

58 Isaac Newton

Isaac Newton was an alchemist. In terms of years of work, he was far more an alchemist than a physicist or mathematician.

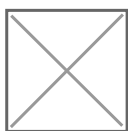
While at Cambridge University there was an outbreak of the plague. Newton went home for a year, his *Annus Mirabilis* (Year of Wonders, 1666) where he worked out calculus, the operation of the prism, the laws of motion, and universal gravity. After he wrote these up in *Principia Mathematica* (the 'c' is hard, as in all Latin), "The Mathematical Principles of Natural Philosophy," he began his study of alchemy, theology, church history and prophecy.

About that year Newton applied himself to a cure for the plague: "the best is a toad suspended by the legs in a chimney for three days, which at last vomited up earth with various insects in it, on to a dish of yellow wax, and shortly after died. Combining powdered toad with the excretions and serum made into lozenges and worn about the affected area drove away the contagion and drew out the poison." This was in Newton's analysis of the alchemist van Helmont's book, *de Peste*.

In 1727 Humphrey Newton wrote:

“ About 6 weeks at spring, and 6 at the fall, the fire in the elaboratory scarcely went out, which was well furnished with chemical materials as bodies, receivers, heads, crucibles, etc., which was made very little use of, the crucibles excepted, in which he fused his metals; he would sometimes, tho' very seldom, look into an old mouldy book which lay in his elaboratory, I think it was titled *Agricola de Metallis*, the transmuting of metals being his chief design; . . . His brick furnaces, *pro re nata*, he made and altered himself without troubling a bricklayer. [Quoted in Betty Jo Dobbs, *Foundations* 8.]

Even while the President of the Royal Society he practiced his alchemy in secret.



This is his *Clavis*, or Key to his interpretation of the *Emerald Tablet* of Hermes Trismegistus.

“ *The Key*

[f. 1r] First of all know antimony to be a crude and immature mineral having in itself materially what is uniquely metallic, even though otherwise it is a crude and indigested mineral. Moreover, it is truly digested by the sulfur that is found in iron and never elsewhere.

Two parts of antimony [combined] with iron give a regulus which in its fourth fusion exhibits a star; by this sign you may know that the soul of the iron has been made totally volatile by the virtue of the antimony. If this stellate regulus is melted with gold or silver by an ash heat in an earthen pot, the whole regulus is evaporated, which is a mystery. Also, if this regulus is amalgamated with common mercury and is digested in a sealed vessel on a slow fire for a short time – two or three hours – and then ground for 1/8 of an hour in a mortar without moisture while being warmed moderately, until it spits out its blackness, then it may be washed to deposit the greatest part of its blackness, until the water, which in the beginning becomes quite black, is scarcely more tinged by the blackness. This can be done by flushing it with water many times. Let the amalgam be dried, again placed near the fire, and kept in the above-mentioned heat for three hours. Afterwards let it be ground again as before in a dry and warm mortar. It pushes out new blackness, which must be washed away again; this must be repeated continually until the whole amalgam becomes like shining and cupellated silver, whereas at first it had a dark leaden color.

Then distill this mercury which has been so washed and amalgamate over again seven or nine times, and in each amalgamation see to the heating, grinding, and washing as many times as before, Distill the whole as before. On the seventh time you will have a mercury dissolving all metals, particularly gold. I know whereof I write, for I have in the fire manifold glasses with gold and this mercury. They grow in these glasses in the form of a tree, and by a continued circulation the trees are dissolved again with the work into new mercury. I have such a vessel in the fire with gold thus dissolved, where the gold was visibly not dissolved by a corrosive into atoms, but extrinsically and intrinsically into a mercury as living and mobile as any mercury found in the world. For it makes gold begin to swell, to be swollen, and to putrefy, and to spring forth into sprouts and branches, changing colors daily, the appearances of which fascinate me every day. I reckon this a great secret in Alchemy, and I judge it is not rightly to be sought from artists who have too much wisdom to decide that common mercury ought to be attacked through reiterated cohobation by the regulus of leo [that is, of iron or antimony]. That unique body, that regulus, however, is familial with mercury seeing that it is closest to that mercury you have known and recognized in the whole mineral kingdom, and hence most closely related to [f. 1v] gold. And this is the philosophical method of meliorating nature in nature, consanguinity in consanguinity.

With regard to this operation, look at the Letter responding to Thomas of Bologna, and you will find this question fully solved.

Another secret is that you need the mediation of the virgin Diana [quintessence, most pure silver]; otherwise the mercury and the regulus are not united.

The regulus is made from antimony four ounces /nine parts/, iron two ounces /four parts/; this is a good proportion. Do not neglect to have a mass of antimony greater than that of iron, for if an error is made here you will be disappointed. Make the regulus by casting in nitre bit by bit; cast in between three and four ounces of nitre so that the matter may flow.

It is not a good idea to prepare in one crucible a greater quantity than the above measure of antimony. The antimony is ground, then cupelled together with iron, whatever others may say or write.

Little nails may be used and especially the ends of those broken from horn shoes. Let the fire be strong so that the matter may flow [like water], which is easily done. When it flows, cast in a spoonful of nitre; and when that nitre has been destroyed by the fire, cast in another. Continue that process until you have cast in three or four ounces. Then pile up the charcoals about the crucible, taking care that they do not fall into it. Increase the fire as much as the fusion of common silver requires, and keep it in that state for 1/8 of an hour. [The matter ought to be like a subtle water if you have labored correctly.] Then pour the matter out into a cone. The regulus will subside. Separate the ashy scoria from it. Keep the cooled material in a dry vessel.

