What Motivated Epicurus to Say that Atoms Swerve?

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1. Introduction:

The swerve is the most radical departure from Democritean philosophy that Epicurus makes. The different stance is emphasized by the fact that in their physics they are generally very similar. The most obvious account for this difference is that Epicurus saw significant problems with Democritean atomism that had to be solved. O'Keefe comments, "Since the swerve appears nowhere in Epicurus' extant writings, any suggestions about why he introduced the swerve are necessarily speculative".[1] This paper will attempt to examine Epicurus' reasons for his claim that atoms swerve.

In Lucretius' account of Epicurus' philosophy the swerve, broadly speaking, has both a cosmological and a psychological function.[2] Whilst there is some debate as to the precise role the swerve plays, this essay will firstly outline O'Keefe's interpretation of the cosmological role of the swerve. O'Keefe argues that Democritus' account of atomic motion based solely upon collisions is inadequate. He argues that Epicurus had to introduce weight to account for atomic motion and the swerve to account for collisions within this account of motion. The psychological[3] role of the swerve is even more contested. This essay shall outline Russell's account of the swerve: that it makes dialectical space within atomism for freedom in what would otherwise have been a Laplacean determined world. It will be argued that these two accounts of the roles of the swerve are the most true to the evidence, and thus the roles that Epicurus wanted the atomic swerve to play. From this it can be concluded that the lack of a full account of atomic motion, and the failure to account for free will, or responsibility for actions, within Democritus' physics motivated Epicurus to say that atoms swerve.

[1] Tim O'Keefe, 'Does Epicurus need the swerve as an Archê of Collisions?', *Phronesis* Vol. 41(1996). p. 313.
[2] A. A. Long and D.N. Sedley, *The Hellenistic Philosophers*, vol.1, (Cambridge: Cambridge University Press, 1987). p. 49, 105-6. (11H &20F) Quoting Lucretius 2.216-293.
[3] I shall use the term 'Psychological', in a way that refers to both of Russell's terms 'Psychological' and 'Mechanical', as he argues the later is merely an extension of the first.

2. Epicurus and Democritus:

There can be no doubt that Epicurus was a close follower of Democritus' philosophy.[4] So much so that Cicero in De Finibus criticizes Epicurus for merely repeating Democritus, and where innovation is made, he just distorts his philosophy.[5] What is important from this dialogue is the response by Torquatus, Cicero's Epicurean spokesman. Torquatus is principally concerned with the ethical discussion, but in a passing remark links the introduction of the swerve with other criticisms that Epicurus had of Democritus.

> "*I shall return to on another occasion, and prove to you both the notorious swerve of the atoms... as well as the full extent of the criticisms and corrections that Epicurus made to Democritus' errors*"[6]

This passage clearly shows that the Epicureans felt that Epicurus was modifying and thus preserving atomism, saving it from the errors of Democritus. Given Epicurus' "great man" reputation and the meticulous attention his followers paid to his works,[7] it seems unlikely that they would have put forward a theory that did not originate within Epicurus' teaching. Thus we can conclude that Epicurus also felt he was correcting Democritus' philosophy. This still leaves open what precisely Epicurus thought he was correcting. Lacking any personal account of his motivation, it is best to first investigate the role of the swerve in the context of his philosophy and then compare it to Democritus' theory.

3. The Cosmological Role of the Swerve:

O'Keefe points out that Epicurus positioned the swerve within his account of atomic motion, alongside weight and collisions as principles of movement. Collisions have occurred eternally according to Epicurus; there was no first collision.[8] Yet Epicurus must give an account of how these collisions occur. Epicurus' first step is to explain how there is motion in the world. All atoms are perpetually in motion,[9] and are borne along by their weight.[10] Naturally atoms "would be falling downwards like raindrops through the depths of the void".[11] Unaffected therefore, all atoms travel downwards. Epicurus thus offers an account of motion caused by weight, but it appears impossible for collisions to occur, for every atom travels with the same velocity. This is because irrespective of their particular weight, the void offers no resistance.[12]

As of yet no property of the atom, extension, solidity and now weight, can offer an explanation of the collisions. O'Keefe claims that Lucretius' account points out that the swerve is a property

