Herschel's Philosophy of Science

Herschel, The Last Polymath, 2024-06-08

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Natural Philosophy.

A PRELIMINARY DISCOURSE

ON

THE STUDY OF NATURAL PHILOSOPHY.

BY

J. F. W. HERSCHEL, ESQ. M.A.

OF ST. JOHN'S COLLEGE, CAMBRIDGE.

Herschel (1830)

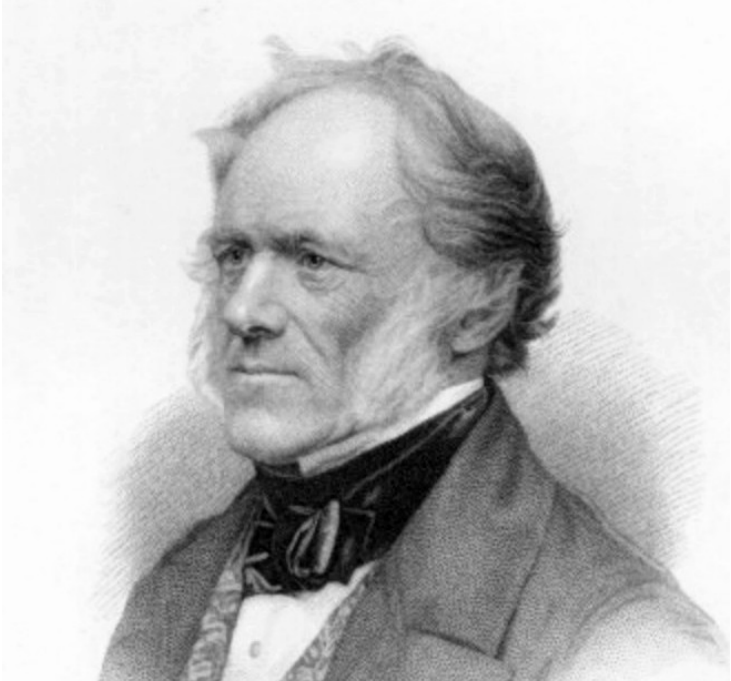
H. Corbould. del.

E. Finden Sculp.

> Far from being a thorough-going inductivist, John Herschel emphasizes not the process by which scientific theories arise but rather the manner in which one tests, draws conclusions from, and evaluates such theories. (Bolt 1998, 41)

But what are these to the astonishing truths which modern optical enquiries have disclosed, which teach us that every point of a medium through which a ray of light passes is affected with a succession of periodical movements, regularly recurring at equal intervals, no less than five hundred millions of millions of times in a single second! (*PD*, §18)

We shall state the helps which may be afforded us, in a work of so much thought and labour, by a methodical course of proceeding, and by a careful notice of those means which have at any time been found successful, with a view to their better understanding and adaptation to other cases: a species of mental induction of no mean utility and extent in itself; inasmuch as by pursuing it alone can we attain a more intimate knowledge than we actually possess of the laws which regulate our study of truth, and of the rules, so far as they extend, to which invention is reducible. (*PD*, §108)



