# JACK LINDSAY

# THE ORIGINS OF ALCHEMY IN GRAECO-ROMAN EGYPT

# THE ORIGINS OF ALCHEMY IN ROMAN EGYPT

In this, the first thorough enquiry into the origins of alchemy in Roman Egypt, Jack Lindsay covers the craft techniques and mystery lore of metallurgical industries of the ancient world, allied industries such as dyeing and mining etc., myth and speculation surrounding creation and the nature of the universe, the growth of interest in magnetism, the development in systems of physics among the Stoics, which have reappeared in modern times, and the growth of gnostic and hermetic cults of contact with the spirit-world.

Lindsay describes how all these elements came together as a part of the general culture development of Graeco-Roman society and how the impasse it reached was linked with technological failure and the inability of Greek thought to develop beyond its geometrical basis with allied maths and atomic mechanism. The result is a welcome addition to Lindsay's Roman Egypt series which breaks new ground and presents a valuable survey of a fascinating subject.

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*Jack Lindsay*

# THE ORIGINS OF ALCHEMY IN GRAECO-ROMAN EGYPT

FREDERICK MULLER

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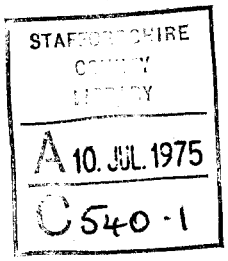


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To
Marie Delcourt-Curvers

*This solid flesh a circling smoke*
*in winds of bellying Time*
*haunts crevices of Space and seems*
*anchored here or there:*
*Men have thought the prospect strange*
*demonic scaring as they woke*
*from a ravishing crystalline dream*
*of abstract Eternities*
*to touch the edges of Change*
*where all Numbers twist and break:*

*yet Pattern lurks in the vanishing lair*
*of ragged particles. Alchemists*
*first kept the double vision and reckoned*
*as aspects of a single Stream*
*the Vortices of spinning mist*
*and the Structure of the unseizable second*
*when Life leaps upwards through the range*
*of fiery unstable Symmetries,*
*intricate dangerous Time.*

*Time*
*is the moving*
*image of Eternity*
*Plato remarked among the Stars.*
*Eternity*
*is the sudden*
*wholeness of Time*
*Apollo answers amid the Flowers.*

J.L.

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# *Author's Note*

This is the fourth book of a series on the life and culture of Roman Egypt. It is, however, complete in itself, though naturally the more one knows of the period the more one is aware of its ways of thought and action, what it comes out of and what it is moving towards, and the richer becomes the background against which one views any particular aspect. The first book dealt with the more ordinary matters of daly life; the second with "leisure and pleasure" and the Dionysiac cult in its later phases; the third with the life on the Nile and the role of that river in Egyptian religion and world-outlook. Here I deal with the theory and practice of alchemy in its earlier centuries, its formative period. Egypt is centre of the picture, but to comprehend all the ideas and images flowing in to that centre we need to look also to the general trends in Greek scientific and philosophic thinking, and to the potent influences generated in the Iranian world of the Mazdean and Magian fire-cults.

Especially in the earlier phases the picture is involved and complex; but for this very reason the inquiry into what happened is in many ways all the more interesting. For we find an extremely rich and subtle merging of ideas and practices from a wide field to beget a new science, a new deep-going set of values and attitudes. With strange insight the Greeks intuited and sketched out systems of scientific thought which they were not able to explore with exact methods. Their atomist hypotheses are well-known; recently Sambursky has shown how the Stoics grasped the concept of fields of force, of continuous forces, of a cohesive and tensional continuum. I trust I have in turn shown how, amid much fantasy and confusion, the alchemists were not only the founders of experimental science, but also were struggling with ideas that belong to the future of science rather than its past.

J. L.

# 1

# Greek Scientific Thought before Alchemy

If, as this book tries to show, the emergence of alchemy marked a deep crisis in ancient thought and science, a crisis which could not be resolved from within the given framework and its preconceptions, then it is clearly necessary to begin with a discussion of what was achieved in the Classical and Hellenistic periods, and what were the limitations of that achievement, what were the boundaries that it was found so difficult to cross. But Greek philosophy and science of the 5th and 4th centuries B.C., with their roots in the 6th and 7th centuries, are very rich and complex; and attempts to set them out in brief succinct definitions are liable to end by giving a very imperfect and devitalised effect of what actually happened. Still, the problem cannot be evaded. We must try to generalise on various aspects of the development, concentrating on the main issues that were raised and their relevance for the alchemic revolt.

We begin then with the 7th century, with the growth of Ionian thought which sought in various ways to explain the universe by finding its fundamental principles and substances (or substance), and by concentrating on natural phenomena; and the Pythagorean school of South Italy, which had the same end in view, but sought the explanation of reality in Number, in an abstract principle. As two important expressions of these opposing viewpoints in the 5th century we may take the atomic theory of Leukippos and Demokritos, which saw all bodies as composed of ultimate and indivisible elements or atoms moving in an empty space; and the hypothesis of the universe's construction by the Pythagorean Philolaos, who argued for a central condensed fire and an outer fire surrounding the spherical universe, which itself was divided into three spheres, *Olympos* (that of the fixed stars) *Cosmos* (with the planets, sun, moon,) and *Ouranos* (the sublunar region in which is the earth and a theoretical anti-earth, *Antichthon*).

Philolaos also defined the elements in terms of geometrical figures: earth was made up by the cube, fire by the tetrahedron, air by the octahedron, water by the icosahedron, while a fifth element, which comprehended the others and was the bond of them all, was represented by the dodekahedron.

The Ionian thinkers had raised the question of what the universe was composed of, what single underlying substance—water or air or fire or some indefinable primary element, the *apeiron* (that without bounds or limits) of Anaximadros. Empedokles of Akragas in Sicily devised a theory of the elements working in a system of opposites, love and strife, attraction and repulsion; earth, water, fire, air floated in these two enclosing media which acted as material forces. At first there had been an harmonious spherical whole enveloped in Love, with strife extending on the outside. Strife absorbed the four elements, drove out Love, and created Chaos; but Love reasserted its power with a revolving motion; and in the central region, little affected by the universal rotation, the world was rebuilt. Air escaped first, but compressed by the limits of the universe it was changed into a hollow crystalline sphere; fire accumulated in one half of the sphere, making it luminous, while the other half remained dark—hence our earth, at the centre, sees the alternation of day and night. (Argument has gone on as to whether Empedokles saw the present world as belonging to the period of disorganisation by strife or to that of love-integration.[1]) Herakleitos had defined all things as moved by the unity and conflict of opposites; Empedokles sought to carry this sort of outlook into a detailed application of the struggles between the two conflicting forces, with Necessity as the sum of their activity, together with the "contract" that ties them together as they build and destroy—each of them limited by the effects of the other.

> Thus, Love brings forth at first partial assemblages with what it finds available at every point, and these assemblages undergo natural selection by virtue of Strife, which thus cooperates from the other side in creation; Love shapes forms out of drives caused by Strife, but also reabsorbs all varieties in the end, while later Strife sharpens, increases, articulates the variety brought forth by Love, yet to a destructive end. The forces remain constant in behaviour, but the fearful intricacies of their interaction give the effect of chance. The pattern of this interaction weaves together the obvious "intentionality", or shall we say functionality, seen in the order of life with the mechanical causality which ensures the over-all pulsation. Everywhere elements of matter and elements of function, of purpose and no-purpose, so to speak, are locked together in the universal mellay of process. (G. de Santillana)[2]



The emphasis put by Herakleitos and Empedokles on opposites or contraries continues in Greek thought, and is the source of both its greatest strengths and its greatest weaknesses. Aristotle, who makes the principle an insistent feature of his physics, declares that the theme was shared by Greek rational physics from the outset.[3] Indeed it could hardly have been otherwise; for in this matter the Greeks were carrying on the deepest and most pervasive element in primitive tribal thinking, where the dual organisation of society is reflected in every aspect of the way in which the universe and natural phenomena are regarded.[4]

The main bases of Greek thinking have thus been laid: (1) the idea of a *unitary process* in nature, of some *ultimate substance* out of which all things are built up, (2) the idea of a *conflict of opposites* which are held together by the overriding unity, as the force driving the universe onwards, (3) the idea of a *definite structure* in the ultimate components of matter, whether this structure is expressed by varying aggregates of atoms (*atomon*, indivisible unit) or by combinations of a set of basic geometrical forms at the atomic level. The two first positions were derived from the forms of thought created over very long periods by tribal society as it grew aware of its unity with, and its difference from, nature. The third idea was the product of a society in which individualism with all its small local conflicts, endlessly splitting up the general interest, had been born—above all, a society in which money-systems and mathematics had arrived as the expression of the new divisive forces inside the overriding unity, the strongly surviving tribal elements.

The whole of classical thinking was determined by the forms in which the problems of man and nature were thus presented. Action, movement, and change could be recognised and considered only under the categories devised out of general ideas of the unity of process and the conflict of opposites within that unity; but the thinkers were quite unable to arrive at concepts of causality in the sense of that term in the post-Galilean epoch. They could not fuse in any effective way the idea of the unity and conflict of opposites with that of the atomic substratum of reality. They saw the individual as a summation of a simple whole, as

embodying the unity of society, not that unity together with its inner conflicts which linked him with the other individuals in a complex situation of agreement and dissent, likeness and unlikeness, union and opposition. They had carried too directly and uncritically a tribal concept or image into a society divided by all sorts of discords, conflicts, divisions of class, property, and power. The individual (person or object) was seen as a sort of largescale atom, complete in himself or itself. Men did not inquire how each individual acted on another and affected him, or how objects impacted in motion; they thus avoided all problems of mechanical causation and the many connected matters. Instead, they asked what the nature of substance or identity was, and what were the links between the forms taken by substance. Relations thus became of extreme importance—but *relations regarded under the aspect of the powers or capacities of action residing inside the subject.* "Relations were assumed to have the status of attributes securely anchored in the independently existing substance" (Cornford).[5] Aristotle indeed has much to say of *causes*, but what he considers under this term is *form* and *matter*—that is, the internal constituents into which a total thing can be analysed. He sees three kinds of change: locomotion, or the movement from one place to another; growth or diminution, a change in quantity; alteration, a change in quality. So all changes are defined and explained in terms of the likeness or unlikeness of the things undergoing changes. We get comparisons of this sort, but not any precise computation defining the mechanics or dynamics of one object acting on another. Demokritos evolved his idea of atomic aggregations on the basis of *like to like*:

> All animals alike herd together with their own kind: doves with doves and cranes with cranes. And so it is with inanimate things, as you may see in the case of grains shaken in a sieve or the pebbles on the shore. The whirling motions of the sieve arranges the grains in distinct groups, lentils with lentils, barley with barley, wheat with wheat; and the motion of the waves rolls all the longshaped pebbles into one place, all the round ones into another, showing that the likeness of things tends to draw them together.[6]

And Leukippos remarked that the atoms, circling in the cosmic eddy, were "separated apart, like to like". Clearly the principle is drawn from some deep emotional need or predisposition, not from observation. If Demokritos had really watched the pebbles being rolled about on the beach, he would have noted the role



of weight and size, rather than likeness in form, in determining the distribution. These examples might be indefinitely added to to bring out the overwhelming predisposition of the Greek mind to find and apply the principle of "like to like". The Hippokratean treatise *On the Constitution of Children* accounts for the growth of various parts of the body from the seed on the principle of like to like: dense to dense, rare to rare, and so on. "Each thing moves into its proper place according to its own affinity."[7] The Hermetic work *Aphrodite* deals with the question why children look like their parents. The likeness is assumed; there is no question of glancing at children themselves and asking if they do in fact resemble the parents—as often they do not.

> When nutritive blood turns into a foam [? secretion] and the genital organs have provided seed, there is exhaled so to speak from the members of the whole body a certain substance, under the action of a divine force, as if it were the same man being born, and the same likeness results in the case of the woman. When the exhalation from the male dominates and remains intact, the babe is born resembling the father, just as, if the conditions are reversed, it will similarly resemble the mother.[8]

The ancients were thus primarily interested in *qualities*: what was like or unlike in various objects. *Quantities* such as weight seemed unimportant. In cosmic terms they saw the merging or separation of substances or elements with qualitative aspects such as hotness and coldness, wetness and dryness—or, when they dealt with atoms, similarities or differences in shape. Therefore the notions of heaviness or lightness were subsidiary, invoked only incidentally in describing the behaviour of like attracted to like or unlike repelled from unlike. Plato carried on the Empedoklean principle by which the scattered oddments of each element were always seen as rejoining the main mass. Weighing appears as a sort of violence done to the nature of substances:

> When we weigh earthy substances, we forcibly lift them into an unlike region [air] against their natural tendency, and they cling to their own kind. But the lesser bulk is more easily constrained than the greater and moves more quickly into the unlike region. Hence we have come to call such a bulk light and the region to which we constrain it up, and to call the opposites heavy and down. . . . So these determinatives must be variable and relative. . . . The passage of each body towards the kindred-aggregate gives the name heavy to the moving body and down to the direction of the movement.

Aristotle similarly refused to allow heaviness or lightness to be regarded as primary properties or powers of nature; they merely derived, he thought, from the tendency of simple bodies to make for their own proper region—earth to earth, air to air, and so on. So he lacked the basis for even beginning to work out any laws of movement, let alone a theory of gravitation. Things were moved by the attraction of likeness, not for any reasons of weight or mass. A free-falling body was seen as only one more example of the desire or need of unformed matter (potentiality) to reach the actuality of its form, as in the case of a seed becoming a fruit-bearing tree. Only when a body has reached its "natural place" at rest has it attained the completion of its form (lightness or heaviness).[9]

In Greek physics weight was thus the innate force of a body producing its natural motion towards its natural place at the centre of the earth; and the weight of a body was often compared to the human soul. Just as a man was considered to move and act by virtue of his soul (*i.e.* his form or *eidos*), so a heavy body moved downwards by virtue of its weight, which also was nothing other than its *eidos*.

So much for movement in space. As for changes in size, which are of great significance with regard to processes of nutrition and growth in organic bodies, Empedokles, Anaxagoras, and Plato all again invoked the cosmic principle of like calling to like. "All the tissues," says Plato, "as they are irrigated with the blood, repair what they have lost by evacuation. The character of this depletion and restoration is the same as that of the movement of the universe, where all things go towards their own kind."[10] Again, as for alteration in quality, Demokritos held that "agent and patient must be the same or alike; for if different things act on one another, it is only accidentally by virtue of some identical property." Aristotle said only Demokritos insisted that like alone could act on like, but elsewhere he saw the same principle in Empedokles' doctrine of perception; and Theophrastos attributed it also to Diogenes of Apollonia.[11] Here indeed most thinkers took the opposing view: that unlikes affected one another, *e.g.* the heat of fire warmed cold hands. But they were all agreed in looking for qualities which affected other qualities.

In early theories of knowledge the like-affects-like formula was widely accepted. "The physical philosophers," says Sextus, "have a doctrine of high antiquity that like things are capable of knowing one another."[12] Empedokles declared, "By earth we see earth, by water water," and so on. When attempts were made to explain perception by the passage of effluvia or exhalations from an object to the affected sense-organs, this outlook was given a new force. Like was considered to move to like. Theophrastos adds a further reason: "It is natural for all living creatures to recognise creatures of their own kind." In later antiquity, partly through the influence of Stoicism, which we shall soon examine, the idea of magical concordances and harmonies of force or influence entangling the whole universe in one vast and infinitely complicated network was general. Thus the Neoplatonist Plotinos says:

> How are magical practices to be explained? By sympathy, by the existence of a concordance of like things and a contrariety of unlike things, and by a diversity of many operative powers in the one living universe. Without any external contrivance, there is much drawing and spell-binding. The true magic is the Love and Strife in the universe. In magical practices men turn all this to their own uses.[13]

He uses the same terms, *Philia* and *Neikos*, as did Empedokles nearly 700 years earlier.

I have stressed the fact that certain preoccupations born from the social situation, from the whole way of life of the Greeks, held them up from breaking through into new fundamental positions. It was not any exhaustion of mathematics itself that caused the hold-up, as is often stated. With the least change in social pressures, there was a continual ferment of ideas and methods, which seem for a moment as if the leap into new positions is about to take place. An inability to conceptualise (to grasp as a general factor free for application in new ways) the rate-of-change of the rate-of-change is what separates Archimedes from Newton by a barrier that the former could never cross.

