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Tamás Demeter

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Abstract

In this paper I attempt to reconstruct David Hume's use of the label 'experimental' to characterise his method in the *Treatise*. Although its meaning may strike the present-day reader as unusual, such a reconstruction is possible from the background of eighteenth-century practices and concepts of natural inquiry. As I argue, Hume's inquiries into human nature are experimental not primarily because of the way the empirical data he uses are produced, but because of the way those data are theoretically processed. He seems to follow a method of analysis and synthesis quite similar to the one advertised in Newton's *Opticks*, which profoundly influenced eighteenth-century natural and moral philosophy. This method brings him much closer to the methods of qualitative, chemical investigations than to mechanical approaches to both nature and human nature.

I. Introduction

The adjective 'experimental' with which Hume characterises his method in the subtitle of his *Treatise of Human Nature* is far from being unequivocal. According to a widespread interpretation it refers formally to Newton, and it indicates nothing more than that Hume, like many of his contemporaries, aspired to be as significant for the moral sciences as Newton was for natural philosophy.¹ It is also frequently suggested that the label 'experimental' simply declares Hume's empiricism, and does not imply anything beyond 'experiential': it suggests a method that takes private experience as its starting point and argues from there –² as opposed to starting from *a priori* insights and proceeding in a rationalistic guise. Accepting either of these interpretations, one could go even further and conclude that Hume's commitment to an 'experimental method' is nothing more than a marketing trick played in order to secure a respectable position for his work in an intellectual climate dominated by Newtonians on the one hand, and a 'culture of fact' on the other.³

Accepting these interpretations, however, makes it impossible to account for some eighteenth-century evaluations of Hume's enterprise, which regard him as being the only one who ever applied the experimental method with any success in this field.⁴ And it is also impossible to give a charitable reading of what his subtitle, 'An Attempt to Introduce the Experimental Method of Reasoning into Moral Subjects', could mean. Some who take Hume and his experimental method more literally emphasized parallels with Newton while others have argued that his intellectual debts should be paid to Boyle instead.⁵ Others believe that his work is most properly placed within a tradition that applies the Baconian methods of natural history in moral inquiry, a tradition that had begun with Locke and flourished in Scotland at that time.⁶ Recently it has also been suggested that Hume, in a similar vein to Buffon, adopts a critical stance towards the mechanical and mathematical foundations of experimental natural philosophy as it was envisaged in the seventeenth and early eighteenth centuries.⁷

As Hume nowhere gives a sufficiently detailed summary of his method, it takes some effort to find out what epistemic ideals he had in mind while developing his theory of human nature. In this paper I intend to reconstruct what 'experimental' might mean to Hume with an attention to

¹ See e.g. Margaret Schabas, *The Natural Origins of Economics* (Chicago: University of Chicago Press, 2005) 80.

² See e.g. Gary Hatfield, 'Remaking the Science of Mind: Psychology as Natural Science', in *Inventing Human Science*, edited by Christopher Fox, Roy Porter and Robert Wokler (Berkeley: University of California Press, 1995) 208.

³ Reinhard Brandt, 'Philosophical Methods', in *The Cambridge History of Eighteenth-Century Philosophy*, edited by Knud Haakonssen (Cambridge: Cambridge University Press, 2006) 143.

⁴ David Allan, *Virtue, Learning and the Scottish Enlightenment* (Edinburgh: Edinburgh University Press, 1993) 154.

⁵ See Michael Barfoot, 'Hume and the Culture of Science', in *Studies in the Philosophy of Scottish Enlightenment*, edited by M.A. Stewart. (Oxford: Clarendon Press, 1990) and Eugene Sapidin, 'A Note on Newton, Boyle, and Hume's 'Experimental Method'', *Hume Studies* 23 (1997): 337-344.

⁶ See Paul Wood, 'The Natural History of Man in the Scottish Enlightenment', *History of Science* 28 (1990): 89-123.

⁷ Peter Hanns Reill, *Vitalizing Nature in the Enlightenment* (Berkeley: University of California Press 2005) 37f.

the context of eighteenth-century experimental philosophy. I will do so with a double focus following then common Baconian division of knowledge,⁸ which presumed a distinction between historical and philosophical modes of inquiry. History, both civil and natural, was a descriptive and classificatory enterprise relying on observation and experimentation. The descriptions historical inquiry produced were considered to be the raw material of philosophical inquiry into the principles and causes of phenomena for the purposes of explanation. Searching for underlying causes is a preoccupation of natural as well as of moral philosophy, where the latter investigates *phenomena relating to moral beings*, and not exclusively morality. And while these two kinds of inquiry started to merge in the eighteenth century,⁹ it will serve as a good guide to understanding Hume's method.

In this paper I intend to reconstruct what the label 'experimental' could mean in the context of the *Treatise*. Although its meaning may strike the present-day reader as unusual, such a reconstruction is possible from the background of eighteenth-century practices and concepts of natural inquiry. As I shall argue here, Hume's inquiries into human nature are experimental not primarily because of the way he produced empirical data, but because of the way those data are theoretically processed. He seems to follow a method of analysis and synthesis quite similar to the one advertised in Newton's *Opticks*, which profoundly influenced eighteenth-century natural and moral philosophy. This method brings him much closer to the methods of qualitative, chemical investigations than to mechanical approaches to both nature and human nature.

II. *The Historical Pillar of Hume's Method*

The empirical raw material from which Hume constructs a theory of human nature is descriptive and historical in character. Already in the Introduction of the *Treatise* he suggests we should 'glean up our experiments in this science from a cautious observation of human life' (*THN* Introduction.10),¹⁰ which seems analogous with natural historical observation and description transposed into the sphere of moral phenomena. This *third-person, observer account* of human life is Hume's main methodological pillar. It is most clearly manifested in several passages of Book 2, discussing passions, in which he frequently refers to the common course of behaviour, typically in three contexts: either as a resource of phenomena to be accounted for in terms of the

⁸ For a diagrammatic overview see Sachiko Kusakawa, 'Bacon's Classification of Knowledge', in *The Cambridge Companion to Bacon*, edited by Markku Peltonen (Cambridge: Cambridge University Press 1996) 69.

