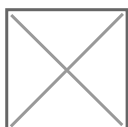


27 What Jabir Said

Okay, I know it's hard to read so much. Here's the short version, as told by me:

Mercury-Sulfur Theory

Plato described the four elements in pairs, Fire/Earth and Air/Water. Aristotle changed the opposing pairs to Dry/Wet and Hot/Cold properties.



Now, draw a line from Wet to Dry. Wet is mercury (*argent vive*, quicksilver) and Dry is sulfur. On that line is where you find all the metals. At the very center of the diagram is the most perfect substance, gold. The alchemist has one thing to do: start with some metal, and find out where it is on the line, and then create the *al-iksir*, a substance that, when combined with the metal, brings it back to perfect balance, and thus become gold.

How do you find out where your metal is on that line? Numerology. Take the letters in "iron" and turn them into numbers (any way you want, it doesn't matter how) which express how much sulfur and how much mercury is there. Iron is harder than gold, so it probably has more sulfur than mercury. Calculate the difference to get to 50/50, and make a sample of that material. Mix that material with iron, heat it up, and presto, gold!

Oh, it didn't work? Did you really have the philosopher's stone, or did you fake something up quickly.

“ In the Jabirian corpus, these qualities came to be called "natures" (*ṭabā'ī*'), and elements are said to be composed of these 'natures', plus an underlying "substance" (*jawhar*). In metals two of these 'natures' were interior and two were exterior. For example, lead was cold and dry and gold was hot and moist. Thus, Jabir theorized, by rearranging the natures of one metal, a different metal would result. Like [Zosimos](#), Jabir believed this would require a catalyst, an *al-iksir*, the elusive elixir that would make this transformation possible – which in European alchemy became known as the [philosopher's stone](#).

Wikipedia: Jabir ibn Hayyan

The mercury-sulfur theory is a pretty direct descendent from Aristotle's *Meteorology* as Aristotle describes the actions of sulfur and mercury in the subterranean generation of metals.

Procedures

The methods and steps of alchemy were defined in Alexandria. Jabir makes it clear what those steps and processes really are, so you can't get it wrong.

Furnaces

Jabir is the first to identify that a furnace can have different temperatures. He called the "degrees" of heat, and there aren't very many of them. First degree heat is the coolest, then second degree heat which is about three times as hot, then third degree heat, which is five times as hot, then fourth degree heat, eight times as hot. Why 1, 3, 5, 8? Numerology!

4	9	2
3	5	7
8	1	6

In this magic square, all rows, columns, and diagonals add to 14. The bolded digits add to 28, and the remaining digits are 1, 3, 5 and 8. Jabir says all things in the world are governed by the number 17, the sum of 1+3+5+8.

“ One way in which Jabir used these numbers was in the application of alphabetical numerology to elucidate the constitution of the metals. Each of the four elementary qualities or ‘natures’ was supposed by him to have four degrees and seven subdivisions, giving a total of 28×4 , i.e., 112, ‘positions’. The letters of the Arabic alphabet, 28 in all, were assigned to the subdivisions of heat, coldness, dryness, and humidity, and the scheme was extended to the values of the four degrees according to the series 1, 3, 5, 8. The degrees and subdivisions were equated to weights on the Arabic system of 2 qirats = 1 danaq, 6 danaqs = 1 dirham, and a table was constructed in which, for example, the letter b denoted, in the second degree of coldness, a weight of $3 \frac{1}{2}$ dirhams; in the fourth degree b corresponded to a weight of $9 \frac{1}{2}$ dirhams. The remaining letters were similarly calibrated.

It was mentioned earlier that Jabir distinguished between the external and the internal composition of a metal. One reason for this distinction can be found in the figures just elicited. Metals are composed of heat, coldness, dryness, and humidity, but there is a limiting condition: opposing ‘natures’ are in the ratio of either 1 : 3 or 5 : 8 or vice versa. The figures for lead, however, do not agree with these ratios, and the difficulty is even greater with *fidda*, silver, when analysed in the same way — it proves to consist merely of heat and coldness in equal proportions. Jabir was therefore forced to use a further hypothesis, namely that the analysis reveals only the peripheral constitution; the balance must be restored by the constitution of the interior. Hence for silver the total

composition, external and internal together, must be arrived at by calculation.

The transmutation of one metal into another is thus an adjustment of the ratio of the manifest and latent constitutions of the first to those of the second, an adjustment to be brought about by an elixir. According to Jabir there are various elixirs suitable for specific transmutations, but transmutations of every kind can be brought about by a grand or master elixir. This grand elixir was itself of two grades, differing only in power, a point illustrated by the story related by an alchemist called Dubais ibn Malik and published by Stapleton. Dubais said,

"I was living at Antioch, where I had settled, and there I had a friend who was a jeweller by profession, to whose shop I often resorted. Now, as we were talking together one day, a man came in, and, having saluted, took his seat. After a while he removed from his arm an armlet which he handed to my friend. It was set with four jewels, and an amulet of red gold was fitted into it. On the amulet was inlaid a clear inscription in green emerald, which read as follows: Al-Hakim bi-amrillah puts his trust in God [Al-Hakim bi-amrillah was ruler of Egypt 996-1020]. I was astounded at the fineness of the jewels, the like of which I had never before seen, nor had I ever thought to see the like in the world, and it occurred to me that this amulet must have been stolen from the treasury of Al-Hakim, or it might have fallen from his arm, and this man had picked it up, since such jewels are to be found only in the treasuries of kings, or among their heirlooms."

It was finally purchased by Dubais for 3000 dinars. Inside the amulet was found a manuscript, pronounced by Dubais, who was acquainted with the shaky handwriting of Al-Hakim, to be in the holograph of that king, containing an account of two ways of making the Red Elixir, according to the method of Moses and the rest of the Prophets as handed down by the Imam Ja'far al-Sadiq. Dubais was successful in carrying out the operations, both of the Lesser Way, whereby an Elixir was made capable of converting 500 times its own weight of base metal into gold, and of the Greater Way, whereby an Elixir was prepared of which only one dirham was required for the conversion of 3000 dirhams of base metal.

Holmyard, E. J. *Alchemy* (Dover Books on Engineering) (p. 77-79). Dover Publications. Kindle Edition.

Balance

There is an idea which comes out of Arabic mathematics, balance. It's not well-defined by Jabir, but later Arabic mathematicians do a good job describing the balance of expressions, like $\frac{1}{3}$ and $\frac{2}{6}$ having the same balance. Later, in the 1400's Descartes reads the Arabic writers on balance and creates algebra. Jabir is one of the earliest expressors of the idea of balance.

In Jabir's *ʿilm al-mīzān*, The Secrets of the Balance, he attempts to reduce all observations of matter to measurements and proportions. This attempt at empiricism (the idea that the only truths we know are observed directly and measurable) did not catch on.

Organic Synthesis

Jabir describes the first example of making a substance thought to be made only by organisms using lab techniques. The substance in question is ammonium chloride, *sal ammoniac*. This will remain the only organic synthesis until the 1800's when urea is made in the lab.

Inorganic Synthesis

Jabir is the first to describe the manufacture of nitric acid, the blue-green colors of copper in a flame, the use of manganese oxide in glassmaking, the preparation of steel, dyeing of cloth and leather mordanting with alum (which probably had been known for a millenium, but never described in writing), and the use of varnish to protect both cloth from water and metal from rusting.

Revision #1

Created 3 October 2023 09:10:20 by bruce

Updated 30 October 2024 13:05:06 by bruce