[4] Daniel C. Russell, 'Epicurus and Lucretius on saving agency', Phoenix Vol. 54 (2000). p. 5.
[5] Marcus Tullius Cicero, On Moral Ends, ed. by Annas, Julia (Cambridge: Cambridge University Press, 2001). p. 9. (I.17).
[6] ibid. p. 12. (I.28).
[7] David Sedley, 'Epicurus', *Routledge Encyclopedia of Philosophy*, ed. by Edward Craig (London: Routledge, 1998). p. 351.
[8] Long and Sedley, *The Hellenistic Philosophers*. p. 46. (11A4) Quoting Epicurus, *Letter to Herodotus*, 43-4.
[9] ibid. p. 46. (11A1) Quoting Epicurus, *Letter to Herodotus*, 43-4.
[10] ibid. p. 46. (11B2) Quoting Lucretius, 2.80-124.
[11] ibid. p. 49. (11H2) Quoting Lucretius, 2.216-50. Epicurus was aware of the difficulties of 'up' and 'down' within a void, and therefore had specific meaning in mind. Exposition of this is not necessary for this essay.
[12] ibid. p. 49. (11H3) Quoting Lucretius, 2.216-50

of the atom itself, rather than an event that happens to it. Lucretius says "If they [atoms] were not accustomed to turn aside"[13], as if it is within their nature to swerve. The swerve appears to be a 'natural feature of atomic motion' that can account for why there are collisions.[14] The swerve explains how atoms resists their natural tendency to travel straight down, as explained by their weight, and travel in to the paths of other atoms. This accounts for collisions, and in turn the creation of macroscopic bodies. The swerve is an explanatory *archê*, rather than a temporal *archê*. Both weight and the swerve were introduced by Epicurus each as an explanatory *archê* for atomic motion and atomic collisions respectively.[15]

This is more likely to be the account that Epicurus had for the swerve than the two other accounts proposed for the cosmological role. The traditional view is that the swerve was a historical event required to trigger the collisions, an Epicurean equivalent of Aquinas' 'unmoved mover'. This is obviously incorrect, for as shown above Epicurus denies the need for such a trigger in his *Letter to Herodotus*. Long and Sedley try to account for this contradiction by suggesting a two stage development of Epicurus' thought. They claim that for the letter, being an early work, the idea of no first collision was sufficient, but that Epicurus later refined his theory with the use of the swerve to account for one.[16] Whilst this accounts for the apparent contradiction in the traditional view, it commits Epicurus to a change of mind that, as O'Keefe's account shows, is unnecessary.

Having shown that O'Keefe's account of the swerve is the most likely to be what Epicurus had in mind, it still remains to show what the deficiencies were in Democritus' account and thus what motivated Epicurus to say that atoms swerve. The key features of Epicurus' account of the swerve are that it is part of a two part account of atomic motion and that it is a property of the atom, in both of which the swerve functions alongside his account of weight.

Therefore, Epicurus did not find Democritus account of atomic motion adequate. The atom's property of weight was designed to account for motion as a whole in Epicurus' physics. Therefore Epicurus must have felt that Democritus could not account for atomic motion, otherwise his explanation giving the atoms the property of weight would not have been necessary. Without motion, collisions could not have occurred, for the latter relies upon the former. Therefore, within Epicurus' overall account of atomic motion, he had to explain the specific motion involved in collisions, hence the swerve. Some may argue that Epicurus' account of motion, resulting in the uniform downward travel of atoms created the problem of explaining the collisions. But as shown before, Democritus had a greater problem with collisions for he could not even explain the motion that facilitates collisions, never mind the collisions themselves.

O'Keefe offers further evidence for the idea that the lack of an account of atomic motion by Democritus motivated Epicurus to say that atoms swerve. It would appear that Epicurus was aware of Aristotle's philosophy, given his definition of 'up' and 'down' within infinite space, after Aristotle asserted that the normal use of the words made no sense. Furthermore, as a follower of Democritus in Athens shortly after Aristotle, it would seem likely that he was aware

[13] O'Keefe, 'Does Epicurus need the swerve as an Archê of Collisions?'. p. 315. Quoting Lucretius 2. 216-224.
[14] ibid. p. 314.
[15] ibid. p. 317.
[16] Long and Sedley, *The Hellenistic Philosophers*. p. 52.

of Aristotle's criticisms of Democritus.[17] Aristotle's criticisms focussed on Democritus' inability to account for motion in his theory, for he could appeal neither to the void, which was only supposed to facilitate motion, nor to the atoms themselves for there was no property that could account for motion.[18] Without motion and collisions the Democritean principle of motion cannot occur.[19] If Epicurus was aware of Aristotle's work, which it seems that he would be, and Aristotle was critical of Democritus' account of motion, it would seem natural that Epicurus would be motivated to give an atomist's account of motion that does work; hence the properties of weight and swerve inherent in the atom, and atomic motion caused by weight and collisions due to the swerve.

