

**Jeff Derksen**  
**From Two to Another:**  
**The Anti-Matter Series**

Karl Marx and Frederick Engels are well-known as materialists, having helped define a materialist view of history, of economic, and of capitalism. And both Marx and Engels aimed to develop Marxism as a science rather than a model based on naturalizing capitalism and “man.” However, the intersection of key terms, and modes of movements of thought, from Marx and Engels in the scientific discourse around matter and anti-matter, was striking as I began research for my Leaning Out of Windows contribution. To begin with, Marx’s famous dictum (and one that has circulated even more in this period of globalization), that “capitalism annihilates space by time” is echoed in the process of annihilation in “the matter-antimatter symmetry problem.” For Marx, capitalism overcomes the problem of space (and the materiality of space) by speeding up production and making movement the goods of goods and people swifter and less costly. Hence, globalization annihilates space through this quick and cheap movement. This is also material. Let me put it this way: Amazon annihilates the space of the bookstore through its quickness in ordering online and shipping. In the matter-antimatter frame, annihilation occurs when positive and negative particles collide: “Matter and antimatter particles are always produced as a pair and, if they come in contact, annihilate one another, leaving behind pure energy.”<sup>1</sup> This contact produces pure energy, while in capitalism, it produces an energy that helps drive capitalism’s process of “creative destruction.”

With this opening generated by the overlap in terms, I began to notice what seemed to be a dialectical movement at the heart of matter-antimatter processes. In general, a model of dialectics, derived from Hegel, can be characterized as the three-step movement of a thesis, the introduction of an antithesis and the resulting synthesis. A well-worn critique of this model is that it is operated toward synthesis, or closure. It is a reduction of dialectal thinking, as George Ciccariello-Maher points out, but it shows the problem in which dialectics is “conservative and totalizing, contained within the bounds of a totality that divides cleanly and without remainder, and whose motion – rather than incessant, open ended, and unpredictable – is a stale and mechanical expansion of the same”.<sup>2</sup> Mapped onto the everyday, Alex Callinicos writes, “Dialectical thinking thus sees reality as inherently historical, as a process of constant movement in which existing forms are destroyed by their internal flaws and replaced by new ones.”<sup>3</sup>

As I see it, by merging dialectical thinking into a matter-antimatter frame, the type of dialectical movement in the history of matter-antimatter problem, is actually the much less contained version, the messier less predictable version, and a version that is extremely dynamic as new energies are produced when positive hits negative. For instance, the originary theory of the Big Bang, an excess, or a remainder, is also produced: “During the first fractions of a second of the Big Bang, the hot and dense universe was buzzing with particle-antiparticle pairs popping in and out of existence. If matter and antimatter are created and

destroyed together, it seems the universe should contain nothing but leftover energy.”<sup>4</sup> But, the excess in this case is the matter that remained, creating the universe. Matter-antimatter is dialectical thinking writ as large as possible!

A second point of intersection between the Marxist tradition of dialectical thinking and the matter-antimatter relationship is the relationship each hold to nature. Here I turn to Engels’ *The Dialectics of Nature* and *The Anti-Duhring* in which he continually tried to negotiate the “dialectical conception of nature” which is recognized by “our reflective minds”.<sup>5</sup> Dialectical development was to be found in both nature and society and the science of Marxism could make this clear. Infusing Darwinism with Marxism, and altering it, Engels aimed toward a theory of development that was dialectical. Working to generate general laws, Engels works off of three laws developed by Hegel, noting that Hegel “foisted” these laws onto nature rather than deriving them from nature:

The law of the transformation of quantity into quality and *vice versa*.

