments was the one involving Parry, a computer program created in 1971 by Kenneth Colby, a psychiatrist at Stanford University, Parry was programmed to respond to questions in the manner of a Schizophrenic with a paranoid fixation that he is a mafia target. Colby set up a test in which Parry was interviewed alongside a number of genuine paranoid patients and the results were then assessed by a panel of psychiatrists. No one on the panel guessed that Parry was not a real patient (Dupre, 2007).

However, the question to be asked here is: Did Parry pass the test? The answer is not affirmative because for the test to pass for a proper Turing test,

the panel should have been told that one of the patients was a computer and the task was to identify which, in which case Parry would have very easily revealed itself when questioned more broadly.

But even if any machines were to pass the Turing test, in the past or future time, the Turing test itself has long been shown to be defective. In 1980, the U. S. Philosopher, John Searle created a thought experiment called The Chinese Room. In it, he proved that producing appropriate outputs, according to rules provided by a program is precisely what a digital computer does.

A computer program, however sophisticated, is no more than, and could never be more than, a mindless manipulator of symbols –it can have no understanding of meaning, or semantics. Just as there is no understanding within the Chinese Room so there is none in a computer program: no understanding, no intelligence, no mind and never more than a simulation of these things (Searle, 2000; Dupre, 2007).

Thomas Nagel has wielded a decisive opinion that attempts to understand the mind by analogy with man-made computers is a mere waste of time. A strong argument that machines cannot behave like humans is weaved around *consciousness*. Following a functionalist point of view, one of the supporters of computer intelligence, Lycan (2000), raises interesting questions: if a computer responded to injury in the appropriate way, would such android have the mental state 'being in pain'? If so, would the android be conscious? His answer is "yes, it would be conscious". All of the reasons one has for believing that other people are conscious turns out to be reasons that one could have for believing that a machine is conscious (Lycan, 97-102). But Functionalism (like behaviourism) is a software solution to the theory of mind in computer terms. It defines mental phenomena in terms of inputs and outputs, with no consideration of the hardware platform (dualist, physicalist, whatever) on which the software is running. The problem, of course, is that focusing on inputs and outputs threatens to lead us straight back into the Chinese Room. In which case, functionalism meets the same dead end as behaviourism. Looking at machines from the outside (as Turing and Lycan suggest) an android, appears to be conscious of its environment. But is it? Is it conscious in the same way as humans are? Morton Hunt argues that one basic difference between human and machine consciousness is that humans are conscious of being conscious (103-107). Hunt quotes Donald Norman as follows:

> We don't have any program today that are self-aware or that even begin to approach consciousness such as human beings have. I see this as a critical difference between human intelligence and artificial intelligence. The human mind is aware of itself as an identity, it can introspect, it can examine its own ideas and react to them- not just with thoughts about them but with emotions. We can't begin to simulate consciousness on a computer and perhaps never will (103-104).

Hunt therefore, makes it clear that even if machines can be conscious (which they cannot), they would still not be aware of their consciousness.

Searle agrees with Hunt that there are things which humans can do which computers cannot. Turing and Lycan have suggested that androids are capable of being intelligent – and probably even having mental states. But does intelligence imply consciousness and comprehension? The answer is obviously no! Searle proves it with his ingenious thought experiment – The Chinese Room. In it, Searle imagines himself- an English speaker not knowing a word of Chinese – confined within a room into which batches of Chinese scripts are posted. He is already equipped with a pile of Chinese symbols and copious rule book, in English, which explains how he is to post out certain combinations of symbols in response to strings of symbols in the batches posted to him. In time, he gets so adept at his task that, from the point of view of someone outside the room, his responses are indistinguishable from those of a native Chinese speaker. In other words the inputs and outputs into and out of the room are exactly as they would be if he had a full understanding of Chinese. Yet all he is doing is manipulating uninterpreted formal symbols; he understands nothing (Searle, 109-114; Dupre, 38). It is this John Searle's ingenious creation that has so far silenced the pro Turing's and defied all known arguments in favour of machines behaving as well as humans.

Also, in consideration of the target in this paper, the researchers shall discuss further things that humans can do which machines cannot. Humans can show emotion, they are dexterous or display skills and are teachable. If an android is programmed to sort mails, mails it will sort. Firstly, it will neither be interested or uninterested, happy or sad about the job. Secondly if it is removed from the office and taken to a farm, it will not be able to display any other skill besides sorting mails. Thirdly, if a certain farmer were humane

enough to teach the android a few emergency farm skills, it would not be able to learn. Whereas in these three cases that the android failed, any human, citrus paribus, will succeed. Humans can get excited, angry, they can be happy or sad, they can feel all sorts of emotions, they can learn from the scratch, they can even get interested or uninterested over something; androids do not share these experiences, on the other hand. They execute whatever task they have been programmed to execute without further consideration. They have neither intuition nor consideration instinct. In other words, they do not know what is right or wrong, what is pitiable, what is partial and what is abominable nor do they know what forgiveness is or what no forgiveness is. In short, they do not have any knowledge, only programs. If an android were to become manager in a company which has employee rule: "any staff who comes to work late will be fired". And one day, his secretary (a human) comes to work two seconds late because her only child had died that morning, such an android will fire his secretary but there are no sensible humans in the world who would apply that rule in the said circumstance – reason being the presence of consideration instincts in them, which machines lack.