> Purely mathematically, there is nothing in Newton's *Principia* that was not familiar to Archimedes, except the notion of the rate of change of a velocity. And even here, only the notion was alien to Archimedes, and not the power for formalising the notion mathematically, if by some reversal of history it had come within his purview. In fact, purely mathematically Archimedes was much better equipped for dealing with it formally than was Newton, seeing that Newton did not manage to define really rigorously the notions of velocity and acceleration to the very end of his days. (Bochner)[14]

One characteristic of Greek society in almost all fields was the carrying-over of tribal ideas and methods of organisation, though



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the rapid development of the system kept lifting these ideas and methods on to new levels, with new centres and applications. Hence, as I have argued, the confusion induced by attributing to the new "atomic individual" with all his great powers of initiative (and also of discord and violent self-assertion) the simple refraction of the social whole which had been substantially true in far-back days of tribal brotherhood and equality. A key-aspect of the divisions introduced into society, denying the simple refraction, was the advent of the cash-nexus, of money-values continually disrupting old relationships and balances; another was the growth of slavery in all sorts of new forms outside its primitive aspect of chettel-slavery. The slave was the obvious example of a man reduced to a thing, the complete reflection of the cash-nexus with its "thingification" of relationships. The existence of large numbers of slaves, on whom was concentrated the burden of manual labour, meant that the slave (a thing, not a man) represented the mechanistic principle of his society. The use of a man-machine had obvious limits in comparison with the machine proper; but the latter, with its necessary mathematical and other scientific bases, could only develop in a society that felt the pressures urgently making for productive advances, yet could not put the burden simply on the man-machine. Hence the way in which the 17th century initiated the forms of modern science making possible the largescale invention and application of all sorts of machine-extensions of the human frame. Slavery as it existed in the Graeco-Roman world created a social and psychological barrier to the development of mechanics and dynamics in the post-Galilean sense. Not that we must think of it as a sort of external system unfortunately imposed on its societies. In the last resort it proceeded, not out of any purely economic motivation or need, but out of the total human situation, which in turn it affected and modified. The concept of the "atomic individual" as the free man (with all its virtues of liberating men from ancient constraints) had as its reverse side the concept of the man-thing or man-mechanism; the new sense of freedom was dogged all the time by an increasing sense of fate or necessity. Hence the dilemma of Greek thought, which on the one hand was richly aware of the patterns of change and on the other hand could not advance from dialectical generalisations to applications in mechanics and dynamics.

The only quantitative formula which Aristotle attempted



assumed a proportionality, not between force and acceleration, but between force and velocity. This was equivalent to saying, incorrectly, that the force is equal to the product of load and velocity—as against Newton's second law, in which acceleration takes the place of velocity. That is, Aristotle, like every other ancient thinker, was quite blank as to the existence of friction as an opposing force to be considered when defining relations between forces as causes-of-motion and the motions that in fact resulted. (The sole exception was Themistios in the later 4th century A.D., who remarked, "Generally it is easier to further the motion of a moving body than to move a body at rest.") Aristotle, considering men at work hauling a ship over land, saw as the only two factors the weight of the boat and the hauling powers of the men. These two factors were imagined as existing in a sort of vacuum, with all other factors (friction) eliminated. The notion of the men as abstract things or machines inhibited the thinker from approaching the situation concretely and discovering the actual laws of mechanics.[15]

It is perhaps not going too far if we link the Greek refusal to consider the mathematical forms that would have led to mechanics of the Galilean type (or the phenomena that led to the mathematics), with the hatred of the dominant thinkers for any form of equality. Ploutarch in a discussion on Plato's statement (authentic or apocryphal) that "God is always busy geometrising", makes one of his speakers remark:

> For the Equality aimed at by the many [arithmetical equality] is the greatest of all injustices, and God has removed it out of the world as being unattainable. But he protects and maintains the distribution of things according to merit, determining it geometrically, that is, in accordance with proportion and law.[16]

Hence the liking for geometrical systems, such as we find in Philolaos and Plato, where one set can be considered superior to another. Certainly Plato and Aristotle held strong views that the distribution of things to persons of unequal merit was unequal. The linking of social and intellectual positions in this relation is not so odd as may seem at first sight when we recollect how much the Pythagoreans' concepts of "proportion and law" were determined or stimulated by their political struggle as a middle force against both aristocrats and plebeians. Once such a bias had been established, a bias that was powerfully in accord with the emotional outlook of the main thinkers of the classical period, it

became almost too deeply rooted to be questioned. To estimate its strength we must again link it with the whole psychological and intellectual complex set up by the existence of slavery. In defending the rejection of juridical equality by the Roman system, Cicero attacked as unequal that kind of equality which "does not recognise grades of dignity".[17] Such an attitude, pervading all the spheres of thought and emotion, was a second-nature for the dominant class and its spokesmen, and affected the whole of society, limiting even the attempts at revolt.

The Greeks developed mathematics incomparably beyond the level reached by the previous most talented practitioners, the Babylonians; but despite all the new ground they broke, the limitations of outlook sketched above laid down in the last resort the extent to which development here too was possible. Because of the concentration on the isolated object and its qualities, its form, geometry played a key part in the scientific approach and in defining the limits of mathematical expansion. In the detailed development over the centuries the results were highly complex; for there was every now and then a strong chafing against the barriers, momentary flashes of deeper insight, or the promise of methods that would in fact break through, above all by the Stoics and then by Neoplatonists of later antiquity. But always the barriers rose up again and prevented any effective application of the new ideas. The sort of dilemma that kept coming up may be illustrated from a paradox set out by Demokritos:

> If a cone were cut by a plane parallel to the base, what must we think of the surface of the sections? Are they equal or unequal? For if unequal, they will make the cone irregular, as have many indentations, like steps, and unevennesses; but if they are equal, the sections will be equal, and the cone will appear to have the property of the cylinder and to be made up of equal, not unequal circles, which is quite absurd.[18]

His problem could not be met within the static concepts of atomic lengths, *i.e.* of constant magnitudes, however small those magnitudes were conceived. The instrument for solving the query could only be provided by the dynamic concept of the limiting process and the other notions of the infinitesimal calculus. The Stoic Chrysippos did evolve a conception of the limiting process that made possible a deeper grasp of the nature of infinite sequences of inscribed and circumscribed figures, which Greek mathematicians cautiously evaded when using methods of exhaustion. But the sort of breakthrough that came with Galileo and Newton did not happen, and could not happen, in a world where there were so many assumptions and methods based in the older classical positions.



Astronomy was the field where the method was fully mathematical. Other branches of research acquired varying degrees of mathematical expression. Aristotle knew already a science of Optics subordinate to geometry and Harmonics subordinate to arithmetic, not to mention a Mechanics subordinate to three-dimensional geometry; and remarks of his show that the Pythagoreans visualised some sort of mathematising of physics.[19] But this was never brought about. Archimedes' laws on the balancing of the lever and on floating bodies pertain to mathematical physics and were the first of their kind, but they did not bring about any further movement in the same direction.[20] He and his followers arrived in some covert and unexplained way at the concept of the statical moment, but they left the concept untouched and unquestioned in their formulations. It was not conceptualised —that is, conciously grasped in its implications—till the 17th century. In the same way the Greek could not form a notion of the relation of relation, the property of properties, the aggregate of aggregates. Aristotle even polemised sharply against the possibility of a motion of motion.[21] Archimedes lacked coordinate systems or mathematical functions; still in *On Spirals* he came close in his own way to forming the derivative of a function:

$$\frac{dy}{dx} = \frac{df}{dx} \qquad (1) \qquad :$$

which is the mathematical prerequirement for the "abstract" conceptualisation of the notion of velocity. However, in order to advance to the concept of acceleration, one has to be able to form a second derivative. This requires that one form the derivative (1) at each and every point $x$, then view the resulting mathematical object as a new function in $x$, and then apply the "abstract" process of differentiation to this new function again. It is this kind of interation of logico-ontological abstractions to which Greek thinking was never able to penetrate to any noticeable extent (Bochner).[22]

But we do not want to go into detailed mathematics here. We are concerned with the general points; and what has been said above will suffice to bring out on the one hand the limitations imposed on Greek scientific thinking by certain deep preconceptions,

ultimately social in origin, and on the other hand the way in which they chafed against the limitations at various times but could not break through and establish new basic positions from which to advance in new directions.

How far late antiquity was able to devise a programme of theoretical physics without being able to put it into action can be gauged from a passage in Iamblichos (who died about A.D. 330):

> Sometimes it is also the practise of mathematical science to attack perceptible things with mathematical methods, such as the problem of the four elements, with geometry or arithmetic or with the methods of harmony, and similarly other problems. And as mathematics is prior to nature, it constricts its laws as derived from prior causes.
>
> This it does in several ways: either by *abstraction*, which means stripping the form involved in matter from the consideration of matter; or by *unification*, which means by introducing mathematical concepts into the physical objects and joining them together; or by *completion*, which means by adding the missing part to the corporeal forms which are not complete and thus making them complete; or by *representation*, which means looking at the equal and symmetrical things among the changing objects from the viewpoint whence they can be best compared with mathematical forms; or by *participation*, which means considering how concepts in other things participate in a certain way in the pure concepts; or by giving *significance*, which means by becoming aware of a faint trace of a mathematical form taking shape in the realm of perceptible objects; or by *division*, which means considering the one and indivisible mathematical form as divided and plurified among individual things; or by *comparison*, which means looking at the pure forms of mathematics and those of perceptible objects and comparing them; or by *causal approach* from prior things, which means positing mathematical things as causes and examining together how the objects of the perceptible world arose from them.
>
> In this manner, I believe, we can mathematically attack everything in nature and in the world of change.[23]

For our purpose the most important work by Plato was the *Timaios* in which he set out his cosmogony, his scheme of physics. He draws a bold and complex picture of the creation of the universe by the *demiurge* (a word he took from Philolaos). He makes no reference to Demokritos, probably through contempt for mechanistic systems; yet he draws from him the assumption that the phenomena known to our senses are rooted in discrete invisible elements, whose aggregates and interactions cause or



underlie all physical occurrence. However grudgingly, his theory is an atomic one. From the Pythagoreans however he takes the assumption that Number forms the basis of all physical events. He holds that there are certain symmetries in the structure of matter, so that the correct approach is one of three-dimensional geometry. Not that he sees simple systems of order. In his universe there is a deep and ceaseles struggle of the uniform and the non-uniform, the ordered and the disordered, which we can best describe as a stuggle of the symmetrical and asymmetrical aspects of structure. He himself uses these terms:

> All that is good is beautiful, and the beautiful is not without measure. . . . Of symmetries we distinguish and reason about those that are small, but of the most important and the greatest we have no rational comprehension. With respect to health and disease, virtue and vice there is no symmetry or lack of symmetry greater than that which exists between the soul itself and the body itself.[24]

Asymmetry or non-uniform combinations and structure bring about instability and change. Speaking of Fire he writes:

> Now the liquid kind, in so far as it partakes of those small water-particles which are unequal, is mobile both in itself and by external force resulting from its non-uniformity and the shape of its figuration [the *idea* of its *schema*]. But the other kind, composed of large uniform particles, is more stable than the first, and is heavy, being solidified by its uniformity; but when fire enters and dissolves it, this causes it to abandon its uniformity; and when this is lost, it partakes more largely of motion. And when it has become mobile, it is pushed by the adjacent air and extended upon the earth. For each modification [*pathos*] it has received a descriptive term: *Melting* and *Fluidity* for its extension over the earth.[25]

For the four elements he followed Philolaos in taking four perfect bodies, omitting the fifth one for which he had no use. He made the same correlations as Philolaos. Wanting to explain transitions from liquid to gaseous states and back again, he needed common features in all or some of the four elements in order to show how one could change into another. The first three figures were all bounded by equilateral triangles, which permitted the establishment of relations between them; the cube was however bounded by squares so that it could not be resolved into such triangles by further division. So there was no transition from earth to fire, air, or water. Still, Plato did not take the equilateral triangle or

square as his basic structural unit; instead he divided all his elements into rectangular triangles. The advantage of the breakdown into small structural units was that sets of equilateral triangles or squares of varying and increasing sizes could be constructed, to represent the series of elementary bodies of different sizes. Plato was also thus able to differentiate between various kinds of fire (including light) and so on. But within each series the tetrahedron was the smallest body, being made up of the least number of triangles; it thus provided two of fire's characteristics: mobility (smallness) and penetrability (sharpness of the solid angle). Demokritos had had to suppose that two separate properties were owned by fire: smallness and sphericity; Plato reduced them to a single basis.

We are not sure how much detail he borrowed from Philolaos; but in general we may say that he first worked out a scheme of interlocked structures in matter which permitted the change of one element into another. He may then be claimed as the founder of alchemy as a science, even if it was to take some time before the implications were worked out. He saw metals as the product of fusible water (not to be identified with ordinary water).

> Of all the kinds of water we have termed fusible, the densest is produced from the finest and most uniform particles: this is a kind of unique form, tinged with a glittering yellow hue, even that most precious of possessions, *Gold*, which has been strained through stones and solidified. And the offshoot of Gold, very hard because of its density and black in colour, is called *adamas* [perhaps haematite or platinum].
>
> And the kind that closely resembles gold in its particles but has more forms than one, and in density is more dense than gold, and partakes of small and fine portions of earth (so that it hardens), while it is also lighter because of the large interstices within it, this particular kind of solid waters, being thus compounded, is termed *Bronze*. And the portion of earth that it is mixed with becomes distinct by itself, when both grow old and separate again from each other; and then it is named *Rust* [*ios*].[26]

There is a strong suggestion of the possibility of the transmutation of metals with special reference to gold. "Now imagine a man modelling all possible figures out of gold and then proceeding without stop to remodel each of these into every other, if someone were to point to one of the figures and ask what it is, by far the safest answer in point of truth would be that it is gold." Only "the substratum which receives all bodies" is stable and constant.[27]



We may note too the important role of fire, which suggests metallurgical process as does the very term "fusible water".

> As the fire, on issuing from the water, does not pass into a void but presses on the adjacent air, this in turn compresses the liquid mass which is still mobile into the abodes of fire and combines it with itself; and the mass, thus compressed and again regaining its uniformity, through the departure of the fire, the author of its non-uniformity, returns to the state of self-identity [symmetry]. And this cessation of fire is termed *Cooling*, and the combination that follows on its departure *Solidification*.[28]

It is important to note that the essential ideas of cosmic creation or natural process are all drawn from human crafts and industries. The term for the creator (or fundamental creative activity) is *demiourgos*, craftsman. Like all ancient thinkers (and many others besides), Plato assumes that any form of purposive movement or significant development implies a prior act of decision carried out by a person; he cannot rise to the concept of purpose as born out of the totality of a situation with its inner formative process, even though he himself has shown how development could occur through the symmetry-asymmetry principle. His demiurge works by a *paradeigma* or pattern, a term used by Herodotos for an architect's model or plan of a building, or for samples, *e.g.* of mummies made of wood. The term is also used for a sculptor's or painter's model. Plato himself uses the metaphor of modelling, as in the passage cited about gold and elsewhere: "When the generating Father perceived it [the cosmos] in motion and alive, an *agalma* [honour, statue in honour of the gods], he too rejoiced, and, well pleased, designed to make it resemble its *paradeigma* yet more closely."[29] He also draws on the techniques of perfume-making. Substance is voided of all forms "just as with all fragrant ointment men bring about the condition by craft, *technë*, to make the odours as odourless as possible; and all who set out to mould figures in any soft materials wholly refuse to allow any previous figure to remain visible in it, and begin by making it as smooth as possible before they carry out their work."[30] He also uses the analogy of winnowing with a sieve to explain how the particles separate and fly about, the dissimilar driven apart, the similar drawing together.[31] In a play on words he brings out how the term *apeiros* suggests the unskilled as well as the unlimited or chaotic: that is, it represents the world before craft-skill (formative process) gets to work on it.[32]

Besides the principle of symmetry-asymmetry as the source of

movement and development. Plato also uses his triadic formula. "It is not possible for two things to be joined together without a third." On the principle of like-to-like he states that the triadic nature of the soul (its fusion of Identity, Otherness, and Essence) is reflected in the structure of the universe. He puts the point in an idealist way, turning the abstractions into substances and giving them as plastic material to the demiurge to make souls out of; but the notion of a triadic movement both in the soul and in nature, making a dialectical unity of all process, is nonetheless present.[33]

