Billiard Balls and Burning Cotton

An Examination of the Underpinnings of the Universe as Discussed by Averroes, Ghazali, and Hume

INTRODUCTION

When two billiard balls collide, one stops and the other goes rolling across the table. Physicists can explain, all the way down to the atomic level, why this is so. Any ordinary person can tell you that the first billiard ball *caused* the second billiard ball to move. This idea of necessary causation is rooted in the deepest layers of our understanding. We employ it in everything from science to our very conception of our selves as we move, apparently under our own volition, through the world. But is any of this true? Are the billiard balls really connected?

Averroes, or Ibn Rushd, an ancient Islamic philosopher, would say yes. Ghazali, another Islamic philosopher who preceded Averroes, would say no, and that the motion of the billiard balls is caused *directly* by God. David Hume would say no and leave it at that. These three positions – traditional, occasionalist, and skeptical – each have their values and their flaws. This paper will expound upon these, as well as the reasoning behind each philosopher’s theory. In the end, an overall evaluation shall be attempted, although the chances of any actual answers being reached are slim. Such is the case in most of philosophy.

SKEPTICISM: HUME

Let us begin with Humian skepticism. Hume is famous as a radical empiricist, breaking down our traditional notions of what we really know. In the seventh chapter of *An Enquiry Concerning Human Understanding*, appropriately titled *Of the Idea of Necessary Connexion*, Hume outlines a rather persuasive argument as to why and how we don’t, in actuality, know of any logical connection between events – a skeptical argument, opposing the views of traditional “causationalists” like Averroes.

He begins with a groundwork of basic empiricism – that is, the idea that we only know that which we perceive. We can only have ideas that are based upon our prior experiences. We can imagine oranges and marshmallows because we have seen them before; we can imagine unicorns because they are combinations of things we have previously perceived.

*It seems a proposition, which will not admit of much dispute, that all our ideas are nothing but copies of our impressions, or, in other words, that it is impossible for us to think of any thing, which we have not antecedently felt, either by our external or internal senses.* (Hume VII.49)

To many modern people this may seem like a given, but it is an important groundwork to have in place. For example, a theologian might argue that we can have knowledge given to us by God. Here Hume is implicitly rejecting that and all other alternative systems of epistemology.

Hume’s argument from this groundwork is simple. In essence he says “Show me the causation.” He gives many examples of cause and effect pairs that are taken for granted in everyday life, and in each instance shows that we can’t actually perceive any connection between the events. Rather, all that we can actually perceive is a sequence of events – as Hume distinguishes, a *conjunction*, not a *connection*.

*When we look about us towards external objects, and consider the operation of causes, we are never able, in a single instance, to discover any power or necessary connexion; any quality, which binds the effect to the cause, and renders the one an infallible consequence of the other. We only find, that the one does actually, in fact, follow the other.* (Hume VII.50)

When two billiard balls collide, all that we really see is one ball move and then stop moving, and another ball begin to move. Nowhere can we point to any sensory evidence of some sort of “power” (as Hume says) of causation. It’s as if all of life is a movie – when we see someone punched on television, we don’t say that the pixels of the hand hit the pixels of the face and *caused* them to move; rather, it is simply distinct images, each playing out their particular role – for reasons we do not fully understand.

Continuing in a rhetorical search for the root of our notion of causation, Hume considers our internal experiences. Perhaps, he says, our idea of causation comes not from outside but from within. He examines the way in which we can will our bodies to move and they obey – could this be an instance of real causation? But no, says Hume, it is not. The connection between body and soul (or mind, if you prefer) is, if anything, *more* mysterious than the “necessary connexion” in question.

*…is there any principle in all nature more mysterious than the union of soul with body…* (Hume VII.52)

Moreover, we have different levels of control over different bodily parts and functions, as well as different levels of control at different times of life and conditions of health.

*We are not able to move all the organs of the body with a like authority…* (Hume VII.52)

Even more tellingly, the effect of our will to move does not appear to be the movement itself, but rather a mysterious event in our nervous systems that sets of yet more mysterious events, only eventually resulting in the actual movement.

