## Hegel and Feynman :: a dialogue

What follows is my attempt to reproduce some of the arguments Hegel presents in A.I and A.II of his *Phenomenology of Spirit* that I have certain objections to, but in dialogue with a physicist of the modern era (let him be Richard Feynman). I have taken care to denote this dialogue as an ‘attempt,’ for I find Hegel’s writing quite difficult to follow – forgive me if I have misrepresented Hegel. Here, Hegel (H) and Feynman (F) are catching up over a few drinks at the h-bar, but are interrupted by a rather strange occurrence.

H: Hey Richard! Did you see that?! Did you see what just happened to my drink? I’ve never seen such a strange sight!

F: No, sorry, there was this one really cute chick that just walked into the bar – why? Surely you shouldn’t call attention to yourself since you got into a fistfight with that idiotic Empiricist who goes by Crass.

H: Oh please, don’t remind me of that; that was a rather unpleasant experience. But wait – don’t change the subject! The ice in my glass! It simply went *through* the glass! Look, the ice is on the floor now! Surely I must be hallucinating…

F: Ah, dear Georg, I see you are not quite up to date on your knowledge of physics; that is a phenomenon we call “quantum tunneling.” Though I must say, it is truly rare to see it occur at such a macroscopic scale!

H: Hmph, you materialists and your outlandish theories. What evidence do you have anyway?

F: “What evidence have we?” you ask a scientist? Ask and ye shall receive, my friend. Speaking of evidence, what evidence do you have that the ice really did tunnel through the glass? For all I know you could be making this up! *(sarcastically)* Indeed, was it not a *here-this-now*, which you can no longer truly describe to me?

H: *(visibly annoyed)* Come now, Richard. Do you really subscribe to that sense-certainty nonsense? Have you not read my *Phenomenology*?

F: *(chuckles)* My my, I was only joking, Giorgio, old chap. I have, in fact, read it – quite an interesting read, if I may say so. *(under his breath:* Interesting in the sense that I couldn’t tell up from down.*)*  I might actually agree with the majority of your ideas on sense-certainty.

H: Yes? Please, do continue.

F: Well you criticize sense-certainty-type knowledge of this-here-now as rather useless, do you not? Simply because it is impossible to articulate, and is thus meaningless.

H: Indeed. Why should we call something knowledge if such a thing cannot be represented by language, and thus cannot be used in logical discourse? Of course, mediate knowledge is useful, i.e. I can describe this drink as “liquid,” but this adjective stems from previous experience and has associated with it much information that is independent of my drink. In this sense, it does not represent the this-here-now that is immediate knowledge.

F: Hmm, so I gathered. I think I see the root of the problem: it’s difficult to create a faithful representation of immediate experience. Inevitably, one ends up bringing in intuitive, background concepts that taint the immediate object.

H: Precisely. And that is exactly why sense-certainty is such a poor type of knowledge.

F: I must say, however, that I do not find this assertion particularly deep. All it is really saying is that language is an object with structure fundamentally distinct from that of reality.

H: In some sense, yes, but –

F: Furthermore, it is not even clear to me why this argument is useful at all. Surely no one would go as far as to claim that all our knowledge is based on pure sensory stimuli. Take, for example, logic or mathematics, with which one can make conclusions entirely contained in one’s head. The next step, then, is to claim, as my good friend Bertrand might, that sense-certainty can lead to more complex truths.

H: Bertrand Russell? Pshaw! But how can you possibly draw conclusions from ineffable… things?

F: No, no, no, you’re missing the point. One does not need to draw lasting knowledge from sense-certainty *directly*. You encounter something strange and unfamiliar and you form a mental image of it, an unfaithful representation, if you will. You then proceed to draw conclusions from it. So sense-certainty is, in some sense, the poorest knowledge, but only because it is at the bottom of the food-chain, so to speak. It is the first step of the ladder of knowledge, and perception is what takes us from the first step to those that are higher.