Humans have nerves, blood, neurons connected to their brains, which is why they could feel, learn, know, understand and even perceive. Machines on the other hand, have cables, circuits, sensors which explain why where humans perceive for example, they can but detect. In the following section, we shall trace the line of distinction between sensual perception and electronic detection.

Detection or perception: the woes of scientific realism

When for example, a android is built by scientists programmed to produce results over what lay beyond man's observatory powers, such a super machine has to be equipped for this task. Because they truly wished it (here, we shall refer to the robot as Bruce) to be like human in every inch, they had to fit Bruce with body parts equivalent to those of humans. As a result they fitted him with prothetic body parts, synthetic arteries, neural fibres, carbonized sensors etc. They wanted Bruce to behave, feel and gather knowledge of the intangible automatic corpuscles in every inch as a human would. And then the time to let Bruce enter his new natural environment came, Bruce walks a few dozen meters around a designated field before returning to the laboratory with results. When his memory was analyzed, it

was discovered Bruce had *noticed* the presence of observable things as trees, plants, insects etc., also, he *noticed* in addition, the presence of other things like micro-organisms, protons, neutrons, electrons, the quarks etc. The inevitable question that lays bare is: How do we interpret the word *notice* in Bruce's experience, perception or detection?

The main point in the debate between realism and instrumentalism is the distinction between things that are observable and things that are not. Okasha (2002) makes a case that "so far we have simply taken this distinction for granted – tables and chairs are observable, atoms and electrons are not. But in fact the distinction is quite philosophically problematic" (p. 66). For the instrumentalists, it is imperative that the distinction is maintained if they were to win the debate that certain things are unobservable. And for the realists, it is as important that the distinction is eliminated if they must win the argument that everything is observable.

When the realists close the door against the observable/unobservable dichotomy, they open by default yet another door leading to other problems. One of such problems has to do with the relation between observation/perception and detection. Things like the subatomic particles are obviously not observable in the ordinary sense, but scientists have long established that their presence could be detected by some gadgets like particle detectors. One such particle detector is the cloud chamber, a closed container filled with air that has been saturated with water-vapour. When charged, particles like electron pass through the chamber, they collide with neutral atoms in the air, converting them into ions; water vapour condenses around these ions causing liquid droplets to form, which can be seen with naked eyes. We can follow the part of an electron through the cloud chambers by watching the tracks of these liquid droplets.

Realists claim that this makes electrons observable to human senses. But does it? The answer is safer "no" than "yes". The cloud chambers merely helps us to detect the presence of electrons not observe them. The liquid droplets are just tracks not electrons themselves, so watching them does not mean we are watching electrons. It is like watching the smoke trail of a high speed space rocket; this does not mean observing the rocket itself.

Maxwell, a staunch realist has argued that observing with eyes and detecting with instruments all lie on a smooth continuum (Maxwell cited in

Okasha2002, p.67). For him there is no difference, if not, how do we know the dividing line? If something can only be seen with the help of sophisticated scientific instruments, does it count as observable or detectable? How sophisticated can the instrumentation be, before we have a case of detecting rather than observing? This argument is not decisive.

Fraassen (cited in Okasha, 2002), a contemporary instrumentalist describes Maxwell's argument as simply making the word "observable" vague and insists that even as at that, the dividing line would still exist.

In this paper, we have chosen to substitute the word "observation" for "perception", which is a broader term than observation, for it encompasses the five senses required in empirical pursuit of knowledge. The reason for this is twofold: in the event of the word observation being limited to accommodate what the realists' claim the scientists do with the corpuscles, the word "perception", broader as it is, will suffice. And where the word "perception" could not suffice, it would at least give us a clear vision that there is a boundary between observable and unobservable. Anyone who has done this analysis well will face the very obvious, that whatever cannot be perceived without the help of instrumentation(s) is at least not observable. We do not say here that such unobservable things do not exist nor do we speak otherwise, what we posit is that if they cannot be perceived (philosophically speaking), then the issue falls within the arm bit of our "safer no than yes" explanation. What this means in philosophy is that Corpuscles are mere imaginations or at least, metaphysical realities, but empirically speaking, they cannot be said to be real.

The scientists' claim of detecting these corpuscles, we have not and do not intend to doubt but that these *detectable* particles are, or at least are synonymous with physical, empirical realities, we make bold to reject, for wherein they are not perceivable, they are incorporeal or unintelligible or both.

