

existent historical category. One simply needs to distinguish within the textual body of any particular mechanist's system a level or dimension of declaratory or self-glossing discourse, where the system purports to gloss itself--sum itself up for presentation to audiences. Such glossing need not have been consistent with, or even an 'adequate' representation of, the nuts and bolts of the system of which it is a part. At this level most mechanical philosophies will declare themselves opposed to magic, alchemy and the claims of 'spirit', quite independently of where and when some concessions need to be made elsewhere in the discourse. Cartesianism is a nice negative example. Completely mechanist and anti-spirit at the declaratory level, Cartesianism harbours that curious 'first matter' which Descartes insists behaves fully mechanically, but which easily might be taken to have non-mechanical capabilities. In an English context, a hypothetical 'Descartes' himself might have seen fit to have pointed this out, whilst still insisting at the declaratory level on the fully mechanical character of his natural philosophy.

13. Moreover, Bachelard's model of science had two other major implications for the history and social studies of science that have only recently begun to be realized: (1) that all set piece method discourses are necessarily ineffective in the terms they proclaim for themselves (Schuster & Yeo, 1986; Richards & Schuster, 1989); and (2) that if science is 'phenomeno-technical', its analogies to and relations with technology may be richer, more subtle and nuanced than existing models of science and technology suppose (Latour, 1987).

14. It is interesting to place these observations in the context of Pinch's (1986b) illuminating analysis of 'externality of observation' in highly black boxed modern instrumental complexes. Experimental natural philosophers were often in a position analogous to those who, in Pinch's account of the 'solar neutrino telescope', would only be willing or able to acknowledge observation of a 'spodge on a graph'; that is, the first 'thing' in the negotiable chain of possible 'things' made observable by the device. Having no hardwares black-boxed, early experimental natural philosophers were attempting to make manifest in their hardwares immediately perceivable 'objects' or properties of objects. The objects and properties were discursively realized and embodied in natural philosophical talk, and correspondingly the hardwares were problematical in themselves as objects--what they did and what they manifested (as said and thought in natural philosophical terms). Another interesting contrast between studying modern experiment and experimental natural philosophy is that even Pinch, who attends closely to levels of hardware embodiment (and debates about them) and to the historical development of such embodiments, is actually more concerned to analyze levels of argument than levels of hardware embodied meaning.

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