*We learn from anatomy, that the immediate object of power in voluntary motion, is not the member itself which is moved, but certain muscles, and nerves, and animal spirits… ere it reach the member itself whose motion is the immediate object of volition… Here the mind wills a certain event: Immediately another event, unknown to ourselves, and totally different from the one intended, is produced: This event produces another, equally unknown: Till at last, through a long succession, the desired event is produced.* (Hume VII.52)

All of this suggests that physical volition is not a valid source of our idea of causation.

Then perhaps, says Hume, we must look even deeper into our minds. We seem to have the ability to control our thoughts, to call up ideas and images at will and examine them in our minds, to replay memories, and a variety of other mental activities. Could this type of control be the source of our idea of causation?

*Shall we then assert, that we are conscious of a power or energy in our own minds, when, by an act or command of our will, we raise up a new idea, fix the mind to the contemplation of it, turn it on all sides, and at last dismiss it for some other idea, when we think that we have surveyed it with sufficient accuracy?* (Hume VII.53)

Again, Hume says no. To understand a connection in this case, we would need to understand the nature of the cause and the effect.

*It must be allowed, that, when we know a power, we know that very circumstance in the cause, by which it is enabled to produce the effect: For these are supposed to be synonymous. We must, therefore, know both the cause and effect, and the relation between them.* (Hume VII.53)

But again, the nature of the mind and its contents is, if anything, *more* mysterious than the idea of a necessary connection. Moreover, we have differing levels of control over different aspects of our minds, and under different circumstances. Again, this all suggests that our control of our own mental faculties cannot be the source of our idea of causation.

So what are we left with? Nothing. According to Hume, our idea of causation is based upon not one wit of evidence; that is, it is an empty idea. It corresponds to nothing real. There is no necessary connection, there is no causation. We imagine these things because our minds naturally make inductive inferences when we see similar repeated events; after several times of seeing rolling objects interact, we start to understand that when one billiard ball hits another, the second one will roll away and the first will slow down or stop. But an inference is all it is; there is nothing more than a probability that these events will always happen in the same way, whereas most people think of it as a necessary relationship.

SKEPTICISM: GHAZALI

Ghazali’s position is comprised of two parts: skepticism and occasionalism. This section will focus on his skeptical arguments – those which only undermine traditional causation theory, without attempting to create a theory to replace it. His occasionalist position will be covered later. Ghazali was a theologian, and so it is at times impossible to separate his arguments from his belief in God. While this is important to keep in mind, let us extend the principle of charity and consider his points as they stand, for they are valuable outside of their connection to divinity. This particular weakness of Ghazali’s arguments will be discussed later as well.

Ghazali’s first point is a negation of the logical connection between events. Hume operated from an empirical standpoint, while Ghazali starts with a more *a priori* method. That is, he asks us to think about so-called cause-effect pairs in purely logical terms. He then claims that

*…each of two things has its own individuality and is not the other, and neither the affirmation nor the negation, neither the existence nor the non-existence of the one is implied in the affirmation, negation, existence, and non-existence of the other…* (Ghazali 1)

This is the conclusion reached by both Hume and Ghazali, and the rest of Ghazali’s arguments are in support of this first claim. His methods continue to focus more on deduction and logic than on observation and epistemology, however. It is possible that this is, in part, because his overall position is not skeptical but occasionalist – that is, he is not just trying to undermine our over-confident ideas of what we know about causation (as is Hume); he is not merely agnostic – rather, Ghazali is positively *denying* traditional ideas of causation, in order to supplant them. In any case, he is far less the empiricist and more the logician and theologian.

Ghazali goes on to analyze a hypothetical situation in order to further elucidate his argument. Imagine, he says, a piece of cotton lit on fire and burning down to ashes. The philosophers would claim that the fire is a natural agent, not a voluntary agent. (A natural agent is an agent which cannot choose its act, such as gravity, which mindlessly pulls mass together. A voluntary agent is the opposite, an agent which can choose, such as humans or, for Ghazali at least, God.) Thus the fire *must* burn the cotton; it is in its nature.