⁹ See John Gascoigne, 'The Study of Nature', in *The Cambridge History of Eighteenth-Century Philosophy*, edited by Knud Haakonssen (Cambridge: Cambridge University Press 2006) 863f.

¹⁰ David Hume's works are quoted from the Clarendon Edition: *Treatise of Human Nature* (*THN*), edited by David Fate Norton and Mary J. Norton (Oxford: Clarendon Press, 2007), following the form: book.part.section.paragraph. His *Enquiries concerning Human Understanding* (*EHU*), edited by Tom Beauchamp (Oxford: Clarendon Press, 2000); *Enquiries concerning the Principles of Morals* (*EPM*), edited by Tom Beauchamp (Oxford: Clarendon Press, 2000) are quoted as: section.paragraph.

principles of human nature, or as a stock of confirming evidence supporting his explanatory constructs, or as seemingly contrary evidences to be explained away.

One should also add, that for Hume observation is not only a method of detached, third-person inquiry, but it also belongs to the *second-person, participant perspective* as is manifested in how we interact with one another. Observation is also the way in which we learn the regularities characteristic to human behaviour *in general*; it belongs to the course of common practice as well as to the proper foundation of philosophical reasoning (see *THN* 2.3.1.15; *EHU* 8.18). Observation of human life is thus the point where inquiry and common life turn out to be continuous, the only difference being that the former is reflective, systematic and theory-oriented whereas the other is unreflective, sporadic and practice-oriented. This continuity is clearly illustrated when Hume (*THN* 3.2.9.4) discusses the nature of political obligation: he supports his philosophical account with examples of the behaviour of common people who act based on the principles Hume discusses even if they cannot articulate them.

Should Hume's method of studying human nature rely on observation only, it would be hard to see, how it could deserve the label 'experimental' – if it is to entail anything more than 'experiential'. And indeed, the historical foundations of his method comprise two further empirical sources that may clarify the meaning of 'experimental' here. The first is *human history*:

Its chief use is only to discover the constant and universal principles of human nature, by showing men in all varieties of circumstances and situations, and furnishing us with materials from which we may form our observations and become acquainted with the regular springs of human action and behaviour. These records of wars, intrigues, factions, and revolutions, are so many collections of experiments, by which the politician or moral philosopher fixes the principles of his science, in the same manner as the physician or natural philosopher becomes acquainted with the nature of plants, minerals, and other external objects, by the experiments which he forms concerning them. Nor are the earth, water, and other elements, examined by Aristotle, and Hippocrates, more like to those which at present lie under our observation than the men described by Polybius and Tacitus are to those who now govern the world. (*EHU* 8.7)

There are two interesting points to note about this passage in the present context. First, it treats historiography as providing data methodologically analogous with experiment in an important way: both would present its objects in various situations and furnish us with empirical material on which to theorise. If our focus is on human nature, then it is history that provides us with the variation of circumstances in which the causal contribution of its ingredients can be identified and studied.

Secondly, history establishes theoretical conclusions in very much the same way as natural history, meaning that moral and natural philosophies are methodologically continuous. In the light of the above passage it is easy to conceive of historians as reporting experiments made on

human nature – and while there may be no experimenter, there are reported events that can be treated as experiments. Therefore, ‘experiment’ in this context may well be metaphorical, but what really matters is that historical records are *methodological* equivalents of detailed experimental histories. Methodologically speaking, a moral philosopher can use historical works in very much the same way as a natural philosopher can rely on experimental histories produced by others. Newton, for example, selected from among Boyle’s and Hooke’s experimental findings to juxtapose them with available optical theories so as to gain new insights while working on his own theory of light. This is, as Kuhn says, ‘a non-Baconian use of Baconian experiment’:¹¹ it proceeds not inductively but by contrasting empirical material with existing theories. But it is also a practice quite consistent with the use of history Hume proposes in the study of human nature, both in its use of second-hand experience and in its juxtaposition of experience with existing theories. What thus becomes crucial in each case is to identify the relevant and reliable parts of histories. This poses a common problem, again, to both moral and natural philosophies, one not to be discussed here, namely the role of testimony in cognition.¹²

As history ‘extends our experience to all past ages, and to the most distant nation; making them contribute as much to our improvement in wisdom, as if they had actually lain under our observation’ it adds to the pool of first-hand observations on human life so that ‘[a] man acquainted with history may, in some respect, be said to have lived from the beginning of the world, and to have been making continual additions to his stock of knowledge in every country’.¹³ Although history is thus continuous with direct observation, it still surpasses the philosophical importance of observing particular cases, because it offers richer and more conclusive empirical material for philosophical reasoning. As Hume sees it, history allows for observing how some general transformation in the circumstances would exert influence on the thinking and behaviour of entire populations, and this is what makes politics as a science possible. By reporting large-scale transformations historiography presents several cases of a cause followed by an effect, and thus it provides a much broader and more effective basis for inductive generalisations than everyday experience or the observation of particular instances. The latter ones are much more likely to deviate from general regularities due to the influence of idiosyncratic circumstances,¹⁴ and they are thus less reliable sources for inferring the principles of

¹¹ Thomas Kuhn, ‘Mathematical versus Experimental Traditions in the Development of Physical Science’, in *The Essential Tension* (Chicago: University of Chicago Press 1976) 50.

¹² Whereas I do not have the space to discuss this problem here, Hume certainly does it in the *EHU*’s chapter ‘Of Miracles’.

¹³ David Hume, ‘Of the Study of History’, in *Essays, Moral, Political and Literary*, vol. 2., edited by T.H. Green and T.H. Grose (London 1882) 390.

¹⁴ David Hume, ‘Of the Rise and Progress of the Arts and Sciences’, in *Essays, Moral, Political and Literary*, vol. 1., edited by T.H. Green and T.H. Grose (London 1882) 175ff.

human nature.

