

for Egypt was Chemia, and that the name was given to it on account of the black color of its soil. The same word designates the black of the eye as the symbol of the dark and mysterious. It is therefore pretty certain that chemistry originally meant Egyptian or secret knowledge, as it was afterwards termed the secret or black art.

The name of the first chemist, which we have on the records of history, was Hermes, but of him we have no very definite knowledge, as the records of his times are very unreliable.

I may say here that the Chinese claim to have been the first to have engaged in chemistry, and although we are not altogether in a position to deny this, still the very ancient dates, to which they lay claim, are open to criticism. We also know that a certain knowledge of chemistry and metallurgy must have been known at a very early period in the valley of the Ganges in India, as they have metallurgical works there which existed beyond any present history, and which would vie in magnitude with any we could show to-day, so that in giving a history of the art we must always bear in mind that we do it from our western standpoint.

From Egypt the knowledge of this new art and mystery was carried into Arabia. Here a celebrated person named Geber, a physician, paid great attention to it. The works of Geber, the most celebrated of Arabian Alchemists, are handed down to us through Latin translations. In these books, which may with truth be considered to be the oldest chemical writings, we learn that the aim of the science of which Geber treats was the transmutation of the base into the nobler metals. He describes many chemical operations, such as filtration, distillation, crystallization, and sublimation, and by these he prepared new substances or purifies the old ones. Bodies such as alum, green vitrol, saltpetre and sal-ammoniac are employed and we find he was able to prepare nitric acid or aqua fortis and from it the valuable solvent for gold, aqua regia.

It is probable that even sulphuric acid was known to Geber, and certainly a number of metallic compounds, amongst which were Mercuric oxide and corrosive sublimate, the preparation of which, he describes, were well known.

Geber was the first propounder of a chemical theory. He asserts that the differences between the metals are due to the preponderance of one or two principals, mercury and sulphur of which all the metals are composed.

The first principle is characteristic of the truly metallic qualities, whilst the latter causes the peculiar changes noticed when the metals are exposed to heat.

The noble metals were supposed to contain a very pure mercury and are therefore unalterable by heat, whilst the base metals contain so much sulphur that they lose their metallic qualities in the fire.

These constituents may, however, not only be present in different proportions, but also in different degrees of purity or in different states of division, and thus it might naturally be supposed that if not by a variation in their relation, at any rate by a change in their condition, such an alteration in the properties of one metal may be brought about as would produce from it some other known metal.

Thus, gold and silver contain a very pure mercury, which in the one instance is combined with a red and in the other with a white sulphur; and he explains the fact that these two metals amalgamate so easily, because they already contain a large quantity of mercury and are therefore quickly attracted by the liquid metal.

In China it appears certain that there was, at an early period, some knowledge of chemistry, for we find that the Chinese were well acquainted with many chemical processes and several metals, such as gold, silver, mercury,

lead, copper, iron and zinc, besides several salts, chemicals, and medicinal preparations.

In Egypt, also, the arts of working in metals, of manufacturing soap, and, more singular still, of manufacturing glass of the most beautiful description, were practiced, in all probability, even before philosophers in that ancient country caught a glimpse of the beautiful science, which was intimately connected with these processes.

Nevertheless, the mere knowledge of the right employment of the different substances used in these arts was a kind of chemistry, though not an enlightened one, it was the chemistry of experience.

It is very surprising to find how successful the Egyptians were in these arts, notwithstanding their deep ignorance of the laws of the science.

Some of the colors employed by the Chinese for their porcelain, and some of the dyes, cannot be equalled even in our day, when so much is known about the principles and practice of chemistry.

The Egyptians, before the exodus of the children of Israel, were well acquainted with the means of coloring glass in the most exquisite manner, so that they used to make artificial gems, such as the amethyst, of glass, which could not be distinguished from the stone itself. The Egyptians appear also to have prepared sal-ammoniac, soda, common salt, several metals and metallic alloys, soap, vinegar, various medicines and pigments; they seem also to have had some acquaintance with the use of mordants in fixing dye colors.

We are assured of the fact that they knew how to blow glass in the same manner as we do, and thus they may have formed useful chemical vessels for the early professors of this art. So far had the glass workers of Egypt advanced in their art, that even coffins were sometimes made of glass.

The knowledge of chemistry came at length into Europe during the domination of the Moors in Spain. Science of all kinds was much encouraged, and the arts and learning flourished luxuriantly.

An immense library of books upon every subject existed at Cordova, whither the learned of Europe flocked, and where, in all probability, they first became acquainted with the writings of the Arabian chemists; the knowledge they there obtained being afterwards communicated by them to others on their returning home.

The Crusaders, also, on their return from the Holy Land, are said to have brought the knowledge of chemistry into Spain, whence it spread into Germany, France and England.

As I mentioned before, one of the chief subjects studied by the earlier chemists, or alchemists (all being derived from the Arabic meaning "the," and used in the modern word "alkali") was the transmutation of metals, or, in other words, the converting of the baser metals into gold, this they hoped to do by the aid of a substance to be discovered, viz., the philosopher's stone. And, according to some of their accounts they were successful, but of these cases some, no doubt, were actual attempts to deceive, and in others the experimenters were themselves deceived.

We have here a solution of copper sulphate, and I will now introduce into it a clean knife-blade. You will notice that it is at once covered with a red colored substance, this is copper which has been transferred from the solution to the knife blade. This experiment will show what might have been a case of self deception, and when gold might have been supposed to have been formed in the same way.

A second object of search was for the elixir of life, which was to prolong life indefinitely, and the third object was the alchist, or universal solvent.