*…our opponent claims that the agent of the burning is the fire exclusively; this is a natural, not a voluntary agent, and cannot abstain from what is in its nature when it is brought into contact with a receptive substratum.* (Ghazali 1)

But, says Ghazali, how do we know the fire is an agent at all? Fire is “dead body” – there is no proof that it has agency.

*For fire is a dead body which has no action, and what is the proof that it is the agent?* (Ghazali 2)

Here Ghazali seems to be questioning the very idea of a natural agent. He seems to suggest that non-sentient objects, such as fire, cannot have agency. Perhaps this is rooted in a deeper notion that anything without choice is not really an “agent” so much as a pawn to the forces of nature (or for Ghazali, the will of God). However, more in depth consideration of this matter is impossible given the length of Ghazali’s discussion of it here, and so will be left for another time.

Ghazali’s next point is also the essential idea of Hume’s argument:

*Indeed, the philosophers have no other proof than the observation of the occurrence of the burning, when there is contact with fire, but observation proves only a simultaneity, not a causation…* (Ghazali 2)

Once again there is this idea that we cannot *see* (or otherwise sense) causation itself. The only thing we actually perceive is a “simultaneity,” and as both Ghazali and Hume point out, even when this observed simultaneity is repeated many times, it does not prove a causation or necessary connection between the two events.

SOLUTIONS: AVERROES AND TRADITIONAL CAUSATION THEORY

This skeptical position leaves us rather lost. It is a purely negative position, in that it does not build up an explanation, but only tears others down. How are we to explain the universe without our traditional ideas of cause and effect? Clearly in most cases which we have so far observed, billiard balls and burning cotton behave just as you would expect them to. If this is not because of some necessary, logical relation between the two events or objects interacting, then why? What mechanism drives the clockwork of the world? One method to solve this skeptical problem is to defend traditional causation theory. This is the path that Averroes takes. He gives many arguments in defense of his theory, which shall now be enumerated.

Averroes first makes a plea to our common sense. He asks us to consider how reasonable it really is to deny something that is so patently obvious to everyone – the idea of causation is at the core of our understanding of the world, and seems to be almost self-evident.

*…he who defends this doctrine [of denying causation] either denies with his tongue what is present in his mind or is carried away by a sophistical doubt which occurs to him concerning this question.* (Averroes 3)

This argument is eminently tempting. It is true that for most normal people, our standard notion of causation seems beyond question – of course if one lights cotton on fire it will burn, and of course the fire will be the cause of the burning. But despite this it is well to remember that our role as philosophers is to reach beyond “common sense” and seek out the truth. However much we might like to throw up our hands and say “This is ridiculous! Of course there is a necessary connection between events! Even a five year old can see it!”, this would not be proper philosophy. The case might be different if Averroes gave us any good reason to believe that causation was truly ­*self-evident* in the philosophical sense, but he does not do so.

Next Averroes asserts that:

*…he who denies [necessary causation] can no longer acknowledge that every act must have an agent.* (Averroes 3)

If all events are truly unconnected, then it would seem that they must either have no causes, or have causes that are outside the set of observable events. Here Averroes seems to be appealing to the skeptical problem mentioned earlier in this paper – if the first billiard ball didn’t cause the motion of the second billiard ball, then what did? And if the second billiard ball started rolling on its own, what does that mean for our notions of order in the world? Can things just happen at random, with no explanation or reason? Such are the questions that may be hidden in this single sentence left to us by Averroes.

Averroes also chides skeptics (Ghazali in particular, of course) for doubting the obvious truth of necessary causation (remember his first point) because of events that have no explanation or known cause.