There are, however, important and obvious dissimilarities between historical events and experiments. As Hume sees clearly, it is impossible in the field of moral philosophy to conduct experiments 'purposely, with premeditation' (*THN* Introduction.10). Since the seventeenth century, 'experimental' partly meant, as Kuhn has Bacon say, 'twisting the lion's tail', 'torturing' nature,¹⁵ i.e. producing situations that would not exist in nature without human intervention, that is, it increasingly meant an artificial step in knowledge production. As Hume indicates, this kind of experiment, i.e. contrived experience, has only limited availability in the science of man. Social experiments, comparable to those of historical events, are impracticable, and one could also argue that the relevant experiments would distort the principles of human nature as does introspection (*THN* Introduction.10; *EHU* 1.13). And this indicates a limitation on an experimental science of human nature. Without contrived experience asking specific questions about the reliability of a theory of human nature is hardly possible.

One might think that denying the possibility of manipulative intervention with the hope of cognitive benefit is devastating for Hume's attempt at finding a proper experimental footing for his project, so 'experimental' for Hume 'meant no more and no less than an appeal to experience in support of his claims'.¹⁶ As contrived experiments cannot play a role, it is impossible to design a Newtonian *experimentum crucis* to test alternative propositions as well as to follow the Boylean way of experimental fact-collecting for the purposes of subsequent philosophical processing. What seems to remain is only a very general and unspecific sense of 'experimental' meaning something akin to Baconian natural, but not experimental, history: i.e. fact-collecting and systematic observation.

But, *pace* Wood,¹⁷ this Baconian stance does not inform Hume's actual practice. At the time of writing the *Treatise*, i.e. much before he devoted himself to writing his history of England, he had had substantial knowledge of history,¹⁸ yet he never proceeds by listing 'experiments', taken from history or contemporary observation, in order to infer on this basis inductively his theoretical insights – something one would expect from a faithful Baconian. Instead, he is using both history and observation as sources of *experimenta crucis*: showing the explanatory strength and plausibility of his theory by comparing and contrasting phenomena to assess the truth or falsehood of alternative explanations. An explicit example is his discussion of why love is always followed by benevolence and hatred by anger when he contrasts two possible hypotheses and decides

¹⁵ Kuhn, *op. cit.*, 44.

¹⁶ Hatfield, *op. cit.* 208.

¹⁷ Wood, *op. cit.* 98f.

¹⁸ Roger L. Emerson, 'Hume's Intellectual Development: Part II', in *Essays on David Hume, Medical Men and the Scottish Enlightenment* (Aldershot: Ashgate 2009).

between them on the basis of observation (*THN* 2.2.6.3f). Instead of accumulating several examples Hume carefully chooses cases he considers crucial in a given context and highlights features that make them especially relevant in his account. It is thus not the way in which empirical material for theory building is gained, but the *methodological role* it plays that makes this material experimental.

There is another possible source of ‘experiments’ which Hume does not make use of. *Travel writing* was already important for Locke’s historical explorations of human understanding,¹⁹ and in the seventeenth and eighteenth centuries this genre was generally conceived as a rich collection of ‘human experiments’. At the end of the period Edmund Burke sees its importance so great that for him it replaces history in the science of man because it can reveal ‘the great map of mankind’.²⁰ One could thus wonder why Hume does not ascribe to it a weight at least similar to that of history. One reason is given in an essay where he argues that the differences among various nations are to be explained *exclusively by moral causes*,²¹ i.e. in terms of the customs, institutions, morality and system of rules etc. prevailing in a given group, and denies, *pace* Montesquieu, that physical causes like climate, available food, etc. could influence these. Another reason may be that travel writing can grasp neither the development of moral causes diachronically, nor distinguish what reflects human nature versus local custom. The interaction of moral causes can be revealed only diachronically, so travel writing is practically useless as it offers a description of the present state of affairs, not the process by which it has emerged. Therefore its capacity to serve as an experimental basis for philosophical inquiry is even more limited than that of history.

III. The Philosophical Pillar of Hume’s Method

In the modern sense, as we have just seen, the prospects of providing an experimental basis for Hume’s science of man is fairly limited, as ‘experiments’ here cannot arise from an intervention into the normal course of human nature, which would render the findings useless anyway. However, Hume is much less concerned with how empirical material is to be gained than with how it is to be processed. It is thus not primarily the meaning of ‘experimental’ that should be clarified in its own right, but rather the entire phrase, *experimental method of reasoning*, as it reads in the subtitle of the *Treatise*.

¹⁹ John Locke, *An Essay concerning Human Understanding*, edited by Peter Nidditch (Oxford: Clarendon Press 1975) 1.2.9.

²⁰ Peter J. Marshall and Glyndwr Williams, *The Great Map of Mankind: Perceptions of the New Worlds in the Age of Enlightenment* (Cambridge, Mass.: Harvard University Press 1982) 93.

²¹ David Hume, ‘Of National Characters’, in *Essays, Moral, Political and Literary*, vol 1., edited by T.H. Green and T.H. Grose (London 1882) 246ff.

It is quite clear from some of Hume's passages that his method is intended to be contrasted with *a priori* and geometrical methods – for example, the one which Hobbes (1845, 184) had found appropriate for his civil philosophy,²² or Descartes's method of searching for clear and distinct principles in order to construct theories in an intuitive and deductive way.²³ In the light of the subject's nature Hume finds this kind of method wanting in comparison with an experimental approach:

we can only expect success, by following the experimental method, and deducing general maxims from a comparison of particular instances. The other scientific method, where a general abstract principle is first established, and is afterwards branched out into a variety of inferences and conclusions, may be more perfect in itself, but suits less the imperfection of human nature, and is a common source of illusion and mistake in this as well as in other subjects. (*EPM* 1.10)

For Hume (e.g. *EHU* 4.10ff), a demonstrative ideal of inquiry, which proceeds in an *a priori* manner from allegedly clear definitions or indubitable propositions, is of no use if one is in the business of an empirically founded science of man. It can be useful only in constructing explanations once we have knowledge of the principles of human nature, but such knowledge can be gained only from experience, and not in an *a priori* way.