We now come to two aspects of Aristotle's thought that concern us: the way in which he developed the scheme of elements able to move round or be combined in various ways, and his definition of metals and stones. He supposed the ultimate basis to be a primitive matter or *prima materia*, which had only potential existence till impressed by form. Form was not only the geometrical structure but also the total inner organisation of a thing; it was the sum of its qualities and properties, and gave it its identity. In its simplest manifestation it turned the primal matter into the four elements, fire, air, water, earth, through a variation of qualities arising from heat and cold, fluidity and dryness. Each element had two of these qualities and no more. But the opposites, heat and cold, dryness and fluidity, could not be mated. So the four possible sets of combinations were: hot and dry (fire), hot and fluid (air), cold and fluid (water), cold and dry (earth). In every element one quality dominated: dryness in earth, coldness in water, fluidity in air, heat in fire. Through the medium of shared qualities one element could pass into another, *e.g.* fire into air through the heat they shared, and so on. Two elements could pass together into a third, through each discarding one quality, as long as the effect was not to leave two identical or two contrary qualities. Thus, air and earth, by dropping fluidity and cold, could produce fire (heat and dryness). Aristotle taught that what was changed was only the form; the underlying matter was always the same.[34]

Plato definitely bases his system of changes in matter on variations and combinations of geometrical structures, which are capable of mathematical definition. Aristotle appears to assume varying arithmetical combinations of the different elements, plus similar sorts of variation inside an element; but he gives no clue, for example, as to how an element discards one of its qualities, *e.g.* how air drops its fluidity and earth its coldness so that the two



of them may produce fire. Neither are we given any idea how the proportions work out in any precise way in substances:

> They contain earth because every simple body is specially and most abundantly in its own place. And they all contain water because the compound must possess a definite outline and water alone of the simple bodies is readily adaptable in shape. Moreover earth has no power of cohesion without the moist. On the contrary the moist is what holds it together. It would fall to pieces if the moist were completely eliminated from it.
>
> They contain earth and water then for the reasons given; and they contain air and fire because these are contrary to earth and water—earth being contrary to air and water to fire, in so far as one substance can be contrary to another. Now all compounds presuppose in their coming-to-be constituents which are contrary to one another; and in all compounds there is contained one set of the contrasted extremes, *i.e.* cold-dry [earth] and cold-fluid [water]. Hence the other set [hot-fluid, air, and hot-dry, fire] must be contained in them also, so that every compound will include all the simple bodies.[35]

So deep-rooted is the concept of any body as involving a union of opposites that Aristotle assumes it in his exposition. He imagines the cosmos as made up of 59 concentric spheres, with the earth at the centre, water making up the next sphere, then air, then fire—though with no hard boundary-lines. Each element has a natural tendency to move to its own place. The union of contraries prevents what he has called "excesses". If earth gathers in excess, it will destroy the intermovements among the elements which create reality and its diversity of objects; and so on with each element. In fact then we find an enormous number of distinct compounds, though any one of them will be changed into any other if we alter the relative proportions of the composing elements in the required direction.

As for metals they are born of exhalations. Vaporous exhalation is moist and cold, produced when the sun's rays fall on water; the smoky is hot and dry, produced by the rays falling on dry land. In actuality the two vapours mix in varying degrees. The heat of the dry one causes minerals, stones that cannot be melted such as realgar (arsenious sulphide), ochre and ruddle (clayey iron oxides), and sulphur. The heat of the moist one causes metals, which are fusible or malleable, such as iron, copper, gold. Though metals and minerals like all things contain something of all four elements, water and air (chiefly water) predominate in metals, and

earth and fire (chiefly earth) in minerals.[36] (The alchemists identified the dry vapour with sulphur, the moist with mercury, and developed the theory that all metals were made up of mercury and sulphur.) Aristotle distinguished chemical combination, *mixis*, and mechanical mixture, *synthesis*; the *mixis* of liquids had its own term, *krasis*. However his notion of chemical combination (as in drugs) was unclear. He thought it a kind of mutual assimilation if the components managed to form a homogeneous whole, and so was led to insist that a weak component was merely absorbed by a stronger one—without working out any ratios for such a situation to develop.[37]

Exhalation is compressed (*i.e.* condensed) by the dryness of the rocks, and congealed or solidified, apparently by cold. The admixture of dry exhalation however prevents the metal from reverting to water. "All metals are thus affected by fire and contain earth, since they all contain the dry exhalation. Only gold is unaffected by fire." The exposure to fire makes metal produce dross and change colour; Olympiodoros adds that for the same reason they rust. The presence of earthy matter thus explains the difference between the baser and more precious metals. Gold, with the least amount of dry exhalation, is at one end of the scale, and iron, with the largest amount, at the other. Aristotle did not make this point, but it was duly noted by the alchemists.[38]

Theophrastos in *On Stones* worked these positions out further. Stones and (mined) earths are made of earth as metals of water. The earth becomes a pure and uniform matter as the result of a conflux, when it is a lump, or of filtering, when it is in veins, or of some other process of separation. This uniform matter, subjected to heat or cold, undergoes solidification and forms the stones or mined earths. At what stage is colour thought to be brought in? At the stage of making matter uniform or that of solidification? Presumably at either or both. But there seems an idea that only solidification by heat will beget a change in colour at the final stage of formation; for the change of yellow ochre into red gets the comment, "Fire would appear to be the agent responsible for all these transformations." In the *Timaios* Plato had taken colour to be a fire itself, which owns particles "so proportioned to the visual stream as to produce sensation". Colour effects are brought about by the differing sizes of the particles, which dilate or contract the visual stream.[39] There was a strong fire-element also in Aristotle's smoky exhalation, "the most inflammable of



substances", and "potentially like fire". He admits that it was something hard for us to envisage, but in some of its states it was fiery and in others not unlike a gas. Hence, once thinkers took an active relation to natural processes and wanted to repeat them in a laboratory, it was natural they should turn to fire, to fusion and distillation, in the attempt to change one metal into another.[40]

There was already indeed a clear idea that art (*technē*, which embraced any sort of craft-activity, including scientific expriment) was a way of learning to understand and control process by reproducing it under man-made conditions. Thus Theophrastos remarks, in connection with one of the colour-discoveries which played an important part in developing the alchemic idea:

> Here [a spot above Ephesos where alone cinnabar was manufactured] a sand which glows like the scarlet kermes-berries is collected and thoroughly pounded to a very fine powder in stone vessels. It is then washed in copper vessels and the sediment is taken, pounded and washed again. There is a knack in doing this, for from an equal amount of material some workers secure a great amount of cinnabar, and others little or none. However, use is made of the washings that float above, especially as a wallpaint. The sediment which forms below turns out to be cinnabar, while all that is above, which is the great part, is merely washings.
>
> The process is said to have been invented and studied by Kallias an Athenian from the silvermines, who collected and studied the sand, thinking it contained gold owing to its glowing appearance. But when he found it contained no gold, he still admired its fine colour and so came to discover the process, which is by no means an old one, but dates back some 50 years before the Archonship of Praxiboulos at Athens.
>
> From these examples it is clear that *technē* imitates nature, *physis*, and yet produces its own peculiar substances, some for utility, some merely for their appearance like wallpaint, and some for both purposes, like quicksilver—for even this has its uses. It is made by pounding cinnabar with vinegar in a copper mortar with a copper pestle. And perhaps one might find several things of this kind.[41]

We see then that both Plato and Aristotle played a leading part in popularising the idea that matter was composed of elements which could be changed into one another. The Aristotelean formulation in particular became very widely known and accepted. Plato's *Timaios* however received a new and deepened attention with the rise of Alchemy, Gnosticism and Neoplatonic philosophy in general.

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There is one more important line of thought which we must glance at before we turn to alchemy itself: that of the Stoics. Stoic philosophy was the great creation which came up to sustain men's minds after the breakdown of the city-state and of the philosophic forms derived from the way of life there. The free expansion of thought and art which had occurred in archaic and classical Greek cannot be separated from the successful building-up of the city-states, their elimination of the kingship and the heavy hieratic culture which had everywhere accompanied the growth of kingly state-forms. But now, after Alexander the Great, the kingship had been imposed after all. The imposition occurred, however, on a culture which had been developed in the city-state's days; and the result was therefore complex. The Stoics on the whole expressed the positive side of the new situation, doing their best to get rid of what I have called the atomic individual or object. However, under ancient conditions, the isolation of the individual in his specific form, his qualities and attributes considered as a sort of self-generated entity, could not be overcome. The Stoic in one sense was more than ever driven back into himself, needing to work out an ethic of self-sufficiency, endurance, and *apatheia*; but in his struggle against isolation he produced a new conception of the unity of process and of the interrelation of objects or beings inside it.

The key-concept was enclosed in the term *pneuma* (breath, often a synonym for air), defining the pervasive substratum in a cohesive universe, which, unlike Aristotle's, was surrounded by a void. For Aristotle, coherence, *syntecheia*, involved the notion of continuity in a geometrical or contiguous sense; the Stoics now gave the term a sense of dynamic cohesion in the physical world. The concept of *pneuma* had had a long history. Anaximenes, with his notion of the universe evolved out of air by condensation and rarefaction, declared, "As our soul, being air, holds us together, so do breath and air surround the whole universe." There was also in *pneuma* an association of in-and-out movement, of breathing, a rhythmic participation in the life-process. For the Stoics *pneuma* was air and fire, active elements or forces of cold and heat; they added the qualities of dry and moist in order to distinguish between the *pneuma* of the soul and that of plants, *physis*. The former *pneuma* was dry and warm; the latter moist and cold.[42]

The familiar Stoic aphorism, "Nature is a *technikon* fire, going on its way to creation," stated emphatically the unity of craft-



method and natural process. *Technikon* means "working like art, like craft". Hippokrates had spoken of "innate heat", and Galen took this to be the cause of metabolism. The Stoic Kleanthes declared, "This element of heat possesses in itself a vital force that pervades the whole universe."[43] Matter was seen as of two kinds, *hyle*-like or passive, and *pneuma*-like or actively cohesive. Coherence was a positive force, *synetike dynamis*; and *pneuma*-like matter was characterised by tension, *tonos*, an inner heat of fire. As *pneuma* entered into organic and inorganic matter alike with its admixture of air and fire, it pervaded the whole universe and made it a single inter-related unit drawn together by an endless series of tensions. In the consistent linking of *pneuma* with *tonos* the Stoics made their greatest and most characteristic contribution to scientific thought.[44]

*Pneuma*, as an active force, generated all the physical qualities of matter. Thus

> the Stoics generalised their continuum theory into a field theory; the pneuma is the physical field which is the carrier of all specific properties of material bodies, and cohesion as such thus gets a more specific meaning by becoming *hexis*, the physical state of the body. The following quotation from Chrysippos' *On Physical States* is very instructive:
>
> "The physical states are nothing else but spirits, because the bodies are made cohesive by them. And the binding air is the cause for those bound into such a state being imbued with a certain property which is called hardness in iron, solidity in stone, brightness in silver."
>
> And a little later he continues, "Matter, being inert, by itself and sluggish, is the substratum of the properties, which are *pneumata* and air-like tensions giving definite form to those parts of matter in which they reside."
>
> This gives some idea of the central position in the Stoic theory of matter of *hexis*, which denotes the structure of inorganic matter in a similar way to which *physis* expresses organic structure, and *psyche* the structure of the living being. (Sambursky).[45]

Inorganic entities were classified as discrete, contiguous and unified. Discrete entities might be in disorder or in a certain kind of order (like soldiers on parade); contiguous were conjoined, like chain-links or stones in a wall; unified, like a stone or a metal "ruled by a single state". The co-existence of the elements in the highest structure was *sympatheia*. A living body was a form of unified structure: Galen describes the faculties of the human body as structural elements of its physiology, extending throughout its totality.[46]

There are many more important aspects of Stoic physical theory; but here we may add three more points. First, each soul had an *hegemonikon*, a dominant part (generally considered the heart), The *hegemonikon* centralised and coordinated impressions, lifted them into consciousness, and set off the reacting impulses and actions. Secondly, that there were four successive stages thought to take place of increasing specification of an object, each stage including those that had happened before it. These were *substratum* (shapeless passive matter); *quality* (which the pervasive *pneuma* imbued); *state* (the sum total of components, air and fire, in their varying proportions); and *relative* (determining the relation between the physical states of different bodies). It has been pointed out how well these categories correspond to the methodological scheme of Newtonian dynamics. Simplikios divided the fourth stage into two kinds of relations: *relative state* (defined by that of another thing outside the object) and *relative*, which referred to things capable of change (*e.g.* bitter and sweet). *Hexis* was an example of the *relative*, expressing the physical continuum that covered an infinity of differing states, each of which could evolve from the other by a continuous transition brought about through "the change of the former quality". Such a development involved a series of changes in the pneumatic tensions permeating the body in question. Thirdly, as we would expect from the notions of *pneuma*, *hexis*, and *tonos*, the Stoics deepened the whole concept of mixture. Fusion, as distinct from Aristotelean composition, they saw as a total mixture, "Whereby," as Plotinos, dissenting, said, "there is no part of the mixed substance which does not participate in the mixture as a whole." In order to show their opposition to Aristotle, Chrysippos stated, "There is nothing to prevent one drop of wine from mixing with the whole sea," and the Stoics were much interested in cases of extreme dilution: gold finely suspended in certain drugs or burnt frankincense rarefied in a vast volume of air.[47]

The Platonic, Aristotelean, and Stoic ideas that we have here outlined all played an important part in the development of alchemic theory and practice as we shall see with the unfolding story. The great period of Stoic physics was the 4th and 3rd centuries B.C., when alchemy was gradually coming to a head, if we are right in dating its founder, Bolos, around 200 B.C.; and Stoic ideas certainly did a great deal in making the work of Bolos possible. The next five hundred years saw the maturing of alchemy; they also saw the development of Neoplatonism as the dominant



philosophy of late antiquity. Alchemy and Neoplatonism shared many characteristics. What Neoplatonism stood for will emerge as our story goes on. Here it will suffice to say that in certain essential respects it represented an attempt to reassert the Platonic idea of hierarchical levels of being inside the organic pantheist Stoic universe. The Platonic system, partly modified and changed by the transposition, took on new complexities and richnesses as a result. But in seeking thus to define the existence of qualitative levels inside the unitary cosmos, the Neoplatonists were driven back to transcendental notions of deity, denying the pantheist materialism of the early Stoics. The ancient world always saw hierarchy or development as coming down by stages from above, not as a movement from below upwards. At most the upward-movement was conceivable as a return along the tracks laid down by descending spirit or deity. Thus Neoplatonism was agitated by an inner tension between the notions of unity and of hierarchy, of organic and continuous forces or processes and of a pattern imposed from above by a Monad outside the universe.

Gnosticism and the Hermetic creeds shared with it a belief in the descent of life or spirit through different levels or stages down to the earthly level. They sought to find the way aloft again, not merely by philosophical reasoning, but by a *gnosis*, a knowledge that was the gift of revelation. As part of the Stoic heritage, together with the vast amount of folklore and magical recipes which were given a fresh force in the light of Stoic concepts, these creeds, like Neoplatonism itself, had a profound sense of the complex interrelationships and correspondences inside the organic or vital (pneumatic) whole—while at the same time they suffered from an intense sense of loss, of an agonising division that cut across the face of life. It was precisely, indeed, the dialectic of these two opposed positions which gave such strength and fascination to the period's dreams, fantasies, deep insights, comprehensions. Alchemy was richly a part of this world, torn by many of the same contradictions, but with a secure difference. Alone it clung, despite confusions and ambiguities, both to the belief in varying levels and structures, and to the Stoic position that the *psychē* was material, that there was a mutual penetration of soul and body, of *physis* and the world of plants, of *hexis* and the world of inorganic matter. It consistently saw all the more solid or specific elements as permeated and held together in the infinite network of pneumatic tensions.[48]

# 2

# Historical References

ONE way of getting at the difficult and elusive problem of the origin of alchemy is to search for certain or probable references to alchemic ideas and practices in the centuries before the art comes out into the open. We need not expect direct references to be frequent, as the alchemists lived an underground kind of existence. Still, with the extreme difficulty of dating their first definite activities and the lack of any clear manuscript tradition, the quest for signs of those activities in the broader fields of culture is the only sure way of anchoring them in history. What then are we to seek for? First, any suggestion of the transmutation of metals. But, beyond that, any unmistakable signs of a chemical outlook emerging, of a view of reality which looks to chemical processes rather than to geometrical structures or arithmetical combinations and proportions for the understanding of matter and cosmic systems. This line of approach also has the value that it brings us concretely into the cultural situation out of which alchemy was born and which it played an important part in gradually changing.