*And if the theologians had doubts about the efficient causes which are perceived to cause each other, because there are also effects whose cause is not perceived, this is illogical.* *Those things whose causes are not perceived are still unknown and must be investigated, precisely because their causes are not perceived…* (Averroes 3)

He seems to be arguing that just because we don’t *know* the cause of an event does not entail that the event lacks a cause. It is silly, he says, to throw up our hands and say that necessary causation must be an illusion, simply because we lack an explanation for certain phenomena. This is a fair point, but it seems to miss the heart of the skeptical argument.

Averroes’ next argument is more subtle and altogether more powerful. Our world, he says, is separated into different objects – billiard balls, cotton, flames, etc. Each of these has an essence, a nature, a set of attributes or properties that define *what that thing is*. Moreover, these essences define how these things interact with one another. Fire burns cotton because it is in the nature of fire to burn flammable things, and it is in the nature of cotton to be susceptible to being set aflame. How then, asks Averroes, can we maintain these delineations, these distinct objects, if we deny the “realness” of their interactions? If we negate the necessity of fire burning cotton when they are brought into proximity, how can we maintain that fire and cotton each have an essence? If cotton is not necessarily flammable, or if fire does not necessarily burn, then it seems that their essences are being denied, and that all of the universe may just as well be one homogeneous lump.

*For it is self-evident that things have essences and attributes which determine the special functions of each thing and through which the essences and names of things are differentiated. If a thing had not its specific nature, it would not have a special name nor a definition, and all things would be one-indeed…* (Averroes 4)

He even goes so far as to claim that it would be *less* than one, that to negate necessary causation eventually leads to the negation of being itself. However, the argument for this is both impenetrable and, fortunately, superfluous to this particular point.

Next Averroes addresses Ghazali’s denial of the agency of “dead bodies.” He acknowledges that fire may not burn a normally flammable object in every case.

*Therefore it is not absolutely certain that fire acts when it is brought near a sensitive body, for surely it is not improbable that there should be something which stands in such a relation to the sensitive thing as to hinder the action of the fire, as is asserted of talc and other things. But one need not therefore deny fire its burning power so long as fire keeps its name and definition.* (Averroes 4)

However, he says, this is because of some obstructing circumstance that may not be obvious. For example, if the cotton is wet, it may not burn; he uses the example of talc above. This does not necessarily entail the denial of fire’s agency as a burning thing. Essentially Averroes is appealing to the complexity of the natural world, and chastising Ghazali for ignoring this complexity by giving more significance than is due to events that initially appear outside of the normal natural order.

Averroes’ next argument is similar to the one before last concerning the definitions of distinct objects. He argues now that to deny necessary causation is to deny the intellect itself.

*Now intelligence is nothing but the perception of things with their causes… and he who denies causes must deny the intellect… Denial of cause implies the denial of knowledge, and denial of knowledge implies that nothing in this world can be really known, and that what is supposed to be known is nothing but opinion, that neither proof nor definition exist, and that the essential attributes which compose definitions are void.* (Averroes 5)

Here we see again the Aristotelian conception of causation which connects causation to definition and nature. This seems to be what Averroes suggests by saying that all knowledge is knowledge of causes. On this view, our knowledge of fire is what causes fire and what fire causes. This is a more plausible view than it may at first seem; for all our sensory knowledge of fire is knowledge of how fire causes light, air, and other particles to behave. On the other hand, there seems to be something left out by this definition of knowledge, for the knowledge of causes is purely conceptual, and yet we do appear to have pure sensory knowledge, for example the feeling of being burned, or the warmth of a campfire. Nevertheless, if we accept this Aristotelian view of knowledge, then the absurdity which Averroes says proceeds from the denial of necessary causation seems to be valid.

The next argument involves the idea of habitual knowledge, that is, what skeptics like Hume and Ghazali *claim* that our notion of causation is. They believe that we see events repeated in similar sequences many multiple times, and come to believe that there is a necessary connection between them through an inference that is reasonable in terms of common sense, but illogical when more closely examined.