Hume's attitude is consonant with the rejection of 'speculative' in favour of 'experimental philosophy' which, as Thomas Sprat explains while writing the history of the Royal Society, was the innovation setting the new philosophy apart from previous approaches to nature.²⁴ This is how Newton, in a draft of a letter to Cotes, discriminates his position from alternative strategies in natural philosophy:

Experimental philosophy reduces phenomena to general rules and looks upon the rules to be general when they hold generally in phenomena. ... Hypothetical philosophy consists in imaginary explications of things and imaginary arguments for or against such explications, or against the arguments of experimental philosophers founded upon induction. The first sort of philosophy is followed by me, the latter too much by Descartes, Leibniz, and some others.²⁵

And it is indeed the perception of the inferiority of speculative approaches that motivates Hume in undertaking the enterprise of founding moral philosophy on an experimental basis. The broadest outlines of his methodological intentions are made clear in an early letter of March 1734:

I found that the moral Philosophy transmitted to us by Antiquity, labour'd much under the same Inconvenience that has been found in their natural Philosophy, of being entirely

²² See Thomas Hobbes, 'Six Lessons to the Savilian Professors of the Mathematics', in *The English Works of Thomas Hobbes of Malmesbury*, vol. 7, edited by William Molesworth. (London: Longman, Brown, Green and Longmans 1845) 184.

²³ See Daniel Garber, 'Descartes and Method in 1637', in *Descartes Embodied* (Cambridge: Cambridge University Press 2000) 37.

²⁴ Thomas Sprat, *History of the Royal Society* (London 1667) 341.

²⁵ See Isaac Newton, *Philosophical Writings*, edited by Andrew Janiak (Cambridge: Cambridge University Press 2004) 120f.

Hypothetical, & depending more upon Invention than Experience. Every one consulted his Fancy in erecting Schemes of Virtue & of Happiness, without regarding human Nature, upon which every moral Conclusion must depend. This therefore I resolved to make my principal Study, & the Source from which I wou'd derive every Truth in Criticism as well as Morality.²⁶

For Hume the experimental method of reasoning aims at *revealing the underlying causes* of phenomena to explain the regularities of both nature and human nature in terms of principles knowable from a human point of view. And the project is to reveal from observable phenomena these explanatory principles that are themselves not observable, and to resolve them into more and more general ones:

'tis at least worth while to try if the science of *man* will not admit of the same accuracy which several parts of natural philosophy are found susceptible of. There seems to be all reason in the world to imagine that it may be carried to the greatest degree of exactness. If, in examining several phænomena, we find that they resolve themselves into one common principle, and can trace this principle into another, we shall at last arrive at those few principles, on which all the rest depend. And tho' we can never arrive at the ultimate principles, 'tis a satisfaction to go as far as our faculties will allow us. (*THN* Abstract.1)

So while the inquiry may not result in knowledge of some human essence, it can satisfy our curiosity and it can be useful as well. The science of man, like any other science 'is to teach us, how to control and regulate future events by their causes,' (*EHU* 7.29) so that we can apply this knowledge in the interest of society (see *EHU* 1.9). This knowledge is thus both *instrumental and subjectively satisfactory*, but it is not knowledge of the ultimate first principles of human nature.

'All the logic' (*THN* 1.3.15.11) he follows in this inquiry is summarised as a set of rules to regulate the explorations of causes, rules that are equally uniform for both natural and moral philosophy. These rules are applied in both fields

to reduce the principles, productive of natural phænomena, to a greater simplicity, and to resolve the many particular effects into a few general causes, by means of reasonings from analogy, experience, and observation. (*EHU* 4.12)

Finding analogies between different instances gives the chance of explaining causes and reducing them to 'more general principles' (*THN* Appendix.3). Hume also clarifies how to use the experimental basis in analogical reasoning so as to arrive at the principles of human nature and the explanation of human phenomena. The method here is a kind of *analysis and synthesis*:

By means of this guide [i.e. historical and everyday observations of human behaviour], we mount up to the knowledge of men's inclinations and motives, from their actions, expressions, and even gestures; and again descend to the interpretation of their actions from our knowledge of their motives and inclinations. The general observations treasured up by a course of experience, give us the clue of human nature, and teach us to unravel all its intricacies. (*EHU* 8.9)

²⁶ *Letters of David Hume*, vol. 1, edited by J.Y.T. Greig (Oxford: Clarendon Press 1932) 16.

Although the exact terms of analysis and synthesis do not figure here, the terms 'mounting up' and 'descending' belong to the same ballpark of concepts as analysis and synthesis, and they are applied especially in the context of searching for causes.²⁷

This method of exploring the understanding by the 'exact analysis of its powers and capacity' (EHU 1.12) is not an exclusively philosophical method: it is continuous with the everyday way of finding out what is on someone else's mind.

When I see the *effects* of passion in the voice and gesture of any person, my mind immediately passes from these effects to their causes, and forms such a lively idea of the passion, as is presently converted into the passion itself. In like manner, when I perceive the *causes* of any emotion, my mind is convey'd to the effects, and is actuated with a like emotion. ... No passion of another discovers itself immediately to the mind. We are only sensible of its causes or effects. From *these* we infer the passion: And consequently *these* give rise to our sympathy. (THN 3.3.1.7)

The difference between philosophical inquiry and everyday 'mind reading' is that in the latter case we infer the *contents* of the other's mind, while in the former we aim at revealing the general causal *principles* underlying these phenomena. While doing philosophy we just give up the participant's position for the observer's, and start searching for regularities instead of occurrent mental states, but our methods of so doing are similar in both cases.

Overlooking the centrality of this descending and ascending method in Hume can lead to the unjust allegation that there is a general instability in his thought resulting from the unclear relation between the science of man and history: the principles of the former sometimes seem to follow from historical observations, sometimes they serve as the explanation of historical events.²⁸ This is, however, not due to any intrinsic instability in Hume's thought, but results from the methodological status of the principles themselves. We gain them from phenomena in the phase of analysis by comparative means, but in the phase of synthesis we use them for the purposes of explanation. The perspective reverses itself in the two phases: in the first it turns from phenomena to principles, in the second from principles to phenomena. The epistemic aims are thus different: by analysis we aim at lawlike *principles*, by synthesis we aim at the *explanation* of phenomena by deriving them from these principles.

The methodological core idea is now visible. Human phenomena are collected from history and observation, and then compared; if analogies and similarities are found, they are ascribed to some principles of human nature that are also compared, grouped and resolved into more general ones. Once phenomena are analysed into their causal springs, the resulting principles can be construed for the purposes of explanation thereby satisfying our curiosity and facilitating the

²⁷ See Lisa Jardine, *Francis Bacon and the Art of Discourse* (Cambridge: Cambridge University Press 1974) 249f.