First, there is a suggestive turn of phrase in a fragment from the poet Kratinos, who belongs to Attic Old Comedy: "What [in the town] seems golden becomes lead again in the country."[1] This passage does not prove the existence of alchemical ideas, but it implies some sort of belief in a possible transformation of lead into gold and gold into lead—in a hierarchical system of metals with gold at the top and lead at the bottom. The notion that gold had some special life-giving power was of course very ancient and extremely widespread; and the gleam of gold early suggested sunlight. Pindar links gold coins with the sun. Especially in Egypt the concept of divinisation involved a transformation of the body into precious stones or metals. In the tale of King Kheops and the Magicians, the pious kings of the 5th Dynasty are born with gold stamps that reveal and express their power:



> The child slipped forth on to her hands, a child of one cubit with strong bones; the royal titulary on his limbs was of gold and his head-cloth of true lapis lazuli. They washed him, cut his navelstring, and laid him on a sheet on a brick. And Mesekhent [birthgoddess] drew near to him and said: "A king that will exercise the kingship in the entire land." And Khnum gave health to his body.[2]

The royal children are imagined as inlaid bronze figures. From Mesopotamia we have a bronze figurine of a kneeling worshipper who makes an offering for Hammurabi; the hands, face, and beard, though not the hair, are plated with gold, while the left wrist bears a golden bracelet, the right one a bracelet of bronze. It seems that the man is supposed to have washed his face in water from the lustral stoup projecting from the base; and the purified parts of his body are shown as gold—in some sense they have been transformed, approximated to the divine.[3]

That the Greeks held the same sort of ideas in this respect as the Egyptians and Mesopotamians is shown by a passage in the *Odyssey*:

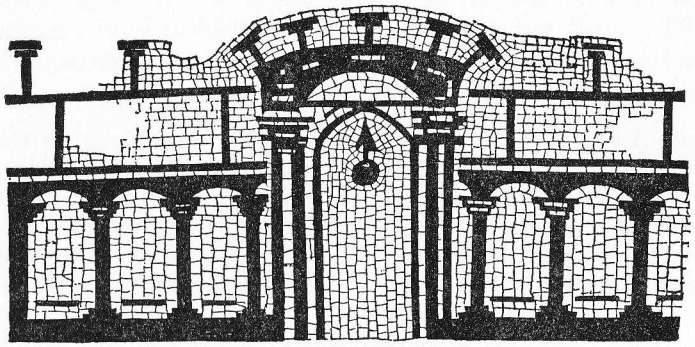
> Then Athene, Zeus' Daughter, made him taller to see and stronger, and down from his head she make the locks flow in curls like the curls of the hyacinth-flower. And as when a man overlays silver with gold, a craftsmen, wellskilled, whom Hephaistos and Pallas Athene have taught all manner of craft, and whose work, as he turns it out, is full of a grace, so the goddess shed grace on his head and his shoulders . . .

The *charis* shed by the goddess on Odysseus is a divinising power, and is seen as a gold-and-silver transformation. Alkman, describing a Spartan blonde, says there is a bloom as of gold on her hair, then goes on to tell of her silver face. Here there is a hint of divinisation, deliberately muted. The idea of the gods as gold-bodied is shown by the story of Pythagoras exhibiting his golden thigh in a theatre, and the way in which Alexandros of Abonoteichos, anxious to show himself as of the same lineage, equipped himself with a similar limb. When the gods supplied Pelops with a new shoulder, the spare part was of ivory; they could lend him only their own substances.[4]

The long-held idea of gold as a divinising, and to some extent transforming, substance does not in any way prove the existence of alchemy, but is certainly a necessary precondition. We come closer however when we meet schemes of history-periods linked with metals in a graded series; for here the grading assumes some

sort of hierarchy. Hesiod saw history as divided into the ages of gold, silver, bronze, heroes, and iron (the present dispensation). We may compare the Vision in *Daniel*:

> You, O king, saw, and behold a great image. This great image, whose brightness was excellent, stood before you; and the form of it was terrible. This image's head was of fine gold, his breast and his arms of silver, his belly and his thighs of brass. His legs of iron, his feet part of iron and part of clay.
>
> You saw till that a stone was cut without hands, which smote the image upon his feet that were of iron and clay, and brake these to pieces. Then was the iron, the clay, the brass, the silver, and the gold, broken to pieces together, and became like chaff of the summer threshing-floors; and the wind carried them away, so that no place was found for them; and the stone that smote the image became a great mountain and filled the whole earth.[5]



1. Mithraic mosaic of the Seven Gates at Ostia

Here the four metals represent the four ages that are to be brought to an end by the advent of the Kingdom of God, the rule of the righteous. There is clearly a stong Iranian influence. At the start of the *Bahman-Yasht* Zoroaster in a dream (or in two dreams) sees a tree whose metallic branches are explained by Ahura Mazda as representing the successive reigns of Persian kings.[6] The Magousaioi of Asia Minor, who combined Mazdean doctrines with Chaldean astrology, taught that the life of the world was divided into seven millennia, each under a planet and bearing the name of an associated metal. For six millenia the God of Good and the Spirit of Evil fought over the earth, till the Spirit established his domination and spread calamities all round. Zeus (Ahura-Mazda) decided to send Apollo (Mithras), a solar god, who would



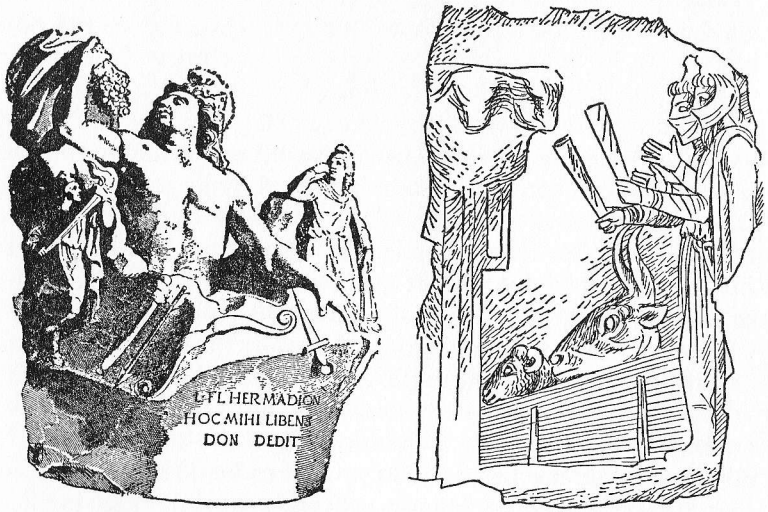
kill off the wicked with a torrent of fire, resurrect the dead, and establish a reign of justice and felicity. The Seventh Millennium, that of the Sun, would assure a happy Age of Gold. At its end the Sun-power too was ended, and all the domination of the planets; the Eighth Millennium brought about a general conflagration in which Fire took in and resolved the other Three Elements. Earth was renovated, all corruptibility gone.[7]

The link of ages and metals had penetrated also into Egypt. In a manuscript dated 2nd century B.C. we find the tale of a son of the king, Neneferkaptah, who persists in seeking the writings hidden in a nekropolis of Memphis as well as the *stelai* (stone-slabs) of the House of Life. One day, as he takes part in a procession in honour of Ptah, he meets an old priest who reveals the place where Thoth has secreted a book written in his own hand, which can tell how to master Heaven, Earth, Underworld, Mountains and Sea. The prince makes the journey needed for exhuming the book buried in seven coffers closed one inside the other—boxes made of gold, silver, ebony, ivory, another wood, bronze, and finally iron. He then has to fight a fantastic dragon. In this myth of initiation we meet the four metals of the Hesiodic ages combined with ivory, ebony, and another wood, to make up the planetary seven.[8]

The aphorism by Kratinos, with which we began, has a proverbial ring about it and so would seem earlier than the poet himself. In its light we may consider another proverbial turn of phrase, this time in Plato's *Republic*. A speaker asks impatiently, "Do you suppose we've come here to smelt gold and not expressly to hear discussion [*logoi*]?" That Plato did not invent the phrase, but was using a common idiom, is proved by its reappearance in the mouth of the orator Deinarchos, who declares in depreciation of someone, "He learned under the instruction of Aischines to smelt gold, not to do or suffer what was set before him." The idea of gold-smelting as something chimerical and fruitless is odd. *Chrysocheein* cannot mean "go prospecting for gold"; it means "carry on the craft of goldsmith", and *chrysochoeion* is a goldsmith's workshop, not a mine in any sense. The idea of goldsmelting as a fantastic occupation may have arisen from the smith sometimes taking for gold a substance that proved to be of base metal; but that it should have begotten a proverb suggests wider implications. The story told in the *Souida* to explain the saying is clearly a later rationalisation. The Athenian populace were said to have deserted all their usual work and rushed off to Mt Hymettos

where a heap of gold-dust had been found. The heap however was guarded by warlike ants. The populace, returning home, mocked at one another, "So you thought you'd go gold-smelting!" This tale, though failing to explain the origin of the phrase, stresses the fact that there was indeed a strong association of hare-brained schemes with goldsmiths.[9]

It is possible that fragmentary aspects of Mazdean thought filtered through to the Greeks long before the full systems were known. In any event we may suggest that the graded scheme of ages and metals presupposes some sort of link between the metals and cycles of the heavenly bodies. The first proof however that the outlook suggested by Kratinos' gold-lead antithesis had become connected with metallurgical or chemical experiment is to be found in the *Materia Medica* of Dioskorides, who, a native of Kilikia, seems to have flourished in the first half of the 1st century A.D., studying at Alexandreia and Tarsos, and serving as an army-surgeon. He described the roasting of stibnite to get the pharmaceutically-important white oxide of antimony; and like Plinius after him, he warned the practitioners not to carry the reaction too far lest the product "turn to lead". He also remarked, "Some record that




2. Mithras born from the rock, holding in his hand the grape which in the West replaced the haoma of the Persians; Mages on a relief at Daskylion, 5th century B.C.



mercury is a constituent part of metals."[10] Both natural and manufactured mercury were known to the Greeks and Romans; and Dioskorides described its production by distillation from cinnabar-ore. Plinius called it as "the eternal liquid, poison of all things". The early Greek name, *hydrargyros*, meant silverwater; the Latin term, *argentum vivum*, meant living-silver.[11] Dioskorides with his catalogue of some 600 useful plants was well known to the alchemists; we find extracts from his work following alchemic recipes. Here then we seem definitely on the alchemic trail.[12]

Plinius gives us the first record of an actual alchemic experiment. "Hope drew on the Princeps Gaius, who was most avid for gold, to order a great weight of *auripigmentum*, orpiment, to be cooked [*excoqui*]. The result was certainly excellent gold, but of small weight, so that he suffered loss." An operation such as cupellation was used to extract gold from metallic sulphurs which suggested gold by their colouring; there was as yet no clear distinction between the extraction of already-existent gold and the fabrication of gold from other materials.[13]

There is a striking alchemic image in the *Pumpkinification of Claudius*, written soon after that emperor's death, probably by Seneca. The poet is describing the Fates at work:

> Threads managed with a lucky hand change colour
> as there they twist. The Sisters gaze in wonder:
> the cheap wool is changed to precious metal
> and the Age of Gold descends on the lovely thread.

Here colour-changes, in textile dyeing, suddenly bring about a metal transformation; the movement up the colour-scale drives the whole process upwards so that gold is produced; and this transformation spreads out into the entire world. The poet is thinking of works like Virgil's Fourth Eclogue, where Nature takes over the work of dyeing and puts in its place a spontaneous colour-enrichment expressive of the Golden Age in which the sources of corruption, trade and luxury, have been eliminated and man is one with natural process; but instead of the redemption being simply the result of some Saviour's advent, it is here explained in terms of dyes and colour-changes in industrial process (spinning thread). The Saviour is indeed present; he is the young Nero ascending the throne; but the way in which the Golden Age is inaugurated is decisively different from the way in the Eclogue.

Manilius, the astronomical poet, refers to the alchemic process

of *diplosis*, doubling, of a quantity of precious metal. He is dealing with Capricorn and the sign's connection with Fire:

> Hence you influence arts and study. Whatever fire needs
> for its uses, demanding new flames for its works,
> under you is to be assessed.
> To seek out the hidden metals
> and buried riches, calcine the veins of earth,
> double matter with a sure hand by art,
> whatever is fabricated of silver or gold,
> what iron and bronze the burning smithies smelt [*solvant*]
> and the hearths of Ceres perfect, rise up your gifts . . .
> Hence too the mobility of things, and the changed mind
> often wavers.[14]

Note the link of *mobilitas* and change, *mutata mens*, with a liquid metaphor (*natat*, swims, wavers). A passage from the anonymous *Aetna* is also worth citing, not because it directly reflects alchemic methods, but because of the way in which it merges human and metallurgical processes. The earth is seen as being tortured like a man on the rack who is forced to tell his secrets:

> The seed of silver is sought, then a vein of gold.
> Bits of earth are flame-tortured and iron-tamed
> till they ransom themselves at a price. With the secret blabbed,
> they are silenced and left to beggary and contempt.[15]

As we shall see, the alchemists looked on their processes in just the same way as a sort of torturing, killing, and resurrecting of the life of matter. There is further perhaps a touch of alchemic thinking in the connection of gold with fermentation in a phrase from the *Satyricon* of Petronius: "She put a hundred gold pieces, *aurei*, into my hand. That was the leaven, *fermentum*, of my fortune, *peculium*." The gold is seen as doubling, increasing the money he owns. The old image of interest or profit as *tokos*, increase of progency, yields to a chemical idiom.[16]

From Plinius, Columella, and Seneca we gain strong indications that already a body of alchemic works had gathered round the names of Demokritos and the mage Ostanes. In Columella, a writer on agriculture, Demokritos appears as a prominent magician. He is cited with Mago and Virgil for the generation of bees from bullocks' carcasses, and is called a great sage who like Pythagoras was learned in the nature of the universe.[11] We shall discuss later the relation of the magician Demokritos



to the atomic philosopher writing under that name; for the moment we are concerned with his emergence in works of dateable authors. Columella writes:

> Demokritos in his book *On Antipathies* declares that these little vermin [caterpillars] are killed if a menstruating woman walks thrice round each bed with hair loose and feet bare. After that all the little worms fall to earth and thus die.[18]

Elsewhere, however, he brings out the fact that "Demokritos" is often an Egyptian writer, Bolos of Mendes:

> The celebrated writer of the Egyptian race, whose *Commentaries*, called *Cheirokmeta* in Greek, are published under the pseudonym of Demokritos, is of opinion that as a precaution against the disease [erysipelas] the sheep-hides could be often and carefully examined, so that if any trace of the disease is by chance found in any of them, we may at once dig a trench on the sheepfold's threshold, lay the afflicted beast on its back, inter it alive, then let the whole flock pass over the buried body. Thus the disease is driven away.[19]

Here we meet a passage-rite used to express or bring about the change from one condition or level of life to another; the disease is left behind as the other sheep are ritually reborn out of its dead body.