The law of the integration of opposites

The law of the negation of the negation<sup>6</sup>

Here, the law of the transformation of quantity into quality runs through the matter-antimatter debate, such as the process of annihilation in which the quantities of an electron and an anti-electron recombine and change quality into pure energy. In a similar vein, Carl D. Anderson’s 1932 paper “The Apparent existence of Easily Deflectable Positives”, sees a quantitative change quality as a positively charged particle passes through a sheet of lead in a Cloud Chamber,

once deflected, the particle has lost or released a quantity of its energy (that is, if I am understanding this experiment correctly). Later, this experiment is interpreted by Richard Feynman to be “ a positron...moving backwards in time.”<sup>7</sup> Anderson’s experiment, read in relation to time, annihilates time – it overcomes the problem of time’s forward march by doing a small jig backwards. From the perspective of Marxist theory, this experiment overcomes the teleology of more orthodox Marxist notions of time and inevitability. I take these experiments to be theoretical workings of the problem of time and development in dialectical thinking – at the same time, they are experiments that challenge governing principles of dialectical thought by bringing these process back into “nature” at its most basic building blocks.

This relationship to nature also provided a point of dialogue with Genevieve Robertson’s body of work, In our first meeting, she was experimenting with paintings made from sea water from the Salish Sea off Stanley Park (she had a residency in the City of Vancouver A-frame at Second beach) as well as oil. Of course this combination of two different materials (thesis – antithesis? Matter-antimatter) carries the reference of the oil pipelines that continue to be possibility as bitumen is shipped from the Alberta Oil Sands to the Port of Vancouver, as well as to refineries in Burnaby.

Thirdly, the constant relation of the positive and the negative, and of negation, as shown in the third law from Engels, runs through dialectical thinking and matter-antimatter processes. At its basis, the matter-antimatter

process is set on positive and negative relationships. This relationship is given a further twist within Marxist thought where we have the wonderfully poetic term of the “negation of the negation” in dialectical thought. This negation is central to development: for Engels, “dialectical negation is (formally) the moving source of all development.” In this, the struggle and resolution of thesis and anti-thesis do not return us to an original point, but at a higher stage. For Engels, “a thesis [equilibrium] is enriched by development of the anti-thesis.” Mapped onto time and history, this process of dialectical thought and negation moves us through development, dealing with contradictions that do not allow a straight development. But, for Hegel, as the old diminished, the new increased. For Theodor Adorno, in his *Negative Dialectics*, to rest at the negation of the negation as a positive, “would no longer permit any dialectical motion.”<sup>8</sup> Instead negation is not a point of development in which the negative is qualitatively changed into a positive, but a vital process of critique. Negation is not a reversal, to produce a positive, but it is a process of critique that refuses to “lend itself to sanctioning things as they are.” (159). Here Adorno is paraphrasing Marx in an Afterward to volume One of *Capital*:

In its mystified form, dialectic became the fashion in Germany, because it seemed to transfigure and to glorify the existing state of things. In its rational form it is a scandal and abomination to bourgeoisdom and its doctrinaire professors, because it includes in its comprehension and affirmative recognition of the existing state of things, at the same time also, the recognition of the negation of that state, of its inevitable breaking up; because it regards every historically developed social form as in fluid movement, and therefore takes into account its transient nature not less than its momentary existence; because it lets nothing impose upon it, and is in its essence critical and revolutionary<sup>9</sup>.

The rational form of the dialectic is a non-resting process of critique and revolution (in thought and society).

Drawing this various aspects of dialectical thought, and its Marxist inflections and use, into the history of matter-antimatter, I see too a nonresting process in which fundamental laws are established, questioned and overturned and a process in which contradictions continually arise and are seen as part of the process. Within the key experiments of matter-antimatter knowledge, a form of dialectical experimentation is at work: opposites are brought together with the result of a qualitative or quantitative change, excess is produced, the march of time is questioned, and an ultimate synthesis is not possible.

My mode of looking at this is through poetic research – which itself does not aim to arrive at a synthesis but instead looks for relational moments. In this, I also see a poetic language emerge form both discourses – matter-antimatter thought and dialectical thinking. For my contribution to *Leaning Out of Windows*, I have tried to combine the scientific aspect of dialectical thinking with the poetic aspect of matter-antimatter thought and experimentation. To do this, I have taken the diagrammatic rendering of Carl Anderson’s experiment which resulted in his 1932 paper, “Apparent Existence of Easily Deflectable Positives” as a model to relate the dialectical thinking at the heart of Marxism and matter-antimatter thought.<sup>10</sup> Anderson’s experiment passed particles through a lead plate within a cloud chamber and photographed their movement. The photogrepah showed a positively charged travelling upward, through the