²⁸ See Leon Pompa, *Human Nature and Historical Knowledge: Hume, Hegel and Vico* (Cambridge: Cambridge University Press 1990) 21 and 36f.

improvement of society – without the possibility of ultimate knowledge of human essence. As the principles Hume looks for lay behind observable phenomena, there is inevitably a degree of uncertainty and fallibility in the results that this inquiry may deliver:

we must distinguish exactly betwixt the phænomenon itself, and the causes, which I shall assign for it; and must not imagine from any uncertainty in the latter, that the former is also uncertain. The phænomenon may be real, tho' my explication be chimerical. The falsehood of the one is no consequence of that of the other. (*THN* 1.2.5.19)

Due to this fallibility, the ingredients of human nature can be supposed to be fundamentally uniform only in a methodological and fallible, as opposed to some essentialist, sense – just like the fundamental elements of the world are supposed to be unchanged in our natural inquires (see *EHU* 8.7, quoted above). This is a conviction Hume expresses in the quote above on the methodological role of history, and he also says it quite straightforwardly elsewhere:

nature has preserv'd a great resemblance among all human creatures, and that we never remark any passion or principle in others, of which, in some degree or other, we may not find a parallel in ourselves. The case is the same with the fabric of the mind, as with that of the body. However the parts may differ in shape or size, their structure and composition are in general the same. There is a very remarkable resemblance, which preserves itself amidst all their variety. (*THN* 2.1.11.5)

This commitment to the *structural uniformity of human nature* arises from his rules 4 and 5 (*THN* 1.3.15.6f), which claim that the same effect must be traced back to some similarity in their causes, a conviction which is retained in the study of human nature, too: 'human nature remains still the same, in its principles and operations. The same motives always produce the same actions: The same events follow from the same causes.'²⁹ (*EHU* 8.7)

This commitment ensures that it is sensible to look for the components of this fundamental structure or regularity in human nature, a commitment similar to that of the natural philosopher. This is thus a methodological *sine qua non* for exploring the natural historical category of a moral being, and not, *pace* Roger Smith,³⁰ an *a priori* category of a universal human nature in the substantive sense of a human essence. What Hume's project presupposes is not that human beings are the same *sans phrase*, only that there is a descriptive, natural historical category, based on the similarities of its members which are constituted by qualitatively similar ingredients accessible by comparative methods. And this is what specifies the cognitive benefit to be expected from Hume's science of man: the 'delineation of the distinct parts and powers of the mind' (*EHU* 1.13).

Methodologically speaking this is a commitment to processing empirical material on the

²⁹ Hume in these passages seems to echo Newton's 'Rules for the Study of Natural Philosophy' in Newton, *op. cit.*, 87ff.

³⁰ Roger Smith, 'The Language of Human Nature', in *Inventing Human Science*, edited by Christopher Fox, Roy Porter and Robert Wokler (Berkeley: University of California Press, 1995) 89.

assumption of structural uniformity, with an attention to the causal contribution of structural elements, or in other words: identifying the functional ingredients of human nature and their characteristic role in producing human action and internal functioning. This inquiry yields the principles of human nature to be relied on in the explanations of moral philosophy, and therefore these structurally fundamental principles of human nature are the proper aim of inquiry in the science of man. Even though on the most widespread interpretation 'Hume rejected faculty psychology ... and saw the mind instead as a single chain of basic impressions and ideas',³¹ these principles are indeed subsumed under specific faculties like reason, imagination, sympathy, etc. whose interaction explains why our impressions and ideas follow one another in the chain in the order they do.

There are other less stable principles playing an important role here:

I must distinguish in the imagination betwixt the principles which are permanent, irresistible and universal; such as the customary transition from causes to effects, and from effects to causes: And the principles, which are changeable, weak, and irregular; ... The former are the foundation of all our thoughts and actions, so that upon their removal human nature must immediately perish and go to ruin. (*THN* 1.4.4.1)

Some principles of imagination are then constitutive of human nature, but some others are just contingent on culture, history or can even be idiosyncrasies, and can end up in superstitions or philosophical chimeras like presupposing 'substance' as the bearer of properties in scholastic metaphysics. So while the universal principles provide the general framework, on their basis various circumstances inculcate particular ones. This explains why certain virtues, like e.g. courage, are evaluated differently in different historical periods (*EPM* 7.11ff), and also why a human-like creature without sympathy, however contingent its degree and direction may be, would count as a 'monster' not a 'man' (*EPM* 6.1f). It is thus apt to say that while the framework is universal, its content is to a high degree contingent. This amounts to saying that Hume's account has both universalistic and particularistic elements in it, and it sheds a sharp light on the methodological role history plays: it is only from a diachronic perspective, through the study of change, that universal and contingent features of human nature can be separated.

IV. Hume's Newtonianism

The question of Hume's Newtonianism has tormented Hume scholars for several decades.³² There are some respects, indeed, in which Hume's method can be compared to that of Newton's

³¹ Thomas Dixon, *From Passions to Emotions: The Creation of a Secular Psychological Category* (Cambridge: Cambridge University Press 2003) 107.

³² For an overview of the problem see Eric Schliesser, 'Hume's Newtonianism and Anti-Newtonianism', in *The Stanford Encyclopedia of Philosophy* (Winter 2008 Edition), edited by Edward N. Zalta. <http://plato.stanford.edu/archives/win2008/entries/hume-newton/>.

Principia [1687]. Among these one can mention the rules we have just seen in Hume, i.e. same effect – same cause and *vice versa*, which figures among those Newton puts forward in the second and third editions of the *Principia*.³³ This seems to be a rule of inference they both follow in their explorations of the causes which underlie phenomena. Furthermore, they both acknowledge that their philosophies have limits in accounting for phenomena, and admit that they cannot provide the ultimate causes of the laws or principles they reveal in their causal background (see *THN* Abstract.1). They also both refuse to enter into empirically ungrounded speculations, i.e. ones that are not gained by the analysis of phenomena. These are, however, superficial methodological similarities that would not give support to the idea of a substantially Newtonian method in Hume.