Plinius tells us that Demokritos was instructed in magic by Ostanes, and repeats that he was connected with the mages—though Solinus states that in his discussions he argued against them. Plinius adds that he violated the tomb of Dardanos to get magic books buried there, and himself composed magic books.[20] Seneca, contradicting the statement by Poseidonios that Demokritos invented the Arch, remarks, "It seems to have slipped your memory that this same Demokritos discovered how ivory could be softened and by boiling a pebble could be transformed [*converteretur*] into an emerald: the same process used even today for colouring stones amenable to this treatment." Plinius also speaks of works that taught the art of tinting artificial emeralds and other brilliant stones.[21] Whether the reference is to Demokritos proper or to Bolos is uncertain; and it is possible that works which Seneca and Plinius read as mere recipes of faking had a hidden alchemic meaning. What is clear is that the works of Bolos, whom we may take to be the founder of Graeco-Roman alchemy, were now quite familiar. Bolos (as Demokritos) is later

cited by Ailianos for the belief that lions did not sleep: "Demokritos says that alone of living beasts the lion is born with wide-open eyes." This notion was linked with that of the Lion as a symbol of the Sun.[22]

There was much activity of astrologers in the 1st century A.D. at Rome and elsewhere; and there seem many links between astrology and alchemy by this time. Tacitus mentions a Pammenes (the name is Egyptian) famed for the Art of the Chaldeans, who was expelled from Rome; there was also an alchemist Pammenes, described as the teacher of Demokritos in the art of goldmaking. George Synkellos, in a passage on Demokritos, says that Pammenes was blamed for expressing himself directly, not symbolically. He may have been the Egyptian Phimenas of Sais, to whom a recipe of Leyden Papyrus is attributed.[23] The astrologer Petosiris appears in Plinius, and Juvenal says of the superstitious woman: "She wants to drive to the first milestone, consults her book for the right hour. If her rubbed eye itches, she looks at her horoscope ere she takes a salve. If ill abed, she thinks the hour correct for food that Petosiris prescribed."[24] There was a genuine astrologer of this name, cited by Manethos, Porphyrios, Ptolemaios, Vettius Valens, and Firmicus; the last calls him "a most just ruler of the Egyptians and a very good astronomer". He and Nechepso, probably living in the 2nd century B.C., seem to represent an Egyptian system of astrology as distinct from that of the Chaldeans.[25] In an apocalypse he is described as hearing a Divine Voice that reveals to him the truth about the stars.[26] Plinius says that a theory handed down by Petosiris and Nechepso is still extant, called "the Theory of Numbers":

> For it divides up the Zodiac into groups of three signs. This theory shows it possible to attain 124 years of life in the region of Italy. These thinkers declared that nobody exceeds the ascendant measure of 90° (what is called Rising) and stated that the period itself may be cut short by the encounter of maleficient stars or even their rays, and by those of the sun.[27]

In alchemical MSS we meet a *Letter* from Petosiris to King Nechepso as well as an *Organon (or Sphere) of Petosiris* for linking a set of numerical calculations with the issue of maladies. There is also Petesis, priest and magician, who is called a King of Armenia. Petasios is named as the author of Demokritean



*Memoranda*; and the mage Ostanes addresses him. Petesis (Greek Isidoros) means Gift-of-Isis; both the Greek and the Egyptian forms of the name appear at the head of the MS of St Mark.[28] A treatise by Olympiodoros, is addressed to Petasios King of Armenia and mentions Petasios the Philosopher as if he were a different person. Zosimos mentions a Petesis as an alchemical contemporary of Hermes; and citations show him a follower of Maria's school.[29]

All this entanglement does not get us far. Both Petesis and Petosiris (Gift-of-Osiris) were common names; Petosiris appears as early as Aristophanes as a typical Egyptian. We can however infer a general connection of astrology and alchemy.[30] The formula, "Nature rejoices in nature, nature conquers nature, nature dominates nature," fundamental in alchemical theory, is to be found in Firmicus, where it may be taken as part of the Petosiris-Nechepso corpus: "One nature conquers another nature . . ." This summation of theory is certainly at least Hellenistic in its origin. It has been taken as a form of Stoic thought; and a scholiast tells us it was used by a "very ancient [Latin] poet", who may have been Ennius. For Ennius seems to have been acquainted with Pythagoreanism, another possible source of the phrase or at least a system congenial towards the thinking it reveals.[31]

For the later 1st and early 2nd century we have a passage from Epiktetos the Stoic (A.D. 50–130): "The power of the true staff of Hermes lies in the fact that it changes all that it touched into gold."[32] He is thinking of the true philosophy (*i.e.* Stoicism), but his metaphor shows that he is aware of alchemic claims to transmute metals into gold—and even more important, that these claims are associated with Hermes (Mercury). He may be thinking of Hermes as the great revealer of alchemy among other things, or of mercury the substance, or of both; but in any case his phrase is most striking and suggestive. We may also cite a passage from Ploutarch, in which he speaks of colour as a dye cast by light. He is discussing the moon and remarks:

> Whereas here below shady places in the neighbourhood of lakes and rivers, catching the sun, are dyed and made brilliant in robes of purple, yes, even of scarlet, and give forth many varied images of colour through the reflection of the light, what wonder is it if the vast flood of shadow, falling as it were into a celestial ocean of light, not stable nor at rest, but agitated by stars infinite in number and receiving mixtures and changes

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of all kind, should extract different colours at different times and give them out from the moon. A star or a fire would not in the shadow show itself black or glaucous or darkblue, but over mountains or plains or sea, many variations of colour from the sun come and go; and he casts the lustre of the dye, tempered with shadows and mists as with the hues of the painter's palette . . .

We can say that men did not look on nature in these terms—seeing mixtures and changes and a series of transformative dyes—before something of an alchemic climate of thought had developed. Ploutarch was also aware of the existence of processes to make materials appear golden. He speaks of (bronze or brass) vessels that "imitate the glow and the glittering of gold", and calls them "imitation gold" and "counterfeit metal". Such an attitude to alchemic processes is what we would expect from someone who knows of them only from the outside and lacks the clues which the practitioners kept secret or misleading in their recipes. Ploutarch further had learned of the association of the seven planets and the seven vowels found in Chaldean teachings, as well as the connection of certain letters and numbers.[33]

There is also a suggestive passage in the so-called *Meditations* of the emperor Marcus Aurelius in the mid-2nd century. He is in one sense expressing the old Greek idea of the continual breakdown of bodies into their component elements; but his terms show the effect of Stoic theory together with something of an alchemic idea of transformation. "There is to be seen in the things of the world, not a bare succession, but an admirable correspondence and affinity. Let that of Herakleitos never be out of your mind, that the death of earth is water, and the death of water is air, and the death of air is fire, and so on the contrary."[34]

The astrologic link of planets and metals was fully stated by Celsus in the *Book of Truth* against the Christians, in the later 2nd century:

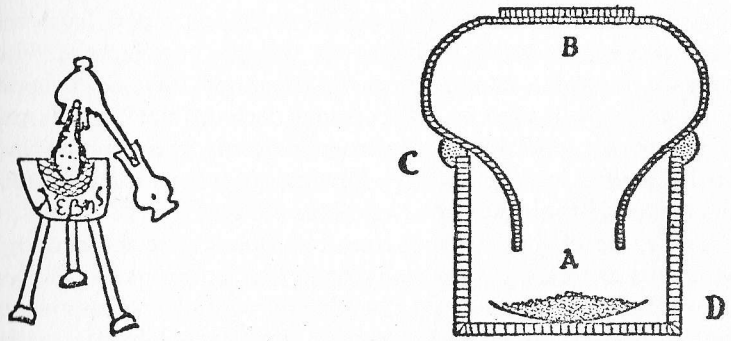
Those things are obscurely hinted at in the accounts of the Persians, and especially in the Mysteries of Mithras, which are celebrated among them. In the latter there is a representation of the two heavenly revolutions: of the movement of the fixed stars and of that taking place among the planets, and of the passage of the soul through them.

The representation is of the following nature. There is a ladder with lofty gates, and on the top of it an eighth gate. The first gate consists of



lead, the second of tin, the third of copper, the fourth of iron, the fifth of a mixture of metals, the sixth of silver, the seventh of gold.

The first gate they assign to Kronos, indicating by lead the slowness of this star; the second to Aphrodite, comparing her to the splendour and softness of tin; the third to Zeus, being firm and solid; the fourth to Hermes, for both Hermes and iron are fit to endure all things, and are moneymaking and laborious; the fifth to Ares because, being composed of a mixture of metals, it is varied and unequal; the sixth, of silver, to the Moon; the seventh of gold, to the Sun—thus imitating the colours of the two latter.[35]




3. The still of Demokritos and reconstruction of the mercury still of Dioskorides

The soul in its ascent was thought to give back the qualities it had absorbed at each stage of its descent. Thus each halt was a sort of transmutation in terms of the relevant metal; after the seventh change came the absorption into the luminous bliss of the eighth sphere. Having come down from Ormuzd's presence by the low gate of the Crab, the soul went up by the lofty gate of Capricorn.[36] This creed was popularised by Noumenios of Syria, a thinker much esteemed by the Neoplationists and by Origen.[37]

In the Mithraic Mysteries the ascent was expression by the initiations into each of the seven stages, with rites, sacraments, ordeals reflecting the tests and judgments of the soul after death, beginning with the trial before Mithras. In the Mithraion of the Seven Spheres at Ostia, seven gates were depicted in mosaic on the central floor; in front of the reclining-benches were shown the planets, and on the borders of the podia the signs of the zodiac. In that of Felicissimus the symbols of seven grades appeared in mosaic on seven floor-panels of the central aisle; on

the eighth panel was a vase surrounded by twigs. In that of the Seven Gateways at Ostia, straight behind the entrance, a black-white mosaic of the central floor showed a large pinnacled gateway flanked on each side by three smaller gates; and again the seven planets were added.[38] Seven played a key-role in the rites. The cultniche at Dura-Europos was reached by seven steps. A crude relief (now at Mannheim) showed a big snake turned to a vessel; by it a priest, probably a Father, made a libation in a *krater* (mixing-bowl) on a small altar, with a dog, Mithras' faithful companion at his side; a row of seven small altars were also depicted. In Danubian reliefs seven cypresses (sun-trees) were shown alternating with seven daggers, on each of which hangs a Phrygian cap. A *terra-sigillata* bowl, on which appear lion, vase with serpent, raven, and cock at the sacred meal, seems to set out the four elements (water, vessel; fire, lion; earth, snake; air, bird). The Persian mages revered the four elements and took care not to pollute them.[39]

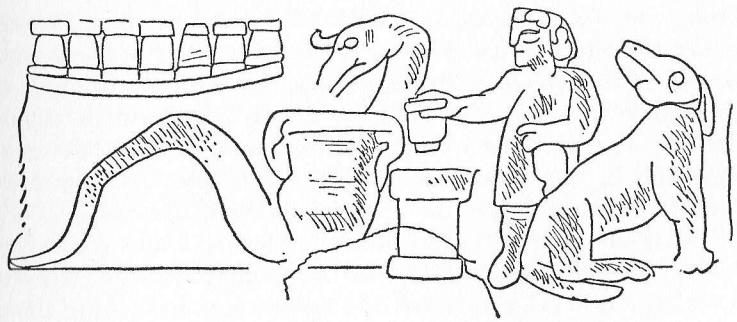
The three Mithraic crypts found at Rome near the church of Santa Prisca deserve a special word. The paintings on the long side-walls give glimpses of the liturgic formulas accompanying the rites. Each grade is once more represented by its tutelary planet; and in one scene the six lower orders pay homage to the seventh, that of the Fathers, using the formula: *Noma Patribus. Noma* is an Iranian borrowing, so that the meaning is: "Glory to the Fathers." Another scene shows a procession of six lions, while on the grotto's left side we see the Feast of the Sun and Mithras. Verses have been added on some of the lower levels. Above the communion-scene the verses conclude: "Accept also these Boughs, Holy Father, accept the Lions, through whom we give incense, though we ourselves are consumed." The incense has been taken as meant to purify the air and chase demons away; but it seems clear that Lion, Incense, Fire, Bough were all linked, even identified. A holocaust with incense-burning symbolised the sacrifice and burning of the initiate; the offerer of the sacrifice was also himself the victim, who died to be reborn. The rite thus expressed a fire-transmutation, turning the initiate into sun-gold.[40]

We have noted the sevenfold division of time by the mages, with each age owning a planet and a metal. Origen carried the imagery into Christian thought, likening history to a ladder up which men climbed. The first steps were in time and space, where



events lead up to the Mysteries and to the hidden meanings accessible only to those who scale the towering heights.

Although to draw in material here from the Gnostic and Hermetic systems is rather like trying to explain the obscure by the even more obscure, it will perhaps be useful to point to the part played by Hermes-Mercury in the soul-ascent. Hermes, the ancient soul-guide into the underworld, was given a celestial role with the swing of popular belief from the dark realm of Hades below the earth as the site of the afterlife, to the bright spheres of the star-world.[41] Ploutarch sees the Heavenly Hermes as the patron of the Second Death, *synoikos*, *contubernalis*. On the tombstone of a sailor at Massilia we read: "Among the Dead there are Two Companies. One moves on earth, in *aither* the other goes, among the dance-groups, *choroi*, of the stars. The second is mine; for I have gained a god as guide." An epigram of the 1st century A.D. declares: "Wingfooted Hermes took your hand and led you on high to Olympos and set you to shine among the stars of the sky."[42] The acquisition of Hermes as guide implied some sort of mystery-initiation. In a Mithraic catacomb on the Appian Way Hermes-Mercury leads the initiated before Hades and Persephone (Pluto and Prosperpine). Here, though in the service of astral religion, he reasserts his underworld-image; but he has to point upwards. Under Egyptian influences the Sun in his Boat also became the death-guide. Near the end of Julian's satire on the Caesars everyone is told to select his "guardian and leader", and



4. Relief of priest of Mithras (now at Mannheim); row of seven small altars and a huge snake turning its head to a big vessel by the altar where the priest, possibly a Father, offers a libation in a krater, while the dog, faithful companion of Mithras, sits at his side

Julian is advised by Hermes to turn to the Sun: "Keep his commandment and thus procure yourself a cable and sure anchorage in life, and when it is necessary to depart from this world, with fair hope you'll find him a leadergod propitious to yourself."[43]

An Hermetic tradition links crafts of metallurgy, dyeing, and so on with the Fallen Angels. The Christian form appears in Tertullian:

> Those indeed who first devised these things are held to be damned and sentenced to the penalty of death. For they were the angels who fell from heaven upon the daughters of men and thus added fresh shame to womankind. Certain substances well-hidden and many parts not well revealed they then first brought out into the light for the benefit of an age much less skilled than ours. They laid bare the working of metals, they divulged the qualities of herbs, they made known the power of incantations, they directed curious research even to the interpretation of the stars.
>
> But, as a special and as it were peculiar gift for women, they offered them the instruments of female pride. They brought the flashing stones that give to necklaces their varied hues, the golden bracelets claspt about the arm, the artificial dyes that add colour to white wool, and even the dark powder that enhances the effect of eyelids and eyelashes.[44]

He asks sarcastically if it was God who showed men how to dye wool with herb-juices and shellfish-spit. "He perhaps forgot when bidding the universe come to birth, to order purple and scarlet sheep?" The Fallen Angels were the ones who "betrayed the secret ways of sin, delivered up gold, silver, and their works, and among other things taught the art of dyeing fleeces". He lists among those who have had their arts revealed by these Angels, "astrologers and haruspices and augurs and mages". He merges the Fall of the Angels with the Expulsions of the Astrologers or *Mathematici* from Rome. "They are driven out like their angels. The City and Italy are forbidden to the *mathematici* as heaven to those angels, the same penalty falls on disciples and masters." (An odd identification of the imperial City with Heaven!)

Similar views appeared in Gnostic, Hermetic and Apocalytic writings. In Gnosticism the virtue of moving from Ignorance to Revealed Knowledge or *gnosis* is at times opposed to the sin of turning instead to evil lores or forbidden *gnosis* that ties the quester more tightly in the snares of flesh. *The Universe Maiden* or *Korē Kosmou*, comments on the "meddling audacity" in the restless movement of souls, and the same phrase is used of men.



> "They seek what nature conceals in the depths of inaccessible sanctuaries. They pursue reality up to the heights, avid to learn by their observation what is the established order of celestial movement."[45]

We meet here the theme of the search for hidden records of divine lore, which we have already met in the tale of Neneferkaptah and in the tradition that Demokritos violated the tomb of Dardanos for magic books. Firmicus speaks of "whatever of the divine the ancients brought forth from the Egyptian sanctuaries", and Loukian in a supposed account of an incarnation as Pythagoras:

> In brief I was a sophist; for I must tell the truth, I take it. However, I was not uneducated or unacquainted with the noblest sciences. I even went to Egypt to study with the prophets, penetrated into their sanctuaries, and learned the Books of Horos and Isis by heart. Then I sailed away to Italy and worked on the folk in that quarter of the world so well that they thought me a god.[46]

The theme of the ancient book or *stēlē* is embedded in early alchemic accounts; and we shall hear more of it. But some further examples may be cited here. Euhemeros, the Hellenistic romancer from Sicily, narrates how he found in the Red Sea, on the Isle of Panchaia, a *stēlē* hidden deep in the temple of Zeus Triphylios; on it were engraved the Deeds or *Praxeis* of Ouranos, Kronos, and Zeus, by Zeus' own hands. The aretologies of Isis from Kyme, Andros and Ios, all announce their derivation from a *stēlē* in the temple of Ptah-Hephaistos at Memphis; and Diodoros gives the same origin for a stele he purports to cite from Nysa in Arabia.[47] The author of the *Axiochos*, in the last century B.C., refers to a revelation of the mage Gobryes on the fate of souls; the mage's grandfather, after Xerxes' expedition, had found two inscribed bronze tablets at Delos, brought from the land of the Hyperboreans.[48] To support his myth of souls in the moon, Ploutarch cites ancient sacred parchments found at Carthage, which "after the destruction of the first city, were secretly carried off, and, without anyone knowing, were left a long time in the earth".[49] *The Potter's Oracle*, after being dictated to the sacred scribe, before the king and the priests, by the prophet in a state of trance, is deposited (the account runs) at Amenophis' orders in the sacred archives of Heliopolis, where all may consult it.[50]

Astrologic manuscripts have similar tales. Sacred scribes of

perfect wisdom, *pansophoi*, under King Psammetichos wrote a *lunarium* in hieratic script, which was deposited in the holy-of-holies of the temple of Heliopolis and long after discovered. We hear also of a Royal Book put into a ship, miraculously saved by the gods, to reach the Trapezoutik Coast, wherever that may have been.[51] The astronomer Ptolemaios falls back on a story of an ancient roll, apparently to give prestige to his system:

Recently we have come on an Ancient Manuscript, much damaged, which contains a natural and consistent explanation of the order and number [in Egyptian nativities]; and at the same time the degrees reported in these nativities were found to agree with the tabulation of the ancients. The book was very lengthy in expression and excessive in demonstration, and its damaged state made it hard to read, so that I could barely gain an idea of its general purport. That too, in spite of the help offered by the tabulation of the terms, better preserved because they were placed at the end of the book.[52]

The *Kyranides*, a kind of Hermetic Bestiary, also uses the fiction of the sacred book. In the original prologue (preserved in a Latin text that holds an earlier tradition than the Greek manuscripts) we read: "This book was engraved in Syriac letters on a column [or *stēlē*] of iron." The more expanded account of Harpokration runs thus:

I happened to encounter an old man very learned in foreign and Greek literature. He called himself a Syrian, but he had been made captive and remained there [at Seleukeia on the Tigris or a town nearby]. This old man then made me go with him all round the town and he showed me everything. Arriving at a spot some 4,000 [paces] distant from the town, we saw, near a large tower, a column that the people of Syria [Assyria] said had been brought and set there for the health and cure of the townsfolk.