*If they mean our habit of forming judgements about things, such a habit is nothing but an act of the soul which is determined by its nature and through which the intellect becomes intellect. The philosophers do not deny such a habit; but ‘habit’ is an ambiguous term, and if it is analysed it means only a hypothetical act… If this were true, everything would be the case only by supposition, and there would be no wisdom in the world from which it might be inferred that its agent was wise.* (Averroes 6)

This argument is frankly unclear. But Averroes *seems* to be suggesting that to say that our knowledge of necessary causation is nothing more than a “habit” reflects badly upon knowledge as a whole. This may be related to his argument that to deny causation is to deny the intellect. He may also be arguing that all knowledge about the world is formed in this habitual way, and that to delegitimize this particular instance is to delegitimize all knowledge.

SOLUTIONS: GHAZALI AND OCCASIONALISM

Another method to solve the skeptical problem is called “occasionalism,” and it is the view adopted by Ghazali. This view is founded on a belief in an omnipotent God. This is a fundamental weakness, as almost all philosophical arguments for the existence of God have been undermined to the point where they are no longer valid. However, for the sake of an interesting discussion, this flaw will be set aside for the moment, and Ghazali’s theory set out in the best light possible.

What exactly is occasionalism? It begins with skepticism towards traditional causation theory, but rather than stop here, as does Hume, the occasionalist replaces our usual ideas of necessary causation with a brand new theory.

*For the connexion in these things is based on a prior power of God to create them in a successive order, though not because this connexion is necessary in itself and cannot be disjoined-on the contrary, it is in God’s power to create satiety without eating, and death without decapitation, and to let life persist notwithstanding the decapitation, and so on with respect to all connexions.* (Ghazali 1)

Instead of one event causing another event, God causes events to happen in a successive order. It is not the fire burning the cotton, it is God. It is not the first billiard ball causing the second to roll, it is God. Returning to the movie metaphor of earlier, God is the projector, orchestrating each movement of each piece of the world. This solves the skeptical problem; but what reason is there to believe this theory?

Ghazali focuses more on reasons not to believe the traditional theory of causation than reasons to accept occasionalism as a valid replacement. Perhaps he believes occasionalism is the *only* possible replacement theory that explains the apparent order of the universe. This is a questionable claim, but once again we shall extend the principle of charity. Ghazali does have one rather compelling metaphor that he uses to describe the philosophers position. Imagine, he says, a man who has lived his whole life with a “membrane” over his eyes, so that he has never been able to see. Now suppose that he has the membrane removed one day – he will suddenly be able to see! This hypothetical fellow being, apparently, a consummate philosopher, his first thought is “What is required for sight?” Based on the evidence at hand (assuming no one has ruined the thought experiment by explaining sight to him), our hypothetical philosopher would be justified in believing that the only things required for sight are visible objects and unimpaired eyes. This is the part of the metaphor meant to align with the philosopher’s view of necessary causation – it is what they see before them, in a sense, the most obvious explanation.

But, says Ghazali, what happens when the sun goes down? Well then, our hypothetical philosopher will be plunged once again into darkness, and he will learn that *three* things are required for sight – visible objects, unimpaired eyes, *and light*. To cut straight to the point, the sun is God. The philosophers do not realize that He is the man behind the curtain orchestrating all of the supposed “causation” they observe around them, because like the freshly unblind hypothetical philosopher, they have never seen the world without the third, overarching influence – in the metaphor, the sun, and in Ghazali’s reality, God. This metaphor is clever and interesting, and serves to make Ghazali’s position quite clear and understandable. But it fails to have more than persuasive power, that is, it does not seem to be a particularly rigorous proof of any sort. Perhaps we could say that the underlying argument is that we can’t prove God *isn’t* the secret agent of all events in the world – but it would be unfair to Ghazali to foist so naïve and tenuous a viewpoint upon him.

EVALUATION

Do either of these solutions work, or does skepticism remain the only valid option left to us? First I will discard occasionalism as a valid option, primarily for the reason that God is not currently a valid concept. At this point it is a battle between traditional necessary causation theory and skepticism. On the one hand we have Averroes, and on the other we have Ghazali and Hume. Considering both their positions and their arguments, here is my overall evaluation of this major philosophical problem.