Actually, if one takes the *Principia* as the model of Newtonian method, one should also conclude that Hume's method is not Newtonian. In the first two books of the *Principia* Newton's axioms or laws of motion are put forward as 'inference-tickets' allowing him to make inferences from motions to forces and conversely, and from macrophysical to microphysical forces.³⁴ There are no such inference-tickets in Hume, no sign of similar theoretical structure envisaged as an axiomatic Procrustean bed into which observed phenomena are forced. The *Principia* fits nicely with the ancient axiomatic-mathematical tradition of natural philosophy,³⁵ it is *essentially mathematical*.³⁶ It bases the principles of natural philosophy on those of mathematics, and successfully combines the mathematical tradition with the experimental approach. The success is due to the nature of Newton's project in the *Principia*, that is to calculate an unknown quantity from a set of known parameters. This is why Newton's axiomatic system makes experimental data suitable for algebraic treatment.³⁷

This axiomatic-mathematical-quantifying outlook is entirely missing from Hume, and it is very hard to see how his work could be integrated with that at all. The principles Hume invokes in exploring human phenomena are not quantifiable. Perception, imagination, reason etc. are various faculties of the mind whose interaction results in ideas and impressions causing behaviour, but their contribution can hardly be measured and the principles of their interaction can hardly be quantified – not even in principle. So their relations cannot be represented in an algebraic way, in terms of relations of quantities either. Instead, they are *qualitatively* different

³³ See Isaac Newton, *Philosophical Writings*, edited by Andrew Janiak (Cambridge: Cambridge University Press 2004) 87.

³⁴ See George E. Smith, 'The Methodology of the *Principia*', in *The Cambridge Companion to Newton*, edited by I.B. Cohen and George E. Smith (Cambridge: Cambridge University Press 2002) 143.

³⁵ See Kuhn, *op. cit.*, 41 and Peter Dear, *Discipline and Experience* (Chicago: University of Chicago Press 1995) 242.

³⁶ See I. Bernard Cohen, 'The Case of the Missing Author', in *Isaac Newton's Natural Philosophy*, edited by Jed Z. Buchwald and I. Bernard Cohen (Cambridge, Mass.: MIT Press 2001) 22f.

³⁷ See Márta Fehér, 'The Method of Analysis-Synthesis and the Structure of Causal Explanation in Newton', *International Studies in the Philosophy of Science* 1 (1986): 60-84.

principles of human nature, and the explanation of human phenomena consists in a description of how these principles with their distinctive characteristics figure in producing them.

The qualitative character of Hume's enterprise gives a clue as to which aspect of Newton's thought might shed light on Hume's method. Arguably, there is a deeper *analogy* between his method and that of Newton's other major work, the *Opticks* [1704], namely that of the method of *analysis and synthesis*. And while the method itself has ancient roots and in various forms it was a common currency of early-modern methodological thinking,³⁸ yet the way in which it was put to use by Newton was perceived as original,³⁹ and it became dominant in eighteenth-century British natural philosophy through his *Opticks*.⁴⁰ Hume's above quoted commitment to this method is consonant with Newton's methodological proclamation in Query 31, which I quote at length:

in natural philosophy, the investigation of difficult things by the method of analysis, ought ever to precede the method of composition. This analysis consists in making experiments and observations, and in drawing general conclusions from them by induction, and admitting of no objections against the conclusions, but such as are taken from experiments, or other certain truths. For hypotheses are not to be regarded in experimental philosophy. And although the arguing from experiments and observations by induction be no demonstration of general conclusions; yet it is the best way of arguing which the nature of things admits of, and may be looked upon as so much the stronger, by how much the induction is more general. And if no exception occurs from phenomena, the conclusion may be pronounced generally. But if at any time afterwards any exception shall occur from experiments, it may then begin to be pronounced with such exceptions as occur. By this way of analysis we may proceed from compounds to ingredients, and from motions to the forces producing them; and in general, from effects to their causes, and from particular causes to more general ones, till the argument end in the most general. This is the method of analysis, and the synthesis consists in assuming the causes discovered, and established as principles, and by them explaining the phenomena proceeding from them, and proving the explanations.⁴¹

As Newton himself here points out, he uses this method in the first two books of *Opticks* 'to discover and prove the original differences of rays of light', that is to discover qualitative differences. This is what the method of analysis-synthesis, so understood, can reveal: causes belonging to different kinds. And while Newton applies this method in accounting for natural phenomena, he does not doubt that by doing so 'the bounds of moral philosophy will be also enlarged'.⁴²

Newton seems to follow the same method in the *Principia* too: 'the basic problem of

³⁸ See Jardine, *op. cit.*, 17ff.

³⁹ See Russell McCormmach, *Speculative Truth: Henry Cavendish, Natural Philosophy, and the Rise of Modern Theoretical Science* (Oxford: Oxford University Press 2004) 38.

⁴⁰ See Robert E. Schofield, *Mechanism and Materialism: British Natural Philosophy in an Age of Reason* (Princeton: Princeton University Press 1969) 10. and Deborah A. Redman, *The Rise of Political Economy as a Science: Methodology and the Classical Economists* (Cambridge, Mass.: MIT Press 1997), 107.

⁴¹ Newton, *op. cit.*, 139.

⁴² Newton, *op. cit.*, 140.

philosophy seems to be to discover the forces of nature from the phenomena of motions and then to demonstrate the other phenomena from these forces.⁴³ And while it is true that there he analyses motions into forces, he does so by relying on his ‘inference tickets’, thereby preserving the axiomatic character of his analyses. Besides, his commitment to find forces behind motions prevents his inquiry from being qualitative, i.e. an analysis of compounds into ingredients. His enterprise in the *Principia* is to search for a specific, quantifiable natural kind, i.e. forces, and not qualitatively different components. In the *Opticks* his method is analogical, he proceeds by the observation and comparison of different rays of light with respect to various properties like ‘refrangibility, reflexibility, and colour, and their alternate *fits of easy reflexion and easy transmission*’.⁴⁴ Different ways of analysis-synthesis are thus applied in the two works, with different aims and in different methodological environments, and it is only that of the *Opticks* that can be linked to Hume’s enterprise.