The most stunning of this revelation is that the key question has an obvious answer: it is not whether the electronic gadgets can perceive like the human organs but rather how well can they imitate the human act of perception? This follows the obvious fact that these machines cannot perceive. They do not have nerve endings and neurons connected to a brain like humans; they only have cables and circuits which do not pass for sense organs.

Thus, we are here confronted with the question: what does observable objects consist of? To this Locke (2000) replies, "sensation convinces us, that there are solid extended substances" (p. 225). And Descartes (2000) adds, "Thus extension in length, breadth and depth, constitutes the nature of corporeal substances" (p.218). What this means is that for anything to be observable or perceptible, it must therefore be physical, material or corporeal, "for the existence of an idea" according to Berkeley (1982), "consists in being perceived" (p. 227). Although Berkeley speaks of the ideas in the mind, he nevertheless refers to the physical objects without which perception could not take place.

By insisting that there is no divide between what is observable and what is not, the realists declare unequivocally, that everything described by scientific theories is observable. But atom and its sub-particles are not observable and by this is meant not perceivable. How then can a scientific theory describe something without the sensation of that thing? It is not clear to us how one might perceive something which has no extension. Berkeley (1982) echoes this view that it is impossible to perceive anything without recourse to its material form. This shows that sensual perception has to do with material things. It is an empirical tool which involves the use of the human five senses to obtain knowledge of the world or the extended objects. "And this extended object", in the contention of Descartes (2000) "is called by us either body or matter" (p. 218). The Marxist dialectics has described the world better than the Hegelian version of it because matter stood at the center of Marxist world (Mukhi, 2008). While for Hegel it is the absolute or idea or mind or spirit (Durant, 1961). And there was no way we could perceive the absolute spirit, herein likened to the intangible atom and its sub-particles. Berkeley (1982) has bemoaned, that the existence of things without the relation of their being perceived is unintelligible. And Hume (1993) suggests that everything we know about existents arises entirely from experience. What we draw here is that atom and its sub-particles which are not amenable to human senses are unintelligible to the empiricist philosopher. And that would be metaphysics- and it would make a realist a metaphysician. Ayer (2001) has written:

> One way of attacking a metaphysician who claimed to have knowledge of a reality which transcended the phenomenal world would to enquire from what premises his propositions were deduced. Must he not begin, as other men do, with the evidences of his senses?

> And if so, what valid process of reasoning can possibly lead him to the conception of transcendental reality? (p. 160)

And this type of position opposed to metaphysics was also the goal of the Logical Positivists. It means that anything that cannot be perceived using human senses should not be classified as a physical reality

When the realist claims that the aid of instrumentation enables the scientist to observe (perceive) those aspects of reality beyond the sensual powers of humans, we wonder aloud, if this exercise be called perception, whose is it: That of the scientist or the instrument? Yet, again as much as we disagree that the exercise belongs to the scientist, we also reject that it qualifies as perception in the first place. We may flatly tag the machine exercise "detection", a kind of *sensorous* or machine experience which is neither sensual nor conscious. So there is a line between perception and detection. The first is a human experience the latter is a machine experience. But there is no sense in, and there is no way the machine experience could become a human experience. Also, in-as-much-as whatever the machines do could be described figuratively, as "experience", it can never be called perception, for the machine does not possess sense organs.

Therefore, all the scientific theories that describes the sections of the intangible world, which the realist insists make a correct description of the world are here shown to be false theories. Ayer (2001) supports this position in the following line:

> For we shall maintain that no statement which refers to a "reality" transcending the limits of all possible sense-experience can possibly have any literal significance; from which it must follow that the labour of those who have striven to describe such a reality have all been devoted to the production of nonsense (p. 160).

Conclusion

What we have done here is not prioritizing sense experience over the other sources of knowledge; this would be far from the point of this paper. We have rather shown that, however the realist might dispute it, the distinction between observable and unobservable still exists and that what the instrumentations do is not perception but detection. Also, we have not denied the peculiar weaknesses associated with perception as a source of knowledge;

that too was not the goal of this paper. The point is, no matter how limited the empiricist picture of human knowledge might be, it at least, could not be accused of being fanciful. Plato's world of ideas could not be pointed to, or demonstrated (just like atom and its sub-particles), in the ordinary world affairs. But the very objects of the empiricist's perception were the actual features of everyone's experience (Popkin and Stroll, 1981). In other words, the empiricist philosopher is sure that, latent in the scientific theories are things which are observable and those that are not, and that the machine experience can never be compared to that of humans.

Thus the one question left for the realists now is not whether the observable/unobservable distinction can be shown not to exist or whether the so-called unobservable by the aid of super-scientific instrumentation can be made observable, for the possibility of these have become very remote, but rather, how else could scientific realism be rescued? We leave them to bother on that!

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