Greek Atomism and subatomic particles. 'Atomos' and 'Ameres'

Post by “TauPhi” of October 29, 2023 at 11:26 PM

I'm reading a rather obscure book on Epicurus by a Russian guy called Jan Powarkow. Unfortunately, to my knowledge, there's no English translation of it. I came across this footnote and I was absolutely amazed by it. I didn't realise Greek Atomism was so advanced. I heard about '**atomos**' but when I read about '**ameres**' I told to myself: no way Greeks came up with this!

Anyway, I thought this fragment is interesting enough so I leave English translation for you:

[...] A. F. Losiew writes that traditionalists in the history of philosophy do not attribute any significance to the fact that Greek Atomism fundamentally distinguishes the terms **atomos** (indivisible) and **ameres** (not consisting of parts). S. J. Lurie quotes a number of fragments to document this distinction, but it should be emphasized that the most important of them were previously quoted by H. Diels.

In a nutshell: **atomos** differ from **ameres** in that despite their indivisibility, they consist of certain parts, while **ameres** no longer consist of any parts and they themselves constitute the boundary of division, being both indivisible lines, indivisible planes, and indivisible bodies and generally indivisible units. Of course, **ameres** constitute a kind of intellectual construction, almost immaterial. In any case, they have no weight and are conceived as if within the atoms themselves. [...]

Post by “Joshua” of October 30, 2023 at 1:31 AM

A lot of it was fairly impressive for it's time. Compare, for instance, the atomism of Epicurus and Democritus with the cosmos of Aristotle's elements or essences;

Atomism	Aristotelianism

Law of Inertia	Correctly intuited that Force equals Mass times Acceleration. The atoms are in constant motion. Force is only required to accelerate or decelerate bodies, or to change their course. *Note that the swerve of the atoms is not consistent with this general principle.	Wrongly inferred that Force equals Mass times Velocity. Matter is naturally at rest; Motion ceases shortly after force is no longer applied.
Matter Falling	The speed of atomic motion is uniform.	Heavier objects fall faster than lighter ones.
Description of Matter	Of the atoms, their are an infinite number of each kind of atom, but the kinds are merely innumerable. All atoms have three properties inseparable from their nature as atoms--weight, shape, and size.	Objects are made of one of the five classical elements. Air, fire, and aether naturally rise. Earth and water fall.
Extraterrestrial bodies	Everything that exists everywhere is composed of atoms and void. There are other worlds like ours, and other living things spread across the cosmos.	The heavenly bodies are made of aether, the quintessence or fifth essence, and aether is perfect. It gives to those bodies the most perfectly rounded shape--the sphere.
Nature vs Mind	"There is no purposiveness in Nature, but in the processes of nonpurposive creation she has brought into being a purposive creature, man. For him, being capable of reason, a telos is conceivable." -Norman DeWitt	"It is manifest that the soul is also the final cause of its body. For Nature, like mind, always does whatever it does for the sake of something, which something is its end." -Aristotle, *On the Soul*

Post by “Don” of October 30, 2023 at 5:50 AM

Thank you, TauPhi!!
This part intrigued me:

> Quote from TauPhi
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> the most important of them were previously quoted by H. Diels.

This is no doubt Hermann Diels who co-wrote some papers with Usener and some of his own work. If Powarkow provided any specific citations to Diels, I'd be curious to dig those up on

Internet Archive. Unfortunately, Powarkow's book isn't digitized on Internet Archive.

Post by “TauPhi” of October 30, 2023 at 8:36 PM

Powarkow only refers to A. F. Losiew and just mentions Hermann Diels in passing without any references. The A. F. Losiew's work in question in called 'Anticznaja fiłosofija istorii' published in Moscow in 1977. The title is a transliteration from Russian and it most likely means something like 'History of Ancient Philosophy'. It's probably another obscure work not available in English. Sorry, Don.

I did some digging, however, and this passage seems to be closely linked with Epicurus' doctrine of atomic minima (the elachista theory).

Epicurus talks about it in Letter to Herodotus (paragraphs 55 to 59). In p.59 he talks specifically about minimum magnitudes devoid of parts (ta elachista kai amere). I didn't pay much attention to this in the past but the way Powarkow talks about it hit me hard. It seems to be very important addition to/deviation from Democritus' work.

Lucretius also talks about this in Book I (599–634) and Book II (481–499).

Post by “Don” of October 30, 2023 at 8:59 PM

> Quote from TauPhi
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> n p.59 he talks specifically about minimum magnitudes devoid of parts (ta elachista kai amere).

Hicks has:

τὰ ἐλάχιστα καὶ ἀμιγῆ (ta elachista kai amigē)

This might be one to check the papyri later.

Henry George Liddell, Robert Scott, A Greek-English Lexicon, ἀμι^γής

Post by “Don” of October 30, 2023 at 11:00 PM

I'm intrigued. For ease of reference:

> Quote from Diogenes Laertius 10.58
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> 58] "We must consider the minimum perceptible by sense (Τό τε ἐλάχιστον τὸ ἐν τῇ αἰσθήσει) as not corresponding to that which is capable of being traversed, i.e. is extended,89 nor again as utterly unlike it, but as having something in common with the things capable of being traversed, though it is without distinction of parts. But when from the illusion created by this common property we think we shall distinguish something in the minimum, one part on one side and another part on the other side, it must be another minimum equal to the first which catches our eye. In fact, we see these minima one after another, beginning with the first, and not as occupying the same space ; nor do we see them touch one another's parts with their parts, but we see that by virtue of their own peculiar character (i.e. as being unit indivisibles) they afford a means of measuring magnitudes : there are more of them, if the magnitude measured is greater ; fewer of them, if the magnitude measured is less.
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> [59] "We must recognize that this analogy also holds of the minimum in the atom (ἐν τῇ ἀτόμῳ ἐλάχιστον); it is only in minuteness that it differs from that which is observed by sense, but it follows the same analogy. On the analogy of things within our experience we have declared that the atom has magnitude ; and this, small as it is, we have merely reproduced on a larger scale. And further, the least and simplest (τε τὰ ἐλάχιστα καὶ ἀμιγῆ)# things must be regarded as extremities of lengths, furnishing from themselves as units the means of measuring lengths, whether greater or less, the mental vision being employed, since direct observation is impossible. For the community which exists between them and the unchangeable parts (i.e. the minimal parts of area or surface) is sufficient to justify the conclusion so far as this goes. But it is not possible that these minima of the atom should group themselves together through the possession of motion.

#Note in Hicks' English translation:

i.e. "uncompounded." But von Arnim's ἀμερῆ, "void of parts," is more suitable.