It is a sign of a good fusion if the iron is completely fused and if the scoriae break up by themselves into powder.

Beat the regulus and add to it two, or at most 2½, ounces of nitre. Grind the regulus and the nitre together completely and again melt. Throw away the arsenical and useless scoriae.

Grind the regulus a third and fourth time with at most one ounce of nitre and melt in a new crucible, and on the fourth time you will have scoriae tinged with a golden color and a stellate regulus.

NB In the last three times the scoriae must be thrown away because they are arsenical; however, they are useful in surgery.

NB In the last three fusions the regulus must be beaten, and ground and mixed with nitre. Some cast the nitre into the crucible, but this is not recommended, for, firstly, the fusion is as a result prolonged and the regulus is not without some loss of itself by exhalation. Secondly, nitre thrown in in this way stays on the surface and in time it cools the regulus. And since nitre flows easily, [f. 2r] it may flow at first and encrust so that it will not flow again without a large fire. If that happens, the best part of the regulus perishes in the conflagration, whence

it is that sometimes a star perishes because it is falsely ascribed to a constellation. You will see that the regulus mixed with nitre in this way flows easily with it; and you will not see it become hard in any manner, except for the difference in the depuration, which is far greater if it is mixed than if the nitre is just tossed in.

Take of this regulus one part, of silver two parts, and melt them together until they are like fused metal. Pour out, and you will have a friable mass of the color of lead.

NB If the regulus is joined with the silver, they flow more easily than either one separately and they remain fused as long as lead even though there are thus two parts of silver, which is then changed into the nature of antimony, friable and leaden.

Beat this friable mass, this lead, and cast it together with the mercury of the vulgar into a marble mortar. The mercury should be washed (say ten times) with nitre and distilled vinegar and likewise dried (twice), and the mortar should be constantly heated just so much as you are able to bear the heat of with your fingers. Grind the mercury $\frac{1}{4}$ of an hour with an iron pestle and thus join the mercury, the doves of Diana mediating,⁸ with its brother, philosophical gold, from which it will receive spiritual semen. The spiritual semen is a fire which will purge all the superfluities of the mercury, the fermental virtue intervening. Then take a little beaten sal ammoniac and grind with the mercury. When it is fully amalgamated, add just enough humidity to moisten it, and this one philosophical sign will appear to you: that in the very making of the mercury there is a great stink. Finally, wash your mercury by pouring on water, grinding, decanting, and again pouring on fresh water, until few feces appear.

Newton's Commentary (early 1680s)

“ *The Commentary on the Emerald Tablet*

The things that follow are most true. Inferior and superior, fixed and volatile, sulfur and quicksilver have a similar nature and are one thing, like man and wife. For they differ one from another only by the degree of digestion and maturity. Sulfur is mature quicksilver, and quicksilver is immature sulfur; and on account of this affinity they unite like male and female, and they act on each other, and through that action they are mutually transmuted into each other and procreate a more noble offspring to accomplish the miracles of this one thing. And just as all things were created from one Chaos by the design of one God, so in our art all things, that is the four elements, are born from this one thing, which is our Chaos, by the design of the Artificer and the skillful adaptation of things. And this generation is similar to the human, truly from a father and mother, which

are the Sun and the Moon. And when the Infant is conceived through the coition of these, he is borne continuously in the belly of the wind until the hour of birth, and after birth he is nourished at the breasts of foliated Earth until he grows up. This wind is the bath of the Sun and the Moon, and Mercurius, and the Dragon, and the Fire that succeeds in the third place as the governor of the work; and the earth is the nurse, Latona washed and cleansed, whom the Egyptians assuredly had for the nurse of Diana and Apollo, that is, the white and red tinctures. This is the source of all the perfection of the whole world. The force and efficacy of it is entire and perfect if, through decoction to redness and multiplication and fermentation, it be turned into fixed earth. Thus it ought first to be cleansed by separating the elements sweetly and gradually, without violence, and by making the whole material ascend into heaven through sublimation and then through a reiteration of the sublimation making it descend into earth: by that method it acquires the penetrating force of spirit and the fixed force of body. Thus will you have the glory of the whole world and all obscurities and all need and grief will flee from you. For this thing, when it has through solution and congelation ascended into heaven and descended into earth, becomes the strongest of all things. For it will constrain and coagulate every subtle thing and penetrate and tinge every solid thing. And just as the world was created from dark Chaos through the bringing forth of the light and through the separation of the aery firmament and of the waters from the earth, so our work brings forth the beginning out of black Chaos and its first matter through the separation of the elements and the illumination of matter. Whence arise the marvellous adaptations and arrangements in our work, the mode of which here was adumbrated in the creation of the world. On account of this art Mercurius is called thrice greatest, having three parts of the philosophy of the whole world, since he signifies the Mercury of the philosophers, which is composed from the three strongest substances, and has body, soul, and spirit, and is mineral, vegetable, and animal, and has dominion in the mineral kingdom, the vegetable kingdom, and the animal kingdom.

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