lead plate: it was the discovery of the positron, an “easily deflectable positive.” Invoking dialectical thinking, I look to bring a negative in relation to Anderson’s positive. In my research, I saw the relation between Adorno’s assertion of negation in relation to the positive: Against this [the “positive-in-itself”], the seriousness of unswerving negation lies in its refusal to lend itself to sanctioning things as they are.”<sup>11</sup> I was drawn to the relationship to movement in Anderson and Adorno: the unswerving negative in relation to the easily deflectable positive. In dialectical thought, this leans toward Adorno’s emphasis on the negative as the greater value. In the diagram of Anderson experiment, the lead plate is represented by a line running the width of the circle, the circle representing the cloud chamber and the swerve of the positive particle is indicated by an arching line moving from bottom to top, passing through the line in the middle. I’ve taken this diagram to be a platform to poetically pose the relationship of a negative and a positive force in the process of social (historical) change). The text in the diagram is: apparent existence of easily deflectable positives”; “the seriousness of unswerving negation” and centrally, “a matter as heavy as lead to pass through”

This diagram is also in dialogue with the works of Lawrence Weiner, whose textual works hold a set of remarkably similar concerns, played out in poetic language. The body of Weiner’s works – generally exhibited as textual works on a gallery wall – speculate on (rather generally) process of change and transformation, of stasis and movement. At the same time, they address social

processes of change and stasis. The Anderson diagram resembles the arcs and lines of a Weiner wall piece, so I have decided to make my work a vinyl wall diagram.

Weiner's work uses the ampersand (&) visually and semantically (his works are also very open), so I have developed a second wall work based on an central ampersand with lines radiating out of it. Passing through the central circle holding the ampersand, there are six spokes. In his lecture to our group, Marcello indicated that "stable things in the universe are made of ...five things": up quarks; down quarks; electrons; photon; and gluon. Using five as a reference to stability, I have texts within five of the spokes, and the sixth made solid with a colour. This model can be used for different variations of text and at the moment I have two texts for this diagram, both reflecting on the process of social change.

Lastly, I'm working on a more conventional poem that moves through the relationship of dialectical thought and matter-anti-matter thought – but it is in process.

<sup>1</sup> <https://home.cern/topics/antimatter/matter-antimatter-asymmetry-problem>. Accessed August 16, 2017.

<sup>2</sup> George Ciccariello-Maher, *Decolonizing Dialectics* (Durham: Duke University Press, 2017) p.110.

<sup>3</sup> Alex Callinocos, *International Socialism*, March 1998. <https://www.marxists.org/history/etol/writers/callinocos/1998/xx/dialectic.htm>. Accessed August 17, 2017.

<sup>4</sup> <https://home.cern/topics/antimatter/matter-antimatter-asymmetry-problem>

<sup>5</sup> Frederick Engels, *The Anti-Duhring*. [https://www.marxists.org/archive/marx/works/download/Engels\\_Anti\\_Duhring.pdf](https://www.marxists.org/archive/marx/works/download/Engels_Anti_Duhring.pdf). Accessed August 17, 2017.

<sup>6</sup> *The Dialectics of Nature*. [https://www.marxists.org/archive/marx/works/download/EngelsDialectics\\_of\\_Nature\\_part.pdf](https://www.marxists.org/archive/marx/works/download/EngelsDialectics_of_Nature_part.pdf). Accessed August 17, 2017.

<sup>7</sup> <https://www.quora.com/What-will-happen-if-I-send-an-electron-back-in-time>. Accessed August 17, 2017.

<sup>8</sup> Theodor Adorno, *Negative Dialectics*. Trans. E.B.Ashton. (New York: Continuum, 1973) p.160.

<sup>9</sup> <https://www.marxists.org/archive/marx/works/download/pdf/Capital-Volume-I.pdf>. P. 15. Accessed August 17, 2017.

<sup>10</sup> Carl D. Anderson, “The Apparent Existence of Easily Deflectable Positives”. *Science*, New Series, Volume 79, No. 1967 (Sept. 9, 1932): pp. 238-239.

<sup>11</sup> Adorno, *Negative Dialectics*. p.159.