The skeleton of this method is, however, common in both cases and can be summarised as follows:⁴⁵

- 1) Resolution of phenomena into their causal components.
- 2) Investigation into the components’ mutual dependence and interaction.
- 3) Generalisation of the relations so revealed to every similar phenomenon.
- 4) Deployment of the principles thus gained in the explanation and prediction of phenomena.

By contrast, the Cartesian method of analysis is propositional:⁴⁶ inquiry consists in analysing a complex question into simpler ones until intuitive answers can be given. Then comes synthesis in deducing explanations from these clear and distinct insights. Experiment plays only an auxiliary role here, either in helping us to choose how to proceed with our questions, or in checking the empirical adequacy of our answers. This is thus neither an analysis of ‘compounds to ingredients’ nor ‘motions to the forces producing them’, it is neither quantitative nor qualitative, but a predominantly *a priori* analysis of complex propositions into intuitively simpler ones.

Descartes’s method cannot guide qualitative inquiry into the components of human nature, but can be useful in hypothetical-normative constructions, inferring from the intuitively accessible properties of human beings their desirable, rightful, necessary etc. social circumstances. Therefore it is hardly surprising that Hume does not follow the Cartesian way, but his comparative analysis and analogical reasoning fits rather well into the Newtonian framework: ‘experiments’ should be ‘judiciously collected and compar’d’ (*THN* 6), and the principles underlying them should be revealed ‘from the observation of several parallel instances’ (*EHU*

⁴³ Newton, *op. cit.*, 41.

⁴⁴ Newton, *op. cit.*, 139.

⁴⁵ See Jaakko Hintikka and Unto Remes, *The Method of Analysis* (Dordrecht: D. Reidel 1974) 110.

⁴⁶ See Garber, *op. cit.*, 37.

8.13). Hume's way of using historical and everyday observations is therefore similar to Newton's use of experiment in the *Opticks*.⁴⁷ Instead of collecting hundreds of cases in an inductivist Baconian or Boylean manner, they both proceed by comparing some phenomena, arriving at hypotheses by generalising the findings, in Hume's words: 'What I discover to be true in some instances, I *suppose* to be so in all' (*THN* 2.1.5.1). And these are to be tested by carefully chosen experiments, or against seeming counterexamples, taken from history and everyday life or from a purposively created artificial setting.

This method connects natural and moral philosophy, and establishes them as continuous fields of knowledge in which the nature and extent of knowledge are the same. The difference between moral and natural philosophy consists in the subtlety of phenomena, and not in the methods followed. The difference is thus merely that of complexity and not in the nature of inquiry; the method of the moral and the natural philosopher are the same. This conviction, consonant again with Newton's ideals as expressed in the *Opticks*, emerges clearly in the introduction of Hume's *Treatise*:

the essence of the mind being equally unknown to us with that of external bodies, it must be equally impossible to form any notion of its powers and qualities otherwise than from careful and exact experiments, and the observation of those particular effects, which result from its different circumstances and situations. And tho' we must endeavour to render all our principles as universal as possible, by tracing up our experiments to the utmost, and explaining all effects from the simplest and fewest causes, 'tis still certain we cannot go beyond experience; and any hypothesis, that pretends to discover the ultimate original qualities of human nature, ought at first to be rejected as presumptuous and chimerical. (*THN* Introduction.8)

This passage expresses belief in the methodological continuity of moral and natural philosophy; the emphasis on experiment; the aim to explore underlying causes (analysis) and explaining by them (synthesis); the denunciation of experimentally ungrounded explanatory hypotheses concerning ultimate principles; and the conviction that the capacities of human cognition are limited. All this sounds very Newtonian, but in a sense much closer to the spirit of the *Opticks*, and especially its *Queries*, than to the *Principia*.

What I am suggesting here is not that Hume's method is explicitly modelled on Newton's *Opticks*. I would rather say that it fits well with post-Newtonian methods of natural inquiry that became dominant in Scotland in the first half of the eighteenth century, and it is plausible to think about Hume's method as being part of this strand of thought. For example, Hume's method is quite similar to the methodological *credo* followed by William Cullen, a prominent member of the Scottish intellectual establishment and Hume's friend and physician, in his

⁴⁷ See Hintikka and Remes, *op. cit.*, 106ff. and Redman, *op. cit.*, 171ff.

influential chemical investigations. Cullen distinguishes between two kinds of analysis.⁴⁸ Analysis into *integrant parts*, i.e. a quantitative analysis into mereological proper parts, is the business of the mechanical philosopher, who studies substances as aggregates composed of homogeneous ingredients. Analysis into *constituent parts*, however, studies substances as mixtures, as being composed of qualitatively different components whose combination results in qualitatively different substances. The proper domain of this latter kind of analysis is thought to be the range of phenomena in which the mechanical approach cannot yield an explanation. And this is the analysis that gives the methodological key both to eighteenth-century philosophical chemistry in Scotland, and to Hume's method of studying human nature as well.

V. Hume's Qualitative Project in Context

I think the overall lesson is clear. The inquiry Hume pursues is primarily *qualitative*: it provides a way of identifying the causal components contributing to the production of human phenomena, by outlining 'the accurate anatomy of human nature' (*THN* 1.4.7.23). As it were, Hume offers a chemical analysis of compound human nature into its ingredients. These are identified as principles with distinctive causal contribution, and human phenomena are considered to be the result of their dynamic interaction. They provide the universal *structure* of human nature in terms of its *functional* components characterised by their self-activity, by the distinctive way they operate on ideas and impression. It is thus more than a mere figure of speech when Hume says he explores the anatomy of human nature – it is a central and constitutive metaphor of his entire project.⁴⁹

The analysis of human phenomena results in various motives of human behaviour and internal functioning, which are then subsumed under a variety of principles ascribed to faculties of the mind – like that of sympathy, imagination, reason etc. The interaction of these principles are frequently envisaged as the interaction of qualitatively different principles, 'as in certain chemical preparations, where the mixture of two clear and transparent liquids produces a third, which is opaque and colour'd' (*THN* 2.3.10.9). Rarely are they seen as qualitatively uniform Newtonian external forces, an artificial kind with specific direction and quantity. The Humean science of human nature consists in the separation and identification of these principles and the examination of their interactions – in qualitative investigations that is, for which the method of analysis and synthesis is the ideal framework.

