

Darwin's Letters: He Would Not Accept Pasteur's Experiments

Darwin and spontaneous generation

It must be said that Darwin was pretty good at speculation and argument, since his entire book, *The Origin of Species*, was one long argument based on his personal observations and conclusions. But it is much harder to say that he was a great scientist, for one reason, because he refused to accept the carefully documented experiments of other scientists. Eleven years after Pasteur had shown conclusively that life only came from life, biogenesis (1859), Darwin was still holding to his theory of abiogenesis – spontaneous generation of life from inert materials. On Pasteur's work, see http://en.wikipedia.org/wiki/Spontaneous_generation.

In his letter dated July 12, 1870 to J. D. Hooker, Darwin insists on believing that even though all microorganisms have been killed by heating, the necessary materials remain there so that they could come back to life later. The first of the embedded footnotes shows that two years later he was still insisting that the remaining molecules could still reconstitute the living organisms.

Darwin also speaks of his theology where he dismisses blind chance but also dismisses design.

 Letter 236. TO J.D. HOOKER.
 Down, July 12th [1870].

Your conclusion that all speculation about preordination is idle waste of time is the only wise one; but how difficult it is not to speculate! My theology is a simple muddle; I cannot look at the universe as the result of blind chance, yet I can see no evidence of beneficent design or indeed of design of any kind, in the details. As for each variation that has ever occurred having been preordained for a special end, I can no more believe in it than that the spot on which each drop of rain falls has been specially ordained. Spontaneous generation seems almost as great a puzzle as preordination. I cannot persuade myself that such a multiplicity of organisms can have been produced, like crystals, in Bastian's¹ solutions of the same kind. I am astonished that, as yet, I have met with no allusion to Wyman's positive statement² Solutions of organic matter in hermetically sealed flasks were immersed in boiling water for various periods. "No infusoria of any kind appeared if the boiling was prolonged beyond a period of five hours.") that if the solutions are boiled for five hours no organisms appear; yet, if my memory serves me, the solutions when opened to air immediately became stocked. Against all evidence, I cannot avoid suspecting that organic
 [page 322]
 particles (my *gemmules* from the separate cells of the lower creatures!) will keep alive and afterwards multiply under proper conditions.
 What an interesting problem it is.

1. On September 2nd, 1872, Mr. Darwin wrote to Mr. Wallace, in reference to the latter's review of *The Beginnings of Life*, by H.C. Bastian (1872), in *Nature*, 1872, pages 284-99:

"At present I should prefer any mad hypothesis, such as that every disintegrated molecule of the lowest forms can reproduce the parent-form; and that these molecules are universally distributed, and that they do not lose their vital power until heated to such a temperature that they decompose like dead organic particles."

2. "Observations and Experiments on Living Organisms in Heated Water," by Jeffries Wyman, Prof. of Anatomy, Harvard Coll. (*Amer. Journ. Sci.* XLIV., 1867, page 152.

The letter above was previously available on the web at
<http://pages.britishlibrary.net/charles.darwin/>.

The footnotes added to the various letters that appear there are very helpful. However, apparently, that is no longer an active site.

The internal descriptive data is as follows:

"The writings of Charles Darwin on the web" by John van Wyhe, apparently entered and formatted from:

F. Darwin & A.C. Seward, eds, *More letters of Charles Darwin*, 2 vols., London, John Murray, 1903.

But see <http://www.gutenberg.org/files/2739/2739-h/2739-h.htm>
 for a free copy of Volume 1, including the letter (and footnotes) appearing below.

A slightly different and more complete version of the letter can currently be seen at Darwin Correspondence Database, <http://www.darwinproject.ac.uk/entry-7273> accessed on Thu Jan 3 2013

but without the added footnotes. Notice that the first three paragraphs of friendly chatter and final line are removed from the letter as it appears above in its footnoted form.

Letter 7273

Darwin to Hooker, J. D.

12 July [1870]

Summary

Has not heard of Curtis on *Dionaea*.

Duke of Argyll is clever, but it is a sin to speak of a real old Duke as a "little beggar".
 "My theology is a simple muddle: I cannot look at the Universe as the result of blind chance, yet I can see no evidence of beneficent Design."

On spontaneous generation and Bastian.

Transcription

Down. | Beckenham | *Kent. S.E.* July 12th

My dear Hooker

Two of the kinds of seeds will be very useful to me; but why the others were sent by Col. Playfair, I know not, except from the abundance of his kindness.—

I am sure I never heard of Curtis' observations on *Dioneæa*; nor have I met with anything more than general statements about this plant or about *Nepenthes* catching insects &c—

I have always thought the D. of Argyll wonderfully clever; but as for calling him “a little beggar” my inherited, instinctive feelings w^d. declare it was a sin thus to speak of a real old Duke.—

Your conclusion that all speculation about preordination is idle waste of time is the only wise one: but how difficult it is not to speculate. My theology is a simple muddle: I cannot look at the Universe as the result of blind chance, yet I can see no evidence of beneficent design, or indeed of design of any kind in the details.—

As for each variation that has ever occurred having been preordained for a special end, I can no believe in it, than that the spot on which each drop of rain falls has been specially ordained.—