On scrutinising it closer, I saw that this column bore an inscription in strange letters. The old man, on being questioned, soon agreed to explain the matter to me, and I listened to his account of the column as well as the translation that he gladly made into the Aiolic [Greek] tongue from the barbarian script.

"You see," he said, "my son, the disposition of these three towers, one which is 5,000 [paces] away, the other, 2,500, the third, 4,000. They were built by the Giants when they wanted to mount to the heavens. It was because of this impious folly that they were struck by lightning or stricken with madness for the rest of their days by the Judgment of God —or else, God, in his wrath, threw them into the island of Crete."



The old man, who showed me these matters, bade me measure with a cord the height of the stone. I worked out then the nearest one and found it 32 cubits high, 78 wide; it included a staircase of 208 steps. We saw also the sacred enclosure, in the midst of which there was a temple with a staircase of 365 steps in silver and another of 60 steps in gold. We ascended them to offer up prayers to God, while the old man revealed to me mysteries of the divine power that it isn't fitting to retell.

As for me, despite my wish to know more, I set the rest aside for later on, and inquired only about the column. The old man then, lifting up a covering of byssos, showed me the inscription in foreign letters. As he knew the language, I begged and implored him to explain the text, without evasions or jealousy. Here then is what he read out from the column.[53]

"Without evasions or jealousy" is an Arab touch. From Al-Razi on, the Arabs distinguished allegorising alchemy from the practical side, and we find a pride being taken at times in setting out plainly what has been left hidden. The author of *The Aim of the Sage* states that he penetrated the secrets of the hieroglyphic texts engraved on Egyptian temples so as to show that he was not "envious" like the (Greek) ancients.

The *Golden Compendium* of Flaccus Africus, which declares itself a compilation extracted from the *Kyranides*, tells the same sort of tale as Harpokration, but substitutes tomb for sacred column or *stēlē*:

Flaccus Africus, disciple of Belben, to Claudius of Athens the Calculator (?), good continuation of studies and good success in research.

After the books of the ancient *Kyranides*, which are known to you and which are attributed to your colleague Harpokration, I have discovered in the town of Troy, hidden in a Tomb with the bones of the first king Kyranos, this little work entitled *Compendium of Gold*, because it is a summary of extracts, made with care, from the more important work of the *Kyranides*.[54]

Kyranos, though buried at Troy, is meant to be a Persian king. Books were said to be found also in the tombs of Kleopatra, Alexander, Hermes Trismegistos. According to the Arabs, Hermes (the first one, living before the Flood) built the pyramids to deposit in them all the secrets of knowledge before the world was destroyed by cataclysm, by water and fire. Then he and

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Agathodaimon were later buried there as well. Belben, of whom Flaccus calls himself disciple, seems the sage Apollonios of Tyana, the Balinas of the Arabs.

Finally we may note in magical papyri:

> Sacrifice of perfumes to Moon, of Claudianos. This very book, property of the Dozen Gods, has been discovered at Aphroditopolis [in Egypt], near the Very Great Goddess Aphrodite the Heavenly, who embraces all the Universe.
>
> [Prayer to Hermes] Your true name is inscribed on the sacred stele of the *adyton* at Hermopolis, there where you were born . . .
>
> Great is Lady Isis! Copy of the Sacred Book discovered in the Archives of Hermes. It is the Method dealing with the 29 letters, thanks to which Isis with Hermes found her brother and husband Osiris, whom she was seeking. Invoke Helios and all the Gods of the Abyss on the subject of the things about which you desire to get a Sign. Take a male palm 29 leaves, inscribe on each leaf the names of the gods, and, after saying a prayer, lift the leaves two by two. The remaining leaf, the last, read it and you'll find your sign relating to what interests you, and you'll have the revelation quite clear. . . .
>
> [A scare-spell of Solomon, "effective both for children and for adults"] Come to by the intermediary of this man or this child, so and so, and enlighten me with precision, for I pronounce your names which Hermes Trismesgistos has engraved at Heliopolis in hieroglyphic characters. . . .
>
> We have composed this moonbook by putting two small books together: one is in the hand of the sacred scribe Melampous, addressed to Nechepso King of Egypt, the other has been found at Heliopolis in Egypt, in the temple, in the holy-of-holies, engraved in hieroglyphics under King Psammetichos . . .
>
> Explanations given according to the temples, in use among the sacred scribes. Because of the evil curiosity of the vulgar, they engraved the names of plants and other magical instruments on divine statues, so that no one, without the necessary precautions, might meddle indiscreetly in magic, because of the errors that then resulted. We however give the solution, drawn from a large number of copies and secret writings of every kind . . .[55]

After this glance at secret and sacred sources, we may turn back to the theme of forbidden knowledge. The *Kore Kosmou* tells further how God warns the souls not to commit any act of revolt —or else "by my sacred breath [*pneuma*], by this mixture [*krama*] out of which I have created you, and by these soulmaking hands, I won't be long in forging chains and penalties for you." But:



> After taking what had been mixed of matter, my son Horos, at first they sought to understand it, then they worshipped the mixture, work of the Father, and asked themselves of what it was composed. That wasn't easy for them to recognise. Then indeed, as they were given up to this very research, they were overcome with terror of encountering the Father's wrath and they set themselves to carry out his will.[56]

The apocryphal *Book of Enoch* (middle or end of 2nd century) lays down that the source of human sin is the forbidden knowledge taught to men by the angels overcome by love of women. In their heavenly homes the angels knew no women, but now they instilled into the daughters of men their own spirit of darkness, with which they gorged themselves before coupling. They poured out all the hidden things: "*pharmakeiai* [drugs or charms] and spells and root-gatherings", and they disclosed the lore of herbs. "Others revealed the workings of metals and precious stones, the dyeing art, and the use of spells, astrology, *semiotika*, star-watching, moon-leading." *Semiotika* means Signlore; probably here it refers to the art of interpreting the sky, but it could also refer to the medical art of diagnosis. George Synkellos writes of "the signs [*semeia*] of the earth, the signs of the sun, the signs of the moon". In *Enoch* these pursuits beget a great impiety; the women bear giants to the angels; the giants devour human beings—and probably through their example men learn to eat flesh. Men appeal to God, who announces a day of judgment. Similar ideas appear in the Hermetic *Asclepius*, in the Egyptian Gnostic works from Chernoboskion, and in the Clementine Homilies (probably 4th century).[57]

*Enoch* is of interest also as connecting the scheme of planetary metals with creation. The heavens are regarded as made of mountains of metals: "Then my eyes saw all the hidden things of heaven that shall be, an iron mountain, and one of copper, and one of silver, and one of gold, and one of soft metal, and one of lead." Elsewhere we hear that silver and soft metal come from the earth; lead and tin from a fountain by which an eminent angel stands. Also there are Seven Mountains of Magnificent Stones, each differing from the other. and "Seven Mountains full of choice nard and aromatic trees and cinnamon and pepper." As for creation:

> And then I made firm the waters, that is the depths, and I surrounded the waters with light, and I created Seven Circles and I fastened them

like crystal, moist and dry, that is to say, like glass and ice, and as for the waters and also the other elements, I showed each of them their paths, to the Seven Stars, each of them in their heaven, how they should go.

This glance at hermetic and gnostic writings, which can generally be dated of the 3rd century, has not given us any sure links with alchemy; but it has helped us to feel something of the atmosphere of the period, of the spiritual and intellectual climate when the work of Bolos of Mendes was having its effect. The references to *baphika*, dyeing processes, among the forbidden arts, perhaps provides a link with the alchemic world. Thus, the fourfold division of tinctures (gold, silver, precious stones, purple), which we find with Bolos, is in effect found in *Enoch*. "The angel Azael taught men how to forge swords and he made them recognise the metals and the art of treating them . . . , precious stones of all sorts, and tinctures." If we look at the two important chemical papyri, we find the first (Leyden) deals with dyeing of gold and silver, the second (Stockholm) with dyeing precious stones and stuffs. Ancient alchemic treatises at times have the names of *Physikai Baphai*. The fragmentary work of Bolos is given no title in the MSS, but it probably was *Baphika* or *Books of Physikai Baphai* or merely *Dyeing Books* (*Biblioi Baphikai*).[58] And when we look more closely at the cosmogonic pictures of the hermetic writers we feel yet closer to the alchemists. Take the opening of the *Poimandres*. One day, as the narrator meditates, he falls into a sort of trance—as if all his senses were bound: "as happens to those overwhelmed by a heavy sleep after eating too much" or by extreme fatigue. He has a vision of a huge person, who announces himself as Poimandres, "the *Nous* [mind] of the *Authentia* [absolute power]". The dreamer says, "I want to be instructed as to beings, understand their nature, and know God. O, how I wish to hear." Poimandres bids him remember all that he is told.

At these words, he changed in aspect and suddenly everything opened before me in a moment and I saw a limitless vision, everything become light, serene and joyous, and at the sight I was smitten with love. And a little afterwards there was a darkness showing up below and coming in its turn, fearful and sombre, which rolled in tortuous spirals like a snake, as it seemed to me. And this darkness changed into a sort of liquid nature, shaken in an indescribable manner and exhaling a vapour such as comes from fire and producing a sort of noise, an unspeakable



groaning. Then there jetted from it a voice of appeal, without articulation, such as I compared with a voice of [fire].[59]

The imagery seems strongly alchemic; we see an experiment of boiling liquids, of smoky exhalations, of spiralling vapours. Earlier demiurges put the elements together in direct compositions; work like carpenters or potters; compute like geometers or mathematicians. But here God is working as a chemist. We get the same sort of alchemic god in the *Korē Kosmou*.

As he wanted the upper world to be no longer inert, but had decided to fill it with *pneumata* [spirits], so that even in detail it might not remain motionless and inactive, he began to play the Artisan [or, to carry out the Art, *Techne*], using sacred substances for the production of the work.

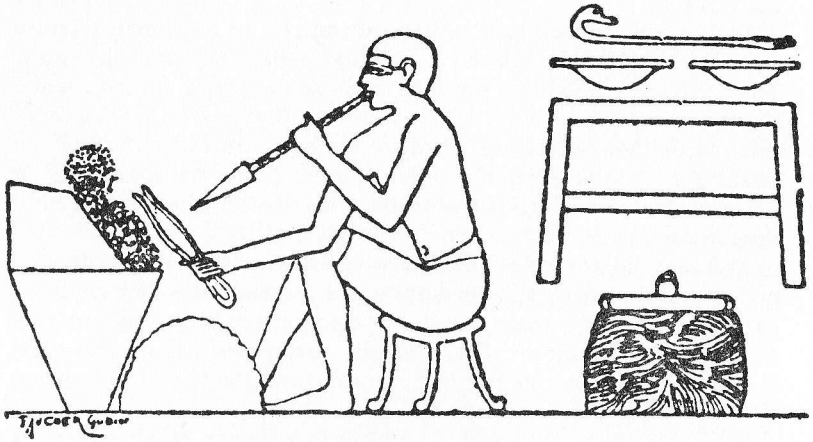
Taking from himself sufficient *pneuma*, and by an intelligent mixture uniting it with fire, he brewed it up with certain unknown substances. Then, having unified this product, each element with another, while accompanying himself with certain secret incantations, he very strongly agitated the whole mixture, till there boiled up to the surface of the mixture a sort of matter, subtler, purer, more transparent from the ingredients of which it was made. This was translucent, and only the Artisan saw it.

And as it did not melt in the heat when it was drawn out of the fire, nor grow cold when completed out of the *pneuma*, but fully kept, in its particular and appropriate nature, the composition of the mixture that formed it—composition that precisely, basing himself on the most favourable name and the fact that it acted comfortably with this name, God called *Psychōsis* [Animation].

From this crust God made to be born in adequate number myriads of souls, fashioning for his design with order and measure, as a worker of experience and in fitting propertion, the foam issued from the mixture itself, so that there was not the least difference between the souls more than was necessary: taking into consideration that the foam frothing to the surface after God had done his stirring was not everywhere the same. The first layer was better and denser than the second, and altogether purer; and the second layer, inferior enough to the first, was still much better than the third. And so on till the sixtieth rank of souls completing the total number.

God established by a law that the soul would all be eternal since they came from a single substance that he alone had known how to bring to perfection. And he assigned them sections and depots in the heights of the celestial nature, so that they might turn the cylinder according to a determined order and a suitable disposition, and might make their Father rejoice.[60]

The turn to a geometrical form, the cylinder, at the end comes as a jarring note after the fluid chemical idiom of the preceding parts, which describe the processes transforming spirit into individual souls, *pneuma* into *psychai*. These passages from *Poimandres* and *Korē Kosmou* are highly sophisticated and do not suggest rough sketches by some tyro at an alchemic type of cosmogony. How far back did the type go? We have a valuable clue in the Ptolemaic creation-myth set out at the entry of the great hypostyle hall at Karnak. There Ptolemaios VII (Euergetes II), 145–116 B.C., in his dedications on the second Pylon, covered with reliefs in his own image the face of the gate, which seems to have been previously undecorated; and he remade the reliefs of Ramses II on the



5. Ancient Egyptian goldsmith at crucible

southern wall of the window-opening. The operation can thus be described as a fresh consecration in his name. Cosmogonic ideas are given a new form. "He made it [Thebes], he created it, he cooked it with the Flame of his Eye as Land on the Water's edge. He [still] gives so that it rejoices in the heat of his Uraeus, great-of-flame."[61] In the hymns of the Leyden papyrus going back to Ramses II we read, "Water and Earth were in it [Thebes] at the beginning. Sand came to establish a territory, to constitute a soil. When that emerged, the Earth was." There, as in *Genesis*, we find expressed a division or separation-out of the two elements, nothing more. And we find this idiom still repeated in Ptolemaic days, e.g. "You are the Sand . . . from which was taken to create



the Two Lands." A halfway house, it is true, may be found in the Ptolemaic texts at Medient Habu on a little temple consecrated to the primordial gods of Thebes. There we are told that Amun-Re made the light shine in the darkness and (made?) every day and every night; he shone on the waters and the earth was in darkness; all the universe was in the liquid abyss; by the light he produced dryness; and organised everything; at once the father and the mother of the gods, he ordered the return of the sun after each setting . . . ; he made the sky for his soul's cradle, and the *akhet* (horizon) hides his person. Here we see the heat of the sun's rays used to explain the drying-out process; and we can attribute the reasoning to a general growth of rational thinking, which sought for as natural an explanation of phenonema as possible; there seems no need to invoke a Jewish influence, that of *Genesis*.[62] However, we go much further when the action of the sun's rays is supplanted by that of a cooking process. We then move from a natural process to one derived from human techniques. The account given by the historian Diodoros of the world's origin in the last century B.C. shows a link with the Karnak text rather than with Greek cosmogonies. Thales seems to have taken over the earlier Egyptian notion of a primitive cosmos of water, out of which the earth merely emerged in division to float like a raft. Anaximandros had a more elaborate system in which fire or heat played its part in bringing about the separations of the elements; but the movements involved are wholly mechanical. Diodoros on the contrary shows definite if sketchy chemical notions. First was a primal unity; then came the separatings-out.