Charles Lyell

Herschel on Lyell

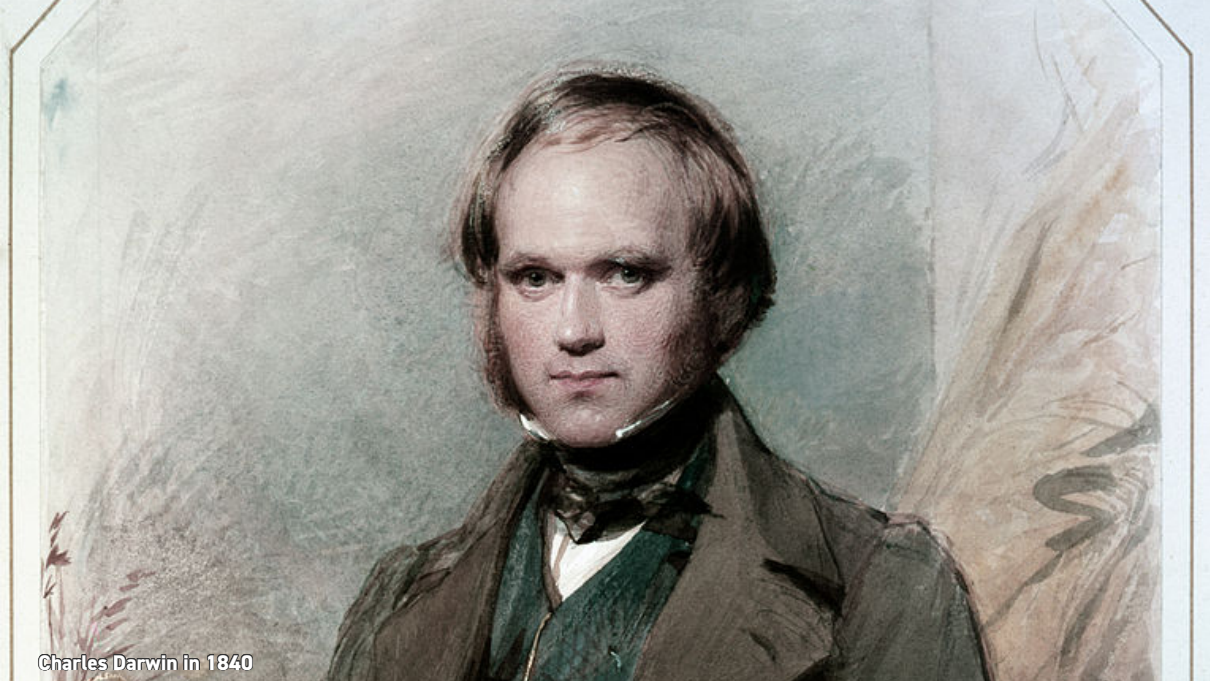
A cause, possessing the essential requisites of a *vera causa*, has, however, been brought forward [by Lyell]... the degradation of the old continents, and the elevation of new, being a demonstrated fact; and the influence of such a change on the climates of particular regions, if not of the whole globe, being a perfectly fair conclusion, from what we know of continental, insular, and oceanic climates by actual observation. Here, then, we have, at least, a cause on which a philosopher may consent to reason. (*PD*, §139)

Herschel on Lyell

> I hope your example will be followed in other sciences, of trying what can be done by existing causes, in place of giving way to the indolent weakness of a priori dogmatism – and as the basis of all further procedure enquiring what existing causes really are doing. (letter, 1836, in Cannon 1961)

Lyell on Herschel

> I may truly say that when the Royal Society voted me a medal for my book, I was not more gratified nor more encouraged than by your full and interesting comments which have given me a feeling of strength and confidence in myself, which will assist me in my future studies. (letter, 1836, in Cannon 1961)



Charles Darwin in 1840

Darwin Following Herschel

Three major parts of the *Origin*:

1. Establish natural selection as a *vera causa*
2. Establish the adequacy of natural selection to produce the observed phenomena
3. Extend the application of natural selection "to cases not originally contemplated" (*PD*, §176)

Herschel on Darwin

> I have heard by round about channel that Herschel says my Book ‘is the law of higgledy-pigglety.’ – What this exactly means I do not know, but it is evidently very contemptuous. – If true this is great blow & discouragement. (Darwin to Lyell, 1859)

Michael Faraday

Faraday on Herschel

I have the more pleasure in receiving your commendation than that of another person – not merely because there are few whose approbation I should compare with yours but for another circumstance. When your work on the study of Nat. Phil. [the *PD*] came out, I read it as all others did with delight. I took it as a school book for philosophers and I feel that it has made me a better reasoner & even experimenter and has altogether heightened my character and made me if I may be permitted to say so a better philosopher. (letter, 1832)

Herschel on Faraday

You will be disposed to ask to what all this tends. Assuredly not to interfere for a moment with your claim to a beautiful discovery (for, though I may regret that I did not prosecute a train of enquiry which seemed so promising up to a decisive fact I consider it honour enough to have entertained a conception which your researches have converted into a reality) - but if it be not presumptuous in me to suggest a line of enquiry to you - I would willingly draw your attention to the other member of the triple coincidence above alluded to[.] (letter, 1845)

Summing Up

Herschel's standards for scientific methodology and scientific character are crucial for some of the most important figures in nineteenth-century science; those figures, in turn, shaped a "Herschellian" philosophy of science that would become one of the most important products of this period.

Questions?

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