Spontaneous generations seems almost as great a puzzle as preordination; I cannot persuade myself that such a multiplicity of organisms can have been produced, like crystals, in Bastian’s solutions of the same kind.— I am astonished that as yet I have met with no allusion to Wyman’s positive statement that if the solutions are boiled for 5 hours, no organisms appear; yet, if my memory serves me, the solutions when opened to air, immediately became stocked. Against all evidence I cannot avoid suspecting that organic particles (my **gemmules** from the separate cells of the lower creatures!) will keep alive & afterwards multiply under proper conditions. What an interesting problem it is.—
Your affect | C. Darwin

His use of the word "preordination" here is interesting. I have not seen other discussions of the likely meaning, but perhaps it relates to the idea that God may have set the parameters for certain designs to be arrived at after a long process of mutations. However, I believe Darwin wanted to remove God from all aspects of the design of biological creatures, one of his goals being to show that God did not have responsibility for any bad results that occurred.

Another interesting, and probably famous, comment by Darwin appears in the letter below concerning "some warm little pond."

Letter 7471

[Darwin](#) to [Hooker, J. D.](#)

1 Feb [1871]

Summary

Returns pamphlets.

B. T. Lowne’s observation [*Mon. Microsc. J.* 4 (1870): 326–30] that boiling does not kill certain moulds is curious, but then how account for absence of all living things in Pasteur’s experiment?

Always delighted to see a word in favour of Pangenesis.

Thiselton-Dyer’s paper ["On spontaneous generation and evolution", *Q. J. Microsc. Sci.* 10 (1870): 333–54] is Spencerian.

The chemical conditions for first production of life are said to exist at present, but in some warm little pond today such matter would be absorbed or devoured, which would not have been the case before living creatures were formed.

Transcription^{f1}

Down. | Beckenham | Kent. S.E.

Febr 1st

My dear Hooker

I return the pamphlets, which I have been very glad to read.— It will be a curious discovery if M^f. Lowne's observation that boiling does not kill certain moulds is proved true; but then how on earth is the absence of all living things in Pasteur's experiment to be accounted for?—^{f2} I am always delighted to see a word in favour of Pangenesis, which some day, I believe, will have a resurrection^{f3} M^f Dyers paper strikes me as a very able Spencerian production.—^{f4}

It is often said that all the conditions for the first production of a living organism are now present, which could ever have been present.— But if (& oh what a big if) we could conceive in some warm little pond with all sorts of ammonia & phosphoric salts,—light, heat, electricity &c present, that a protein compound was chemically formed, ready to undergo still more complex changes, at the present day such matter w^d be instantly devoured, or absorbed, which would not have been the case before living creatures were formed.—

Henrietta makes hardly any progress, & God knows when she will be well.—^{f5}

I enjoyed much the visit of you four Gentlemen, ie after the Saturday night, when I thought I was quite done for.—^{f6}

Yours affec^y | C. Darwin

Footnotes

^{f1}

The year is established by the references to Lowne 1870b and (see nn. 2 and 3, below).

^{f2}

Benjamin Thompson Lowne boiled spores of *Penicillium glaucum* and then placed them in sealed tubes; he found that mycelial filaments were produced after the tubes had been left in a warm place for twenty-four hours. His paper was published in the January 1871 issue of the *Journal of the Quekett Microscopical Club* (Lowne 1870b). In the 1860s, Louis Pasteur had experimented on spontaneous generation. He found that a boiled solution of sugar and yeast remained sterile indefinitely whether kept in a sealed flask or in an unsealed swan-neck flask that kept out atmospheric dust. (*DSB* 10: 369.)

^{f3}

Lowne discussed CD's hypothesis of pangenesis in Lowne 1870b, p. 134. (On pangenesis, see the letter from Francis Galton, 9 January 1871, n. 1.)

^{f4}

William Turner Thiselton-Dyer's paper, 'On spontaneous generation and evolution', appeared in the October 1870 issue of the *Quarterly Journal of Microscopical Science* (Thiselton-Dyer 1870). Thiselton-Dyer cited Herbert Spencer's *Principles of biology* (Spencer 1864–7) frequently in his paper and agreed with Spencer's view that life developed from non-living matter by slow stages.

^{f5}

Emma Darwin's diary (DAR 242) records that Henrietta Emma Darwin had measles on 4 January 1871 and 'came down' on 25 January.

[f6](#)

Emma Darwin's diary (DAR 242) records that Hooker, Albert Günther, Robert Swinhoe, and William Winwood Reade visited Down from Saturday 28 to Monday 30 January 1871.

The letter and footnotes just inserted above can be found at:

Darwin Correspondence Database,

<http://www.darwinproject.ac.uk/entry-7471> accessed on Fri Jan 4 2013

For other related discussion on the "warm little pond" idea

See CARM discussion forums

[http://forums.carm.org/vbb/showthread.php?115621-Fundies-say-the-silliest-things-Pasteur-disproved-](http://forums.carm.org/vbb/showthread.php?115621-Fundies-say-the-silliest-things-Pasteur-disproved-Darwin-s-reigning-OOL-theory)

[Darwin-s-reigning-OOL-theory](#)

accessed on Thu Jan 3 2013

<http://www.darwinproject.ac.uk/editors-blog/2012/02/15/darwins-warm-little-pond/>

accessed on Thu Jan 3 2013