With his qualitative project Hume does not stand alone on the eighteenth-century intellectual

⁴⁸ See A.L. Donovan, *Philosophical Chemistry in the Scottish Enlightenment: The Doctrines and Discoveries of William Cullen and Joseph Black* (Edinburgh: Edinburgh University Press 1975) 96ff.

⁴⁹ See also *THN* 3.3.6.6 and *Letters of David Hume, op. cit.*, 32f.

landscape. As Robert Schofield points out, an important transformation in British intellectual climate took place around 1740, marking, among other developments, the emergence of a materialistic-vitalistic tendency in natural inquiry, gradually replacing the Newtonian dynamic mechanism. As a result, a new style of inquiry and explanation became common: 'the mathematical analysis of motions to find forces' gave way to the exploration of 'different qualities from experimentally observed characteristics'.⁵⁰ The new style of explanation proceeded in terms of qualitatively different substances, instead of explaining phenomena in a mechanist way, in terms of the interaction of qualitatively homogenous particles. Newton's aetherial speculations helped re-establish active principles as means of explanation, and weakened the mechanist orthodoxy of inertia being an essential property of matter. This process had been initiated by the *Opticks*, and especially its *Queries*, and it had a very strong presence at Scottish universities throughout the century. Representatives of it include William Cullen, Joseph Black, James Hutton, and John Gregory.⁵¹

These tendencies toward new styles of explanation and inquiry were not peculiarly British phenomena. Discontent with mechanical philosophies of nature was widespread in eighteenth-century Europe, particularly in France and Germany. As Peter Hanns Reill shows, there was a vitalistic movement in the Enlightenment which responded to problems, particularly those of living matter, that mathematized mechanical theories could not solve. This led to a revival of natural history, most importantly represented by Buffon – and in the domain of moral phenomena, by the Scottish Enlightenment. Its methods were not based on mathematics, but 'on the principles of comparison, resemblance, affinity, analogical reasoning'; its explanations in terms of 'inner, active forces as central agents in nature' replaced the mechanists' view of external forces acting on inert matter.⁵² It is important to note, however, that despite the emphasis on Baconian roots, natural history now aspired to more than Bacon had originally envisaged. It aimed not only at collecting, describing and classifying phenomena for future philosophical processing, but made instant explanatory use of the insights gained by historical methods. The methods of natural philosophy and natural history started to merge here.

This is the context, I believe, within which sense can be made of Hume's method. Recently, Andrew Cunningham suggested that a vitalistic outlook is characteristic of Hume's theory of the mind whose essential feature is self-activity.⁵³ I think it is fundamentally on the right track and is in accordance with Hume's experimental method: it is qualitatively oriented, and as such it is ideal

⁵⁰ Schofield, *op. cit.*, 95.

⁵¹ See Schofield, *op. cit.*, 10f and 91ff.

⁵² Reill, *op. cit.*, 69, see also Wood, *op. cit.*

⁵³ Andrew Cunningham, 'Hume's Vitalism and Its Implications.' *British Journal for the History of Philosophy* 15 (2007): 59-73.

for revealing the distinctive contribution various faculties make. They exert *active* influence by transforming the passive material of impressions and ideas: sympathy turns ideas into impressions thus enabling us to feel what others feel (*THN* 2.1.11.3); upon experiencing one event regularly following another habit provides us with a secondary impression as the basis of our idea of necessary connection (*THN* 1.3.14.16ff), and so on. Human nature is composed of functional components characterised by their active contribution in terms of predominantly non-mechanical principles. The science of man is the enterprise of charting them and their interactions.

However, one should not overlook Hume's occasional inclinations towards mechanistic explanations that, despite the general vitalistic thrust, are still very much present. This mechanistic outlook shows up in the discussion of the principles of association which Hume describes as forces of attraction (*THN* 1.1.4.6). The mechanistic-vitalistic Janus face of Hume's account sometimes manifests itself clearly:

Ideas never admit of a total union, but are endow'd with a kind of impenetrability, by which they exclude each other, and are capable of forming a compound by their conjunction, not by their mixture. On the other hand, impressions and passions are susceptible of an entire union; and like colours, may be blended so perfectly together, that each of them may lose itself, and contribute only to vary that uniform impression, which arises from the whole. (*THN* 2.2.6.1)

Here it seems that ideas are subject to the dynamic-mechanical principles of association, but impressions and passions seem to interact more like chemical elements. Elsewhere he talks about the 'impulses or directions' of certain impressions or passions (*THN* 2.2.9.2), which seem to be more of a mechanistic outlook on impressions; and also about the product of sympathy as 'an idea converted into an impression' (*THN* 2.2.9.13), which sounds more like a chemical transformation. Similar passages indicate that the question of vitalism contra mechanism is not unequivocally settled in Hume. The general picture seems to be this: his project and method are qualitative and vitalistic, but his inquiry reveals certain components of human nature whose functioning are best explained in mechanistic ways.

Trying to combine the two styles is not unique in the period. One could argue that Hume – like Bryan Robinson, who made an important contribution to the acceptance of the aether hypothesis among eighteenth-century experimental philosophers – combined corpuscular and aethereal explanations, possibly even without noticing their difference.⁵⁴ It is more probable, however, that Hume's strategy, like that of Buffon and Cullen, is to retain those aspects of the mechanical approach that can be fitted with an overall vitalistic framework.⁵⁵ He does not reject mechanism altogether, but speaks a chemical and vitalistic language when it serves his purposes

⁵⁴ See Schofield, *op. cit.*, 109.

⁵⁵ See Reill, *op. cit.*, 67ff and Donovan, *op. cit.*, 96f.

better, or when he cannot do otherwise. And in general it seems that for Hume the language of qualitatively different active principles suits for an account of human nature much better than the language of external forces acting on inherently inert homogenous matter.⁵⁶

⁵⁶ I am indebted for helpful comments and discussion to David Bloor, Márta Fehér, Giora Hon, Brad Hume, Ruth Lorand, Gábor Palló, Jeff Schwegman, Thomas Sturm, Gábor Zemlén and an anonymous referee of the Journal.

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