Averroes’ strongest points are centered on the importance of necessary causation to the rest of our metaphysics. One of his most interesting arguments, that to deny causation is to deny distinct definitions, is a perfect example of this. Here Averroes says that if we claim that there is no necessary causation, it destroys everything else we believe. He also claims that to do so would destroy our notion of the intellect, and suggests that it would leave us unable to ascribe agents to events. All of these are strong arguments. They also have intuitive appeal, in my view, as they fit well with our understanding of causation as an essential and central piece to the way we look at the world. We can’t do away with it without collapsing the whole system.

On the other hand, many of these points by Averroes are based specifically on an Aristotelian view of causation. Aristotle’s idea of an “essential cause” is central to Averroes’ strongest defense of traditional causation theory. An essential cause is one of the four Aristotelian causes, and it refers to the part of the causation attributed to the essence or nature of the agent. Remember from the discussion of Averroes’ arguments the idea that fire’s essence was to burn flammable objects; this is an essential cause. The acceptance of this idea of essential cause is the foundation of Averroes’ implied claim that the essence of a thing is the same as, or at least inextricably bound up in, the causal interactions of that thing.

A strong defense against Averroes points, then, would be to deny essential causes. As daunting as it might be to argue with one of the founding fathers of philosophy, this is the best counter-defense to Averroes’ defense of traditional causation. It undermines his strongest argument, as well as casting doubt upon some of his peripheral arguments. If causation is not equated with essence, then his point about denying causation entailing denial of distinct definitions is moot, as well as his point concerning the entailed denial of intellect.

It might not be so easy to deny the idea of essential causation, however. Let’s consider the idea of fire burning cotton again. If we wanted to claim that fire had a distinct definition outside of its causal interactions, we would need to find another way to define it. Might we look to its heat or capacity for light production? No, for these are nothing more than the fire causing atomic particles to move faster and causing photons to travel outward from its own particles, respectively. In fact almost every piece of evidence that we have about fire, everything that composes the definition of fire, is dependent upon its causal interactions. Now, the fact that *I* cannot find a way to refute the idea of essential cause does not mean that a way does not exist – but I think that it can be at least agreed that such a refutation is difficult.

Another counter-defense exists, however. We might argue that Averroes has given us a very good reason to believe that necessary causation is essential to our current metaphysical system. However, this does not actually prove that necessary causation exists. It merely shows that, if it doesn’t, we have serious problems. While this is makes it tempting, and perhaps practical for now, to hang on to the idea of necessary causation, it does not refute the skeptical point of view. This is why my final consider position is that we have good reason to maintain our ideas of necessary causation, but to treat them with a healthy dose of skepticism (the attitudinal rather than the philosophical variety). It is interesting also to note that the strongest skeptical arguments are based on empirical evidence. It is possible, perhaps even likely, that a real proof of causation must be constructed *a priori* or deductively, as it does not seem like something observable. In other words, this may not be a question for the metaphysics lab.

CONCLUSION

In this paper I have outlined the three competing positions of traditional causation theory, skepticism, and occasionalism. I have discussed the arguments of Averroes, Hume, and Ghazali, and attempted to evaluate each of these as far as I was able. In the end, my conclusion is that, while the skeptics are right to say that we have no proof of necessary causation, it would be unwise to abandon the concept entirely given its central nature in our system of metaphysics. As to the wider significance of this discussion, it cannot be reasonably claimed that there is any practical application for this discussion; such is the case which much of philosophy. But it is of interest to any rational person who wants to understand the world around them correctly.

Notes on Citations

*Citations of Hume are in the following format:* (Hume [Chapter].[Paragraph Number])

*Citations of Averroes and Ghazali are drawn from the First Discussion of the Second Part of* the Incoherence of the Incoherence *by Averroes, “On the Natural Sciences.” They are cited by author and by page number of a word document of that discussion copy-pasted from* muslimphilosophy.com*, set at size 16 font to increase the specificity of the citations. A copy of this word document is attached for reference.*