Kemins historia

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This is a Swedish translation of 'A Short History of Chemistry' which was a commissioned work for 'Science Study Series' dedicated to provide popular books on science at the high-school level. As such it is part of the cheap Prisma paper-backs which were published in the 60's and which I bought and read in my teens. Not all of them, as I recall I must never have read this particular book.

Not much can be said about it other than it gives a clear and concise survey of the history of chemistry, culminating in the discovery of atoms, in the sense of almost integers turning up. He does not really go beyond what was taught in school so the general framework is clear and does not have to be learned. For all his science fiction jazz Asimov was an academic bio-chemist, so the subject matter must have been congenial to him.

But if you feel compelled to write something what should you write? Chemistry goes back some way in practice if not in understanding. Metallurgy being an obvious example. How to make bronze in the right proportions, how to make iron out of the available ore. Obviously there was plenty of undocumented trial and error over centuries. The Greeks of course made some contributions, but not any real practical ones, more in the matter of the level of paradigms. The four basic elements is one example and the idea that by nmixing them an alomst inexhaustible variety of matter could be formed, another example is atomic theory, which at the times of the Greek was purely speculative, yet both ideas turned out to be quite fruitful. Alchemy is the medieval phase, and what is noticeable is how little progress it made. The purpose was clear and the motivation great and the efforts made admirable, but still nothing came out of it. You need clever ideas otherwise you get nowhere. Entirely wasted, however, were not their efforts, much of the techniques and implements chemists came to use in the future were actually developed by the alchemists. Chemistry as a science started with quantification, as did dynamics and mechanics. Boyles law is a shining example. It lead to the realization that chemical reactions preserve masses, a simple but fundamental principle. Much advance was made as to gases, and new gases such as hydrogen and oxygen were discovered. Then came the first crisis, namely the nature of heat and the imagined phlogiston and negative masses. Eventually it got its satisfactory explanation by Lavoisier, one of the proponents as well as victims of the French Revolution, through his idea of oxidation.

The beginning of the 19th century constituted a revolution in chemistry and later on a remarkable expansion of its applications. It was not until the 19th century really that science started to have a palpable impact on common life, and most of that impact was due to chemistry. It was with Proust, Dalton and Avogrado that atomic theory left its speculative state and took off ground. Vitalism was discredited, there is but one kind of matter, which was philosophically a major break through. The major apllicable advances was in organic chemistry and the realization that the 3-dimensional structures of molecules were in fact crucial in terms of their chemical properties, proportions of basic elements was not enough. The periodic system introduced a sense of order allowing missisng elements to be identified and their chemical properties predicted. It also lead to the modern atomic theory of different shells of electrons, which explain the chemistry of atoms in which the atomic nucleus plays a very marginal rôle. In fact this is when chemistry and physics start to intersect and truly intermingle on the arena of matter, previously the territory of chemistry proper. We from now on speak about physical chemistry. It all ends (including the book) with nuclear chemistry, which does not really have that much to do with chemistry at all.

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