
Referring to the Whig Party, the former political opponents of the Tories in Great Britain, British historian Herbert Butterfield once coined the term ‘Whiggish’ historiography for any account that looks at the past from the perspective of the present, as if the goal of the past were the achievement of the present. Thus, a ‘Whiggish’ history of science carefully ignores everything of the past that does not suit the idea of a steady growth of science towards the current state. Strangely enough, that approach has been prominent in philosophy too, from Hegel to recent philosophy science, so that we could equally speak of ‘Hegelian historiography’.

Because alchemy was driven by the belief in the transmutation of our elements, it does not go well with the Whiggish historiography (and philosophy) of science. In this view, the laboratory work of the alchemists was neither experimental, because they did not measure anything unlike their contemporary astronomers, nor scientific, because they were not seeking for mathematical theories unlike math teachers such as Galilei, nor technological, because they were unsuccessful quacks and impostors. So, you better forget about this wrong track in the otherwise glorious history of science, even if the track lasted for almost two thousand years. At best, their unscientific, cryptic, and contradictory attitudes might qualify alchemists as bedfellows of the fine arts, as an inspirational source for mystic, anti-scientific movements. Modern science, on the other hand, as epitomized, for instance, by the latest nanotechnology, is now on the brink of making the illusionary dreams of the alchemists become real: wealth, longevity, and even the laboratory creation of life. While such a view flatters and satisfies the modern ego, it does everything to misunderstand science and its role in society and lets the propagators of science and technology run again and again into the same old societal troubles.

To be sure, all historians of alchemy have argued against such Whiggish suppression of major parts of the history of science, have pointed out that the history of alchemy is essential to understanding our (past and present) culture. However, *Promethean Ambitions* is by far the strongest account, because it links the history of alchemy to contemporary debates in philosophy and bioethics. Newman has not written another history of alchemy, but a history of the debate on alchemy that analyses the arguments pro and con and their philosophical, theological, and moral underpinnings. More precisely, *Promethean Ambitions* is a history of the debate on the relationship between technology and nature, i.e. on the ethical and practical limits of science and technology, in short the ‘art-nature debate’, from late antiquity to the 17th century. Newman’s main thesis is that throughout that debate alchemy figured as the main cause. One of his implicit theses is that the numerous attempts by philosophers to study the ethical limits of technology from a historical perspective have missed the main point, because they all, of course, carefully disregarded alchemy.

Newman narrates the history of the art-nature debate with focus on four main issues: on how alchemy became the model case in that debate (chap. 2); on the competition between alchemy and the fine arts (chap. 3); on alchemy’s Promethean ambition to create human beings (chap. 4); and on the development of the experimental method (chap. 5).

Among all the ancient and medieval arts and technologies, alchemy made the most ambitious claim that it could not only superficially imitate but also literal-
ly create and replicate natural things and transmute natural species. The most influential Islamic physician Avicenna harshly rejected the alchemical claim on religious grounds, arguing that such capacities were reserved for the Almighty God. Newman shows how Avicenna’s thesis, and thereby the case of alchemy, moved to the fore of Christian medieval debates on the power of demons and witches. Since the power of demons (and witches) was conceived as largely limited to the power of human technologies plus some trickery, the capacities of alchemy became the benchmark to determine the power of demons. In fact, with his comprehensive knowledge of medieval manuscripts and his philological skills, Newman reconstructs a continuous demonological debate, ranging from Albertus Magnus to early modern witchcraft manuals, in which the limits of technology were discussed on the model of alchemy.

In order to point out their extraordinary capacities to replicate and to perfect nature, alchemists frequently distinguished their art from the merely imitating arts, among which the fine arts figured prominently; and sometimes they did so in quite a polemical way. In three case studies of Renaissance artists (including Leonardo da Vinci), Newman analyses their ambivalent responses to alchemy. On the one hand, they appreciated the practical alchemical achievements, like synthetic pigments and other useful materials. On the other, they saw themselves in competition with alchemists about the status of their art (imitating versus perfecting nature) and about the favor of Maecenas at European courts. Newman argues that artists developed a particular anti-alchemical resentment that was based on neither empirical nor religious grounds, but on rivalry. In one case the rivalry went even so far that the artist (Bernard Palissy) copied and transformed alchemical ideas so as to present his artworks as true replicas and perfection of nature instead of mere imitations. Given the frequently assumed romantic association between the fine arts and alchemy, Newman’s historically informed analysis is particularly refreshing.