We can therefore say that Epicurus felt that Democritus' account of atomic motion was incomplete, at least, and, by extension, that his account of the inherent properties of the atom was likewise incomplete. These two factors, which are closely related, are the motivation for Epicurus to say the atom swerved as part of his account of motion, in regards to its cosmological role.

4. The Psychological Role of the Swerve:

A similar procedure can be followed for the swerve's psychological role. By showing that Russell's account is what Epicurus meant for the role the swerve plays in regards to the freewill debate, we can then work back to see what motivated Epicurus to introduce the swerve.

Russell claims that Epicurus had a 'dialectical and purely negative' role for the swerve.[20] The atomist is at particular risk to what Russell calls Laplacean determinism, meaning that every event and the future can only be as it is, due to the causally related nature of the events in the world. This is because all events must be explained in terms of atoms and void, and the specific laws governing the motion of atoms. Lucretius appears to be aware of this problem. He first comments on the role of the swerve in regards to this discussion,

> "*If all motion is linked, and new motion arises out of old in a fixed order, and atoms do not by swerving make some new beginning of motion to break the decrees of fate, ... from where does this free volition exist*".[21]

Lucretius makes an important link. Laplacean determinism entails psychological determinism, for psychological events are a subordinate set of events to the set which is potentially governed by Laplacean determinism.[22] To preserve psychological freedom, that is to say freewill, and responsibility for one's actions, Epicurus has to show that Laplacean determinism does not apply to atomism. This is the swerve's role for Epicurus.[23] The atom makes an undetermined

[17] O'Keefe, 'Does Epicurus need the swerve as an Archê of Collisions?'. p. 313.
[18] ibid. p. 312.
[19] ibid. p. 316.
[20] Daniel C. Russell, 'Epicurus and Lucretius on saving agency'. p. 227.
[21] Long and Sedley, *The Hellenistic Philosophers*. p. 106-7. (20F1) Quoting Lucretius 2.251-93.
[22] Russell, 'Epicurus and Lucretius on saving agency'. p. 230. Obviously Epicurus would not have used the term 'Laplacean' rather perhaps physical determinism, however the problem is still the same. Russell uses 'Laplacean', and for the sake of clarity so shall I.
[23] Russell, 'Epicurus and Lucretius on saving agency'. p. 232.

act, and creates a new motion. This is all that the swerve need do in Epicurus' philosophy to preserve agency. It breaks the stranglehold of necessity. With Laplacean determinism shown not to apply, there is no risk to psychological determinism. The swerve therefore accounts for freewill and responsibility of action by making the dialectical space in atomism for positive arguments made by Epicurus that actually account for freewill.[24]

Russell's account is the most fitting of the various interpretations of the role of the swerve in the freewill debate. As such it should be considered what Epicurus intended. It has considerable advantages over the alternative theories. In regards to Bailey's account, where an "act of volition is neither more nor less than the swerve"[25], Russell's interpretation does not cast us into a world of randomness having escaped determinism. By equating volition to the random swerve, Bailey leaves us dependent upon a swerve to act, a swerve which may not occur[26], and such a process leaves the swerve responsible for our actions rather than ourselves.[27] Sedley's account is that the mind's volition is preserved via downward causation, the mind's emergent properties act upon matter, and that this is only possible with freedom of atomic movement, and the swerve gives the atom two or more tracks. The swerve creates this atomic freedom.[28] Sedley requires Epicurus to be not merely an atomist. This, however, is a presumption he needs for his account and, therefore, the burden of proof is upon him to show there is this dualism in Epicurus' thought. Quite simply, he fails to do this. Secondly, this is conceptually expensive, why posit dualism where it has been shown that pure atomism can still account for the freewill that Epicurus required. Furley's once in a lifetime break, isolating oneself from history via a swerve perhaps works well with the quote from Lucretius above.[29] There are two problems however with this approach. If the swerve is truly random, there is a risk that a swerve will not occur in everyone's lifetime. This poses the risk that some people are free and responsible for their acts, whilst others are not. This does not seem to be true freedom, nor does it seem to ease the concerns in life that Epicurus sort to do. Secondly this swerve saves us from one form of determinism, but surely it will reassert itself post-swerve on a different foundation. We don't escape determinism, but put it on a different footing. As can be seen, the other readings of Epicurus fail, and by elimination of the alternatives, Russell's account is taken to be what Epicurus meant when he said that atoms swerve.