H: Perception? Oh, don’t even get me started on perception.

F: Yes, well you see, there’s this one little technical detail that I don’t quite agree with in your discussion about perception. It has to do with associating descriptors to an object.

H: Ah yes. For some reason, many people seem to think that an object can be thought of as nothing but the union of its constituent properties.

F: But why can’t they be?

H: Take salt, for example. Sure it can be perceived as white, pungent, cubical, etc. But salt is not the union of all of these properties, as the properties are many, but the salt is one.[[1]](#footnote-1) Somehow salt has something more than just these properties – it has also the property of being “one.”

F: Could you possibly be any more vague?

H: *(offended)* What? I am being perfectly clear! *(Mutters to himself)* Perhaps this matter is above his dull intellect.

F: *(sighs)* Oh well, never mind that. As a physicist, I would assert that salt is rather complex. It is precisely this complexity that makes it difficult to discuss its properties.

H: Complex! In what world is a grain of salt complex?

F: Ah, in the atomic age, my friend. Look here. Salt is a lattice of atoms, bonded to each other in certain ways. Let us first understand the atom.

H: *(puzzled)[[2]](#footnote-2)* I am not sure I understand 100%, but let us proceed. Surely we can’t an atom cannot be just the sum of its properties.

F: Ah, but it can! The modern theory of quantum mechanics has shown us that an atom can be described completely by a mathematical object called a “wavefunction.” *(somewhat condescendingly)* If you are anxious to know the details, I’m sure I could spare you a couple hours a week of one-on-one tutoring until you have the necessary background to proceed with this argument.

H: *(haughtily)* No, no, go on – I’ll take your word for it for now.

F: Well, as I was saying, the wavefunction completely characterizes the atom[[3]](#footnote-3); i.e. given another, distinct, atom, the two wavefunctions *must* be different!

H: Hunh.

F: Indeed. In this sense, the wavefunction is the descriptor for the atom. But if every atom has a distinct wavefunction, then talking about wavefunctions is the same, or as mathematicians like to say, isomorphic to talking about the atom itself!

H: Hmm… I’m not sure I follow.

F: Let me put it a bit simpler. Take the number 2.

H: Two. Got it.

F: It is easy to show that 2 is the only even prime number[[4]](#footnote-4).

H: Yes, of course – that makes sense.

F: Now suppose we have the set of adjectives {“even”, “prime”}. If we work in the universe of integers, it is clear that talking about the set numbers that have this set of property is completely equivalent to talking about the number 2.

H: Ah I see. But how does this example connect back to our discussion about salt?

F: Well since atoms can be uniquely marked by their wavefunctions (and since an atom is *completely* represented by a wavefunction, as far as physicists know), by the logic similar to that in the case of numbers, we may as well talk about wavefunctions, and not atoms. Furthermore, it should be believable that a grain of salt can be uniquely characterized by the composite wavefunction of all the atoms in the grain.

H: *(thinks for a few seconds)* Hmm… I don’t immediately see a flaw in your reasoning.

F: *(looks amused)* Are you sure you don’t want to take up my tutoring offer?

1. This argument is based off of paragraphs 4-6 in II. Perception. This part is very obscure and hard to interpret – I have done my best. [↑](#footnote-ref-1)
2. To be fair, Feynman *did* come a whole century after Hegel. [↑](#footnote-ref-2)
3. This is, in fact, only true for fermions: two fermions (electrons, some atoms, etc.) cannot be in the same quantum state. Bosons (photons, Rb-87, etc.), on the other hand, can be in the same quantum state, and thus are a little trickier to deal with. [↑](#footnote-ref-3)
4. Pf: Suppose *x* is an even prime. By definition, a number is prime if it is divisible by 1 and itself. But since *x* is even, it must be divisible by 2. If *x* is not two, it is divisible by (at least) 1, 2, *x*, and hence, is not prime. This is a contradiction. Consequently, *x* must be 2. [↑](#footnote-ref-4)