> The air gained the power of ceaseless motion; and as it is light and buoyant by nature, the fiery part of it gathered into the highest regions, with the result that the sun and other heavenly bodies were caught up in the total whirl [*dinē*]. Meanwhile the slimy muddy part, with the condensation of the wet sections, settled by reason of its weight at the bottom. Then, stirred up and churned over continually, the wet parts formed the sea, while the more solid parts became soft muddy soil. As the sun's fire shone on the land, the latter became first of all firm; then, as its surface was in a ferment because of the warmth, portions of the wet swelled up in masses in many places, in which pustules covered with delicate membranes made their appearance. Such a phenomenon may still be seen in marshland when very hot air passes suddenly over frozen ground. From these, living creatures were generated by the heat.[63]

And so on. Diodoros was much interested in Egypt and its thought. The source of his imagery must be sought in the Egypt of his day, in the intellectual circles of Alexandreia rather than in earlier Greek philosophy. The Karnak text and his formulations do not look back; they look forward towards alchemy. At Karnak we meet the notion of boiling; Diodoros adds fermentation; and a further stage appears in an hermetic fragment from the *Discourse to Ammon*:

> The Nature of the All supplies the All with Two Movements, the one according to the power [*dynamis*] proper to it, the other according to activity [*energeia*]. One penetrates throughout the whole world and maintains it from within; the other is coextensive with the world and envelops it from outside. And these two movements go and come together throughout all things.
>
> The Nature of the All, bringing to birth the things which come into being, gives the facility of growing to all that is born, on one side sowing its own seeds, on the other side having a mobile matter at its disposal. Once moved, matter warms itself up and becomes fire and water, one full of vigour and force, the other passive. Fire, opposed to water, dries up a part of it, and thus is formed the earth floating on the water. Water continues to be dried up all around, and so there is disengaged from the three [water, earth, and fire] a vapour. Thus is born the air.
>
> These elements have entered into combination according to the harmonic relation, and, of their own accord, there is a born a *pneuma* and a seed analogous to the enveloping *pneuma*. This *pneuma*, once fallen into the womb [or matrix] does not remain inactive in the interior of the seed. And as it does not remain inactive, it transforms the seed, and that, by this transformation, acquires growth and size.[64]

Here we see various Aristotelian formulations in the process of change under pressure from Stoic ideas, which introduce the idea of *dynamis* penetrating all things and thus vitally linking them. As part of this more active conception, the Aristotelian mixtures and dissolutions of the elements cease to be merely a matter of arithmetical proportions—the harmonic relation; they take on a chemical aspect, or at least are explained in terms of heat-processes and organic changes. This passage perhaps gives us a clue as to the way in which Stoic notions of *pneuma* helped to break down the old abstractions and make men search out dynamic and organic lines of explanation for phenomena. By the 6th century we find Simplikios, the last Neoplatonist, stating, "Matter is always truly



the last sediment. Hence also the Egyptians call it the dregs of the first life, which they symbolically denominate water, matter being as it were a certain mire." Perhaps we can recognise a sort of confused transition between the old and the new attitudes in the creation-formulas in magical texts, *e.g.* a spell to be said over dogbites: "Hear these words of Hor who smothered the heat, who has descended to the eternal waters and cast a solid foundation to the earth." It is not clear there, however, if the heat-smothering brings about the emergence of the earth.[65]

Attempts have been made to explain the Karnak text as the result of ideas of Ionian Presocratic philosophy intruding on the Egyptian world in the 6th century B.C. and spreading with Greek influences under the Saite kings. This however is a most implausible explanation for a 2nd-century text; it is much more natural to look to contemporary Alexandreia for the place-of-origin of the new ideas. In any event, as we noted, early Greek philosophy does not show any impact of cooking or smelting processes. Such an impact does not arrive till the 4th century B.C., when Aristotle remarks, "Techniques are a copy of nature; it is all the same whether the processes take place in kitchen utensils or in the organs of plants and animals."[66] Biological science is beginning, with attention paid to processes of organic growth. The verb which Diodoros uses to express the earth in fermentation seems first used by Theophrastos in dealing with plants.[67] A big advance was being made; but it took the Stoic concept of *pnenma*, of pervasive tensions in the whole universe, of unifying fields of force, to provide an effective system in which to incorporate the new approaches. Processes of cooking or boiling and processes of brewing or fermenting were among those which laid the basis for alchemy. Their intrusion into the thought of the 4th century B.C. thus represents what we may call proto-alchemy in its first phases.

Diodoros' account of the effect of the sun in producing minerals is also worth citing; for it uses the imagery of dyeing or tincturing which was playing a key-part in the alchemic concepts. Thus, rock-crystals "are composed of pure water hardened, not by action of cold, but by the influence of divine fire, and thus they are never subject to corruption, and they are dyed many hues when breathed on". Smaragdi (probably emeralds) and beryllia (diminutive of beryl), "found in the shafts of coppermines, get their colour from being dipped and bound together in a bath of sulphur".

Chrysolites "are produced, they say, by a smoky exhalation due to the sun's heat and thus get their colour. So what is called false-gold, we are told, is fabricated by mortal fire, made by man, by dipping the rock-crystal into it." Dark red stones have been made by greater compression of light; and the colours of birds and flowers, as well as the smells of the latter, have been brought about by effects of the sun similar to those begetting the coloured stones.[68] A chemical idiom drawn from dyeing has been imposed on the Aristotelean conceptions.

# 3

# More Historical References

We have now reached the period when alchemy was venturing more in the open. One aspect of the alchemic climate of thought is the way in which colour is more and more seen, not as an incidental quality of objects, but as an integral part of their nature. We saw that kind of idea becoming strong in Ploutarch. We find it again in Plotinos, the great Neoplatonist of the later 2nd century. Colour is felt to be an essential quality thrown out by a centre of life or power. "That light known, then indeed we are stirred towards those beings in longing and rejoicing over the radiance about them. Each one of them exists for itself, but becomes an object of desire by the colour cast upon it from the Good, source of those graces and the love they evoke." Here the colour is viewed as an expression or revelation of the qualities embodied in the being, its power of dynamic attraction. "As soon as the glow from above has pervaded it, the soul gathers strength, truly spreads its wings," and rises in quest of the higher object. The *psychē* is itself like gold covered with dirt. That is, it owns the highest constellation of qualities, but has to regain or liberate these from a contamination or overlaying by matter of a lower level.[1]

Some elements of these positions go very far back. We are reminded of the Homeric passage where divinising gold and silver are shed as a *charis* or grace on the hero. But what had once been an unstable intuition has now become part of an elaborate and thoroughly worked-out system of thought. Many ingredients have gone into this system—Pythagorean, Platonic, and Stoic; but to the Stoic concept of pervasive tensional force has been added ideas drawn from alchemy: the idea of a hierarchical system of levels in matter, with gold as highest level, expressing complete stability and inner harmony. There is an interesting phrase in Loukian's account of Peregrinos' self-immolation by fire at Olympos: "he

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hoped to be set up golden." The verb used, *anistēmi*, can mean both "set up a statue" and "resurrect from the dead".[2] And we may note the phrase in Latin "to have a gold beard", meaning "to be a god".[3] The origin here however seems to lie in the days when Roman looters came up against the ivory-and-gold techniques of Greek statuary.

Further, in an argument about Matter, Plotinos makes a direct reference to alchemy, assuming the possibility of both an upward-transformation into gold and a downward one into water:

> . . . Corruption is of that which is composite. But if this be so, each sensible thing consists of matter and form. This too witnesses induction, demonstrating that the thing which is corrupted is a composite. Analysis likewise proves the same thing: as if, for instance, a pot should be resolved into gold; but gold into water; and the water being corrupted will require an analogous process.

The views of Plotinos about gold and dirt can be found also among the Valentinian Gnostics, who divided men into *pneumatikoi*, who possessed *gnosis*, and animal, who were merely bound to obey the moral law. The men of *pneuma* could take no harm from the world any more than gold lost its essential quality when dipped in excrement.[4] Iamblichos, a Neoplatonist around A.D. 300, linked the theurgic art or *technē*—the art of controlling the gods or divine force in various ways—with the discovery of "suitable receiving instruments". The art thus "often connects together stones, plants, animals, perfumes, and other sacred objects, perfect and divine, and of all this makes a perfect and pure receiver". He says:

> The custom that invokers have of bearing stones and herbs, of binding certain sacred bonds and unbinding them, of opening what is closed and of changing the intentions of those who receive the god, by making them praiseworthy instead of harmful, as they were—all this shows well that the *pneuma* comes from outside.[5]

These passages must be read in terms of the thesis of sacrifice he is setting out, according to which the fire suppresses and also assimilates the matter of the offerings, transforming it upwards inside a hierarchical system. He discourses on

> the offerings of sacrifices by fire which devours their matter and suppresses it and assimilates it without being assimilated. For this offering leads to the divine fire, celestial and immaterial, but is not dragged down by its weight to below, in the direction of matter and generation.



> If there were some pleasure or joy coming from the vapours of matter that charms the *daimones*, matter would remain in its integrity; for the efflux coming from it would then be more abundant for those to whom it is destined, instead of it being wholly consumed and destroyed and transformed into a pure and subtle fire.

He sees the processes of transformation of matter as simultaneously processes of transformation of man, exactly in the key of the alchemists:

> All that is in us becomes like to gods, just as the fire assimilates all hard and solid objects to subtle and luminous bodies; and it carries us also by sacrifice and the fire of the altars to the divine fire, just as fire mounts to fire, and this assumption draws up to the divine and celestial beings what is heavy and solid.[6]

The theurgic process of transforming man and matter by means of fire corresponds very closely to the alchemic fires of transformation. As a thaumaturge, a wonderworker, Iamblichos himself sought to transform his body; and Eunapios records the ideas held about him:

> "A rumour has reached us through your slaves that when you pray to the gods you rise aloft from the earth more than ten cubits to all appearance—that your body and your garments change to a beautiful golden hue—and presently when your prayer is ended your body becomes as it was before you prayed. And then you come down to earth and associate with us."
>
> Iamblichos was not at all given to laughter, but he laughed at these remarks. And he answered them: "He who thus deluded you was a witty fellow."[7]

Eunapios, however, probably believed the account. He tells how Iamblichos raised up an Eros and an Anteros from two springs, and how once at a seance when an Egyptian invoked Apollo (Hor), to everyone's amazement the god appeared, but Iamblichos said: "My friends, stop wondering: this is only the ghost, *eidolon*, of a gladiator."[8] In alchemic MSS Iamblichos appears as the author of two processes of transmutation, though we cannot trust the attribution. Some magicians at this time, we may note, were thought capable of completely changing their shape. Ammianus tells us of charges against Papa, King of Armenia: that he was "wonderfully skilled through the spells [*incentiones*: pipe-blowings] of Circe in changing and weakening men's bodies; and

they added that, having by arts of that kind struck them blind and by changing his own form and that of his followers, he passed through their lines."[9]

Some later historians tell us that Diocletian destroyed the alchemic books in Egypt. John of Antioch, writing under Heraklios in the 7th century, is the first we know to tell the story, though it has been suggested that he is following the historian Panodōros, an Egyptian monk, of the early 4th century. Panodōros, who found many faults in the work of Eusebios while drawing extensively on it, was often cited by George Synkellos. "Diocletian," we are told, "had burned about 290 of the ancient books of *Chemia* dealing with gold and silver so that men might not enrich themselves by this art and draw sources of wealth from it, which would enable them to revolt against the Romans."[10] The story is also told in the *Acts of St Prokopios*. Our version of these Acts seems of the 10th century, though they were cited at the Second Council of Nikaia in the early 8th and the first reduction may go back to the time of Julian in the 4th.[11] If we may trust the account, alchemic activities must have been widespread and have become linked with the growth of Egyptian nationalism in a protest against the imperial system.

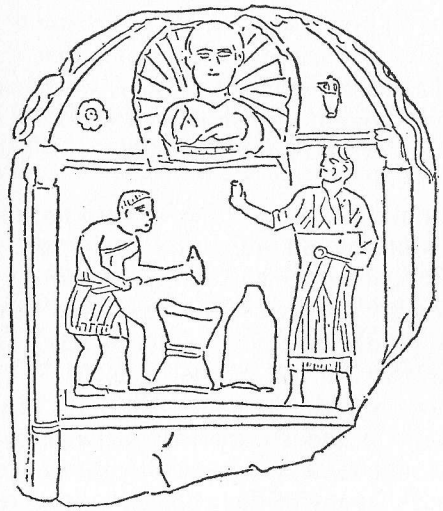
No alchemic text however refers to the persecution. This lack may be due to prudence. Throughout its early years alchemy had been associated with arts such as astrology which were liable to attract unwelcome attention from the authorities; and the practitioners may have felt averse from perpetuating any memories of suppression. To own magic books had become a crime that involved the burning of the books and the exile of the owners to an island. Poor folk, *humiliores*, found with such books, were liable to suffer capital punishment.[12] Constantius, Valentinian I, and Valens strove to put down the arts of divination, astrology, and magic. Constantius made the consultation of a professor of magic an offence punishable by death.[13] Certainly there is no reason to consider an attack on alchemists at all unlikely in such a world.

Quite possibly there was something of a campaign against alchemy as part of the drive to reform the mints in the period of Diocletian and Constantine. The empire had undergone an acute period of inflation and monetary collapse; and there was a need to reorganise the coinage on a new level. In the decades of confusion there seem to have been many attempts by the moneyers to twist



things to their own profit. About 320, for instance, Pannonia showed vast enterprises in the production of false money, gold and bronze both being involved.[14] The clearest statement of the law of counterfeiting occurs in two constitutions of Constantine. The first, of November 318, is addressed to the Vicar of Africa, but its terms suggest a general application all over the empire. Still, the Carthage mint had been closed down a few years before, after the suppression of a 311 revolt, and the government of Africa may have had a particularly grave problem of money-faking to tackle. Constantine laid down that the punishment for *adulterina numismata* was to depend on sex and social status. A decurion or his son was liable to perpetual exile, with confiscation of property at the emperor's discretion; a *plebeius* was to go into forced labour for the rest of his life, losing all his property; a slave was to die. On 6 July 326 a further constitution, addressed to the Proconsul of Africa, tightened up the previous provisions, making loss of property automatic for anyone found guilty. The reason for the law was stated as the need to keep the mints fully employed.[15]

Further enactments went on during the 4th century. For instance, a constitution of 18 February 343 offered a reward to informers who brought about the conviction of counterfeiters of gold coins. Men who forged the coins or clipped genuine ones



6. Workshop of a moneyer at Rome

were to be burned alive. That forgeries were being extensively carried out is suggested by a constitution of 12 February 149, which, while ordering that metal-workers who "purged" bronze coins of their silver coating should incur the capital punishment, added that those on whose estates and in whose houses the operation was conducted, should lose their property.[16]

The 326 constitution, we may note, used the odd term "false fusion of coins", thus referring not to the coins' falsehood but to the composing metal. Ulpian had described two ways of tampering coins, using the verbs *fingere* and *tingere*. *Fingere*, to touch, probably meant the removal of gold by rubbing, which was less easy to detect than the use of a file; *tingere*, to wash or dye, has been taken to refer to the use of *aqua regia* to remove gold—many coins of the early 7th century found at Alexandreia had thus been treated.[17] But in view of the common alchemic usage of the term "dyeing" for the production of colour-changes in metals, we may ask whether *tingere* did not have a wider sphere of reference, including attempts to colour coins, to give a golden or silver look to copper coins.

Certainly we should expect at least some members or groups of mintworkers, *monetarii*, to become interested in alchemy in these disturbed years. They were certainly suspected of all kinds of adulteration, though Constantine's wording suggests that they were thought to do their counterfeiting, not in the superintended workshops, but on premises provided by accomplices. Suspicions about their activites reached such a point that the anonymous reformer-and-inventor of the 4th century, who made a report to the government, thought they should all be forced to work on an island where they would have no contact at all with the outer world.[18]

The story about the suppression of alchemists linked them with the forces of national revolt in Egypt. Certainly the *monetarii* could become leaders of discontent. Aurelian had to suppress a revolt of theirs at Rome with some 7,000 dead; and fear of the mint-workers and the public leatherworkers in Kyzikos made Julian forbid the Christians in his retinue to enter the town lest they should join those societies in some sedition.[19] There thus seems nothing unlikely in the theory that alchemists were lumped together with counterfeiters in general by the imperial authorities at this time, and that any of their books, coming under the categories of both magic and forgery, would have been burned.