The psychological role of the swerve allows for space within atomism for freewill and responsibility for actions. Therefore, the motivation for Epicurus to say that atoms swerve must have been that he believed that there was no such space for freewill in Democritus' account.[30] Russell points to Diogenes of Oenoanda as giving evidence that Epicurus held this view.[31] He states that the lack of free movement in Democritus' philosophy results in all motions being necessitated.[32] He goes onto say that Democritus failed to allow for the free movement of atoms,

[24] ibid. p. 234. Russell points us to *On Nature* book 25.
[25] Cyril Bailey, *The Greek Atomists and Epicurus*, (Oxford: Clarendon Press, 1928). p. 320
[26] Russell, 'Epicurus and Lucretius on saving agency', p. 226.
[27] ibid. p. 236.
[28] David Sedley, 'Epicurean Anti-reductionism', *Matter and Metaphysics*, ed by Jonathan Barnes and Mario Migucci. (Naples: Bibliopolis, 1988). p. 318-9.
[29] David Furley, *Two Studies in the Greek Atomists*, (Princeton: Princeton University Press, 1967). p.232.
[30] Russell , 'Epicurus and Lucretius on saving agency'. p. 232.
[31] ibid.
[32] Long and Sedley, *The Hellenistic Philosophers*. p. 106. (20G) Quoting Diogenes of Oenoanda. 32.1.14-3.14.

whereas Epicurus did, and because of that modification censure and admonition is possible. Cicero gives explicit evidence that Epicurus' motivation was what this essay concluded from analysis of the swerve's role. He says "Epicurus' reason for introducing this theory was his fear that, if the atom's motion was always the result of natural and necessary weight, we would have no freedom".[33] Cicero also states in the same passage that Democritus didn't account for freedom, not because he did not see the problem but that he preferred necessity. However, Epicurus himself claims blindness on the account of Democritus.[34] This matches the Oenoanda's account of Diogenes, saying that it was a failure on the part of Democritus rather than a deliberate move to allow determinism. So by conjunction of these passages we have proof of the motivation of Epicurus. Epicurus was motivated by what he thought was blindness of Democritus, what others saw as acceptance, in not accounting for freewill and responsibility of action, through the total subjectivity of motion to necessity. To counter the necessity in the world he said that atoms swerve to introduce indeterminism into the world, allowing for freedom.

5. Conclusion:

Having investigated the roles the swerve plays within Epicurus' philosophy it is possible to look back and see what motivated him to posit the swerve. The swerve was an essential part of Epicurus' account of atomic motion and collisions. From this it was possible to conclude that it was the lack of such a workable account of atomic motion and collision in Democritus' philosophy that motivated Epicurus to say that atoms swerve. In a similar manner it was shown that Epicurus used the swerve to allow for indeterminism within atomism, which left space for agency. It was shown that the lack of such space within Democritus' account motivated Epicurus to say that atoms swerve. This essay has shown that Torquatus was right, that Epicurus made 'corrections' to Democritus, which preserved atomism from fatal errors of Democritus.

References

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[5] O'Keefe, Tim, 1996: 'Does Epicurus Need the Swerve as an Archê of Collisions?', *Phronesis* 41.

[6] Russell, Daniel C., 2000: 'Epicurus and Lucretius on Saving Agency', *Phoenix* 54.

[33] Long and Sedley, *The Hellenistic Philosophers.* p. 105. (20E3) Quoting Cicero, On fate, 21-5.
[34] Long and Sedley, *The Hellenistic Philosophers.* p. 104. (20C14) Quoting Epicurus, On Nature, 34.26-30

[7] Sedley, David, 1988: 'Epicurean Anti-reductionism', *Matter and Metaphysics*, ed. by Jonathan Barnes and Mario Migucci. Naples, Bibliopolis.

[8] Sedley, David, 1998. 'Epicurus', *Routledge Encyclopedia of Philosophy*, ed. by Edward Craig. London, Routledge.