

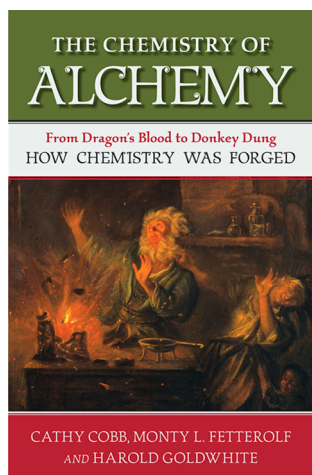
Review of *The Chemistry of Alchemy: From Dragon's Blood to Donkey Dung—How Chemistry Was Forged*

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Chemistry of Alchemy: From Dragon's Blood to Donkey Dung—How Chemistry Was Forged by Cathy Cobb, Monty L. Fetterolf, and Harold Goldwhite. Prometheus Books: Amherst, New York, 2014. 364 pp. ISBN: 978-1616149154 (hardcover). \$24.95.

When I think back to the times when I was a youth contemplating the universe around me, I remember exploring how the materials of the world mixed together or broke down (either over time or with my help). Cobb, Fetterolf, and Goldwhite have captured the exploration of the material world, the benefits of discovering new combinations of materials, and occasionally the downfalls of being discovered in *The Chemistry of Alchemy: From Dragon's Blood to Donkey Dung—How Chemistry Was Forged*. Through this quick read they explore the eras and individuals who broke new ground from the theoretical notions of transmutations to gold to the final scientific "leaps" of Boyle and Lavoisier. Although not exhaustive, the authors do make reference to other regions of alchemical development; nonetheless, most of the conversation is focused on the developed Arab and European civilizations. For those interested in further inquiry into the background of each of the personalities, there are copious references, which left this trained chemist wanting to know more about each and every one.



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Lab bench chemists will have a welcome surprise from *The Chemistry of Alchemy* compared with the typical historical perspective pursued by similar texts. The surprise lies within the demonstrations that follow each chapter. For example, readers can navigate the waters of disappearing ink to their own version of the philosopher's stone. To the untrained eye this is a novelty, but for trained chemists this is a throwback to a few of

the original demonstrations used to summon patronage, or our current version of funding. To this end the authors recommend the necessary equipment, materials, and miscellaneous supplies to complete all the demonstrations provided. General safety precautions are discussed in a brief yet thorough conversation and then reiterated within the demonstration procedure.

Part 1 literally sets the scene for the conversation near 300 CE. The conversation starts quite similarly to a research project, determining where the gaps are and beginning to accrue some knowledge of the subject at hand with the possibility of filling in those gaps of knowledge and extending the research and experimentation further. This section ends with a theoretical conversation alluding to the fact that alchemical practices were being explored around the globe, in some cases practically with hands-on expertise, and also through writings of alchemical practices that contemplated the production the philosopher's stone.

Part 2 provides the backdrop for growth in the budding field of alchemy in the Middle Ages. This section takes readers through the trials and tribulations of securing patronage. The first interactions of religion are discussed, as well as the study of nature, which paves the way for the true highlight of the alchemical era.

Part 3 discusses all the practice that has been attempted and begins to compile that knowledge into a single set of skills. Individual personalities finally give way to practical studies, such as pottery, perfuming, pigments, fertilizers, metallurgy, and the understanding of the refining of ores. Because of the financial opportunities that become available with this type of knowledge, *The Chemistry of Alchemy* explores the troubled side of science: passing others' ideas off as one's own, and all-out alchemical fraud.

Part 4 concludes with what we as practicing chemists would call the age of understanding. The refinement of saltpeter and gunpowder is determined along with the quest for a truly controlled reaction. Isolation of the purest form of reactionary compounds, such as oxygen, was the goal and though alchemists came close to isolation with ingenious apparatus, they were just one or two steps away from true isolation and containment. Thus, was the quest of the alchemists and the true distinction between alchemy and chemistry.

Overall this text is a welcome refresher from the typical academic minutia for this chemist. The authors' writing style is manageable for the untrained chemist or alchemist in us all. When a deeper explanation is needed for a particular technique or common chemical term, the authors' descriptions are accurate and concise. *The Chemistry of Alchemy: From Dragon's Blood to Donkey Dung—How Chemistry Was Forged* served as a

good winter-break read that provided some foundational knowledge of the field sometimes left behind when the conversation turns to true science. But let's face it, we all still want to imagine that the improbable is possible, otherwise we would leave the bench forever, never to run another reaction or ask the question: "What if?"

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Notes

The authors declare no competing financial interest.