His third main topic, the alchemical creation of life and homunculi, has frequently been subject to three misunderstandings, which Newman clarifies: First, the artificial creation of life was never much contested before the mid-19th century, because everybody could observe that primitive organisms spontaneously generated out of putrefying matter; and thus alchemists routinely pointed to spontaneous generation to argue only that the transmutation of natural species such as that of metals is possible. Second, the many alchemical illustrations that included human beings or animals, which flourished since the 15th century, were, of course, allegories of chemical processes. Third, the Jewish tradition of golems and the history of mechanical automata since early antiquity were both disconnected from the alchemical tradition. With these three misunderstandings clarified, Newman has browsed the alchemical literature for claims and recipes of making homunculi. While the number of results is rather meager, their role in the art-nature debate is indeed important. He finds two periods in which such bold claims were made and debated: early Islamic alchemy, from the pseudo-Platonic Book of the Cow to the Jabir corpus, and Paracelsian iatrochemistry. There are interesting parallels: in both cases, the making of homunculi was considered the apex of human technology; its crucial step consisted in the incubation of male semen, which referred to the Aristotelian theory of sexual reproduction; and it was meant to serve the ascetic and eugenic goals of male reproduction and refinement without sexual intercourse. Analyzing the Islamic and Christian responses, Newman argues that they largely prefigured current debates and arguments in bioethics, from ‘playing god’ and demonic involvement to the questionable status of parents and the
issues of human eugenics and organo-
therapy.

I may critically note that for the Para-
celsian period, Newman’s two main
sources are a genuine text by Paracelsus
(De humunculis) and a text of which the
authorship is still debated (De natura re-
rum), which he acknowledges. While his
arguments are convincing with regard to
the latter text, I am not so sure about
the former text. At least I recall that
when I once followed the references to
De humunculis provided by Goethe
scholars in their routine commentaries
on the humunculus figure in Faust II, I
burst into laughter because the text is
essentially a moral treatise on sodomy
rather than a laboratory recipe for the
creation of humunculi. In De natura re-
rum, however, as Newman makes clear,
the ‘belly of the horse’ (venter equinus)
was a technical laboratory term for
keeping the male semen in a closed ves-
nel at a certain temperature.

The forth topic relevant to the art-
nature debate is the question if artificial
interventions into nature in the form of
experiments prevent one from studying
nature per se. Drawing on his earlier pa-
ers on this subject, Newman argues
that the experimental method as a legiti-
mate form to study nature grew out of
alchemy before it was propagated and
refined by Francis Bacon and Robert
Boyle. More important, he shows that,
part from some demonological hot-
heads and inquisitors, there was a favor-
able ground rather than opposition to
the experimental method in the main-
stream Scholastic Aristotelian tradition,
as it was in Aristotle’s genuine writings.

The seed of Promethean Ambitions is
clearly Newman’s seminal paper on
‘Technology and alchemical debate in
the late middle ages’ (Isis, 80 [1989],
423-445) which once inspired me to
study the complimentary side in the his-
tory of the art-nature debate (‘The No-
tion of Nature in Chemistry’, Studies in
History and Philosophy of Science, 34
[2003], 705-736). While I should per-
haps argue that Newman does not dis-
tinguish enough between different con-
cepts of nature in that debate, I can only
admire how his medieval history schol-
arship has grown to place alchemy in the
center of current philosophical and pub-
lic debates. At the same time, the book
is a masterpiece of the philological
method, because the art-nature debate is
the result of a comprehensive and thor-
ough study of numerous texts that are
linked to each other by many indirect
references, which all needed to be philo-
logically established. At times the me-
ticulous analyses required may prevent
general readers from following the main
arguments. However, if they accept the
necessity of such analyses as philological
standard, equivalent to standards of
chemical analysis, say, they will learn
that the Whiggish historiography (and
philosophy) of science has created a
chimera. Newman’s case for a deeper
understanding of alchemy is no less than
a general case for the understanding of
science and technology in society.

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