The monetary situation in Egypt as inflation gathered speed in the second half of the 3rd century is shown by an order issued in 260:

> From Aurelios Ptolemaios also called Nemesianos, Strategos of the Oxyrhynchite Nome.
>
> Since the officials have assembled and accused the bankers of the banks-of-exchange of having closed these through their unwillingness to accept the Divine Coin of the Emperors, it has become necessary that an injunction should be issued to all the owners of the banks to open these and to accept and change all coin except what is plainly spurious and counterfeit, and not to them only, but to all who engage in business transactions of any kind whatever, understanding that if they disobey this injunction they will encounter the penalties which in former years his Highness the Prefect ordained for their case. Signed by me.

The coin was divine through bearing the image of the emperor. The money being refused was no doubt the silver issues of Alexandreia which had become very debased. In such a situation the temptation for capable moneyers and casters to produce yet more debased coins would be strong.

Official correspondence from Panopolis, dated 298–300, shows the governmental anxiety over the depreciation of the currency. There was much official buying of gold, and the authorities were concerned that the correct price should be paid for it. The terms used for spurious coins in the order of 260 are *paratypos* and *kibdelos*, badly-struck and adulterated. The first term is odd; for imperfectly struck coins seem to have been usually acceptable throughout antiquity; perhaps it here means merely counterfeit in general. The word *sapros* (used properly of things like bone, wood, fish), meaning rotten, appears in a papyrus about 150 of bronze coins:

> When you said as to the banker that he should have checked the bronze, we should have examined the rotten staters. I neglected the bronze, wondering as a man who's trusted does. Yet I found them rotten and by your life and that of my children, I disposed of three. Being worthless, I sent the five to you. Let him swear they aren't his and let him change them.

Bronze, *chalkos*, seems used of small change; silver, *argyrion*, is the usual word for money. To find bronze coins of small value counterfeited is strange. (We meet *hiermarmene*, fate, called *sapros* in a magic text.)

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Not only the authorities were interested in counterfeiting of all kinds. Such activities were sufficiently widespread and significant to find their reflection in religious and philosophic thought of a dissident kind. We meet a Gnostic image of the Counterfeiting Spirit as that which the Archons of Fatality put into a man at his creation to make him sin. That is, the Rulers of the Spheres (the planets) alloyed the original spirit (gold) with baser materials, which steadily increased in power, weakening the force of the pure element. The intruding spirit grew ever stronger in the body and contradicted the motions of the spirit. A Koptic passage compares its presence there to the copper which, mixed with silver, was used as an alloy in the piece of money that served to illustrate the saying: Render unto Caesar the things that are Caesar's and unto God the things that are God's. After death the Counterfeiting Spirit bore witness against the soul of all the evils that it had drawn the latter into committing. Thus evil and good were conceived as a sort of alloy in the body's mixture. The problem was to drive out the baser compounds and to release the precious metals, of which the soul, freed from the counterfeiting or adulterating forces, would be purely composed.[20]

Though we are not yet concerned with alchemic texts, we may here cite a letter addressed by the alchemist Zosimos, who flourished about 300, to his sister:

> Zosimos to Theosebeia, greeting: The whole Kingdom of Egypt subsists thanks to these Two Arts: that of timely and that of natural sands [alchemy carried out by empiric and mechanical systems, and alchemy that follows the formative methods of nature: sands = earths, minerals]. Indeed the art that is called divine—that is, the dogmatic art [working on general or theoretical principles as opposed to empiricism]—to which are devoted all those who give themselves up to the quest for all man-made products and noble techniques, I mean the four arts considered effective—this art was handed over only to the priests.
>
> As for the treatment of natural minerals, it was a royal monopoly, and so, if it happened that a priest or a man reputed skilful interpreted the sayings of the ancients or the lore inherited from his ancestors—even though he knew these matters and saw his knowledge free from hindrances—yet he did not practise. For he would have been punished.
>
> Just as the workers capable of striking royal money did not strike it on their own account—since they'd have been punished—so, under the Kings of Egypt, the smelting craftsmen, though they knew all about washing minerals and the series of operations, did not practise it for themselves. Far from that, it was precisely to prevent such activity that they were organised in military fashion as workers for the royal treasuries. They had further individual chiefs, treasury-overseers, and archistrategoi. In short, they were all sorts of tyrannous rules for smelting. In effect, according to an Egyptian law, it was even forbidden to write on these matters and publish them abroad.[21]



The opposition of empiricism and theory we shall discuss later when we come to Zosimos' treatises; what is relevant here is the tone of the document, which accords very well with a period when alchemists were lumped together with forgers, and were being suppressed. We may note here that Zosimos links the tradition of secrecy with the need to escape persecution and prosecution. A variant text ends by saying the tyrannous rules applied not only to the smelters, but to all goldminers. "If anyone was caught digging a mine, by an Egyptian law he had to deliver up his product after depositing the account in writing." The Egyptian kings to whom Zosimos refers cannot be the Roman emperors; he is probably thinking of the Ptolemaic kings. The account by Agatharkides (given in Diodoros) of the goldmines in Nubia under the Ptolemies depicts work-conditions of desperate misery, in which death came as a welcome release. Under the Romans the workers in mines and quarries were often condemned criminals; they were under military control, with a *statio* generally adjoining the miner's camp.[22]

That alchemy and counterfeiting were closely entangled at this period is further suggested by the Leyden and Stockholm Papyri dealing with tinctures for imitating metals, pearls, precious stones and other such matters, and dated to the second half of the 3rd century. Recipes for counterfeiting gold and silver are included, with directions that show they were intended to deceive.

*Adulteration of Gold.* An equal part of *misy* and Sinopic red to an equal part of gold. Put the gold in a furnace and when it's bright, add each of the other ingredients. Take out and let cool when the quantity of gold is doubled. (Leyden, recipe 17.)

*Making of Silver.* Clean white soft tin 4 times, melt 6 parts of same with 1 mna of white Galatian copper. It becomes prime silver that will deceive even skilled workmen, who won't suppose it made by such a treatment. (Stockholm, 3.)

*Another recipe.* Add 6 parts purified tin and 7 parts Galatian copper to 4 parts silver, and the resulting product will pass unnoticed for silver bullion. (Stockholm, 4.)[23]

The word for adulteration is *dolos*: trick, cheat. *Misy*, mentioned by Dioskorides and Plinius, seems a mixture of basic iron and copper sulphates produced by a natural oxidation of pyrites; apparently used for the surface removal of copper from base gold and as a mordant in dyeing (chemical papyri), arsenical mixtures for whitening copper, in surface cleaning or coloration of metals, in yellow varnishes for such colourings , and in what was called "yellow sulphur" (alchemic MSS).

Julius Firmicus Maternus, astrologer of the 4th century, is the first known writer to use the term Alchemy. "If it is the House of Mercury, it gives Astronomy. That of Venus announces Songs and Joy. That of Mars, Arms . . . That of Jupiter, the Divine Cult and the Knowledge of Laws. That of Saturn, the Science of Alchemy." The prefix *al-* had no doubt been added by some later copyist, who knew the Arabic term; and we may assume that Firmicus wrote *Chemia* or *Chymia*. Saturn was master of lead; and according to Olympiodoros, Osiris was both a synonym for lead and his tomb the emblem of *Chemia*. (For that tomb was the place of resurrection as well as of death.) Firmicus, we noted, drawing it seems on Petosiris-Nechepso, cited the aphorism of nature rejoicing in nature, and so on.[24]

Proklos in the 5th century was well aware of alchemy. In a passage setting out the Neoplatonic creed of the vital unity of matter and the kosmos, he begins by commenting on the attempts of astronomers to explain by mechanical means the irregular motions of the heavens as made up of regular and circular ones, and on those of the calendar-makers to imitate nature which had created everything before they started with their calculations. He goes on:

> And there are those claiming to make gold out of the mixture of certain species, while nature makes the one species of gold before the mixture of those species of which they speak. And everywhere we see the same attitude: that the human soul hunts after nature with skilful devices to find how things are generated. As for the stars, there is a purpose in this, which, not by chance, has given men success in their inquiries into the regular motions of the bodies moving in circles; for this, they assert, is fitting to divine bodies.[25]

Proklos is so filled with a sense of wholeness that he cannot quite stomach any analytic or decomposing processes, even if their aim



is to rediscover or reaffirm the unitary nature of process. However, his position is pervaded by astrologic and alchemic attitudes:

> Gold and silver and every metal, like other substances, grow in the earth under the influence of the celestial gods and their emanations. Gold is attributed to the Sun, silver to the Moon, lead to Kronos, and iron to Ares. These metals have their origin in heaven, but exist in the earth and not on those that emit these emanations. For nothing involved in matter is admitted in heaven. And though all substances originate from all the gods, there is yet in everything another specific prevalence, some belonging to Kronos, others to the Sun. The men given to meditating on these matters compare these and attribute to them various faculties. These substances as a result are not the private property of gods, but are common property; for they originate in all of them, but do not reside in them. The active powers do not need them; but they are compounded on earth through the influence emanating from the gods.[26]

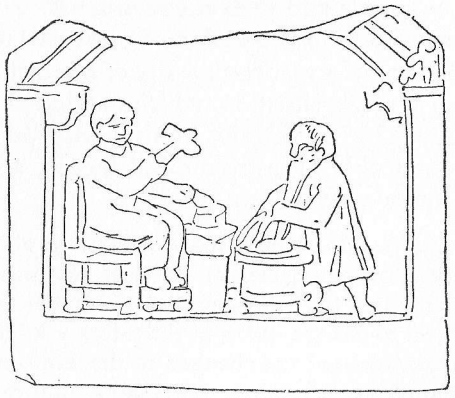
He is explaining why in Plato's *Republic* the city-guardians do not consider gold and silver, or any other things whatever, as their own private property. His terms are simultaneously astrologic and alchemic. Again, in commenting on the meaning of Plato's words about the invisible rivets that weld together the particles of matter, he employs various technical terms such as are to be found in the Leyden and Stockholm papyri; and further he cites what seems an alchemic aphorism: "All things are dissolved by fire and glued together by water."[27] Perhaps another such aphorism underlies his remark, "The better cause always conquers the lesser".[28]

The passage above about gold and silver seeks to express both the unity of the metals and their differentiation. The techniques and calculations of astrology had done a great deal to enable men to grasp the concept of a vast complexity of interacting influences upon and inside a single situation, which continued to possess its own living unity. Thus Ptolemaios in his *Tetrabiblos*, arguing that knowlege is obtainable by astronomical means, and discussing how far such knowledge can go, remarks:

> A very few considerations would make it clear to all that a certain power, emanating from the eternal aitherial sustance, is dispersed through and permeates the whole region about the earth, which is everywhere subject to change, since, of the primary sublunar elements, fire and air are encompassed and changed by the motions of the aither, and in turn encompass and change everything else, earth and water and the planets and animals therein.[29]

Then after discussing the various effects of sun and moon on the earth and its creatures, he adds: "Then, too, their aspects relative to one another, by the meeting and mingling of their dispensations, bring about many and motley changes." Dispensations is *diadoseis*, which gives a strong effect of the interpenetration of the distributed influences; and motley is *poikilai*, which suggests many-coloured, dappled, as well as the more abstract "various".[30] Ptolemaios goes on to consider how "there are circumstances of no small importance and no trifling character, which merge together to cause the special qualities of those who are born. For differences of seed exert a very great influence on the special traits of the genus." This leads him to discuss the differences caused in individual lives by the places where they are born, the ways of rearing and the customs there, and so on. On such lines as these astrology helped men to think concretely at once of both multiplicity and unity in processes, and played its part in bringing about the alchemic disciplines.

Aineias of Gaza was a Neoplatonist who wrote a dialogue on the immortality of the soul and the body's resurrection. Flourishing in the late 5th century, he seems connected with a highly educated monastic circle who were the first to cite from the corpus of works attributed to Dionysios the Areopagite; and he finally went over to Christianity.[31] In his dialogue, after arguing that the body, formed by the union of the four elements, reproduced them by its decomposition, he went to discuss the permanence of Form as compared with Matter.



7. Smiths from the region of Laodikeia



> The form subsists while the matter undergoes change; for the latter is made so as to take all qualities. Let it be a bronze statue of Achilleus. Suppose it destroyed and its pieces reduced to small fragments. If now an artisan gathers the fragments up, purifies them, and by a singular science transforms them into gold, which he again gives the figure of Achilleus, there will be gold instead of bronze in it. But it will still be Achilleus. Thus behaves the matter of the perishable and corruptible body, which by the creative art becomes pure and beautiful.[32]

Aineias is giving his version of the eternal Platonic Ideas, using a common theme (the broken-down, reconstituted state) in his own way; he is the first we know to introduce overtly the alchemic transformation in this connection. He goes on with a direct description of alchemists.

> The changing of matter for the better has nothing incredible in it. Thus it is that those learned in the art of matter take silver and tin, make their externals disappear, colour and change the matter into excellent gold. With divided sand and soluble natron, glass is made: that is, a new and shining thing.[33]

He speaks in pure alchemic idiom; for the practitioners saw their work, as we have noted, as a process of death and resurrection. Thus Stephanos says, "We must strip matter of its qualities to arrive at perfection; for the aim of philosophy [*i.e.* alchemy] is the dissolution of bodies and the separation of the soul from the body."[34]

It is likely indeed that the Christians had already, some time before, taken over alchemic imagery to express the death and rebirth of the Martyr. In the account of the death of Polykarpos of Smyrna (who died in 156) we read:

> When Polykarp had launched this Amen heavenward in completing his prayer, the pyre-men lighted the fire. A great flame burst out, sparkling. Then we saw a miracle; and we, to whom was granted the sight, have been spared so as to relate to others what happened. The fire, taking the shape of a vault, like a ship's sail bellied out by the wind, surrounded the martyr's body in a circle. And the martyr was in the midst, not like a body being burned, but like a loaf being baked, or like gold and silver that is purified in the furnace. As for us, indeed, there was wafted a delicious perfume, as strong as that of incense or some other of the precious aromatics.[35]

Eusebios reproduced the narrative, omitting the bread but keeping the gold and silver; Syriac and Koptic versions follow his History. The ultimate source of the furnace-image was no doubt Daniel III; but the form here taken shows alchemic influence.[36] The bread-image brings in the idea of the leaven, of fermentation. A transitional stage to the version of Aineias appears when the Fathers of the Church describe, in the case of Polykarpos and other martyrs, the resurrected body as a statue of noble metal, purified in the fire.[37] We may note also that Gregory of Nazianzen speaks of "the lead of the flesh"—that is, of the unregenerate condition that needs to be transformed into heavenly gold.[38]

Such imagery was indeed very real and heartening to the devoted Christian in the days before the Church's triumph, since he was liable to be persecuted and burned to death. For him the Fire had a dual meaning. It represented an ordeal. "The apostle has promised that a like thing will happen to us," cried Ambrose, dealing with fables of Phoenix and Eagle, "when he said: Fire will prove what is the work of each." He refers to a plunge into the spirit (fire) and water; the fire here is also that which at the world's end will flood the earth with destroying flames, proving, purifying, dividing.[39] It, however, is also a redeeming and transforming force.

> Then when the clay of our flesh, as has already been said, has been cooked by the fire into a vessel [*testa*] so that this flesh, previously pressed down to the earth by a heavy burden, may with the aid of angels fly away towards heaven after receiving the wings of spiritual grace, it has here eternity as a genuinc and appeasing pledge for its safety.[40]

In this set of confused metaphors we meet the imagery of the pottery-kiln. By baptism the worshipper is baked into a pot, hardened by fire into a new birth.

Several Byzantine historians—Kedrenos, John Malalas, Theophanes—tell of an alchemist Johannes Isthmeos who gave the emperor Anastasios a horse-bit of massive gold. "You won't deceive me like the others," said the emperor and clapped Johannes into the fortress of Petra, where he died. We assume that Johannes failed to produce any more gold. His tale gives the impression that claimants to the power of gold-transmutation were now fairly common and that they did not hide their claims.[41]



Johannes Philoponos, Byzantine scientist of the 6th century, was much interested in the relation of colours to various fuels.[42] In discussing the relation of soul and body, and denying that it can be defined as juxtaposition, mixture, or intertwining (as with ropes), he states, "The soul neither merges with the body into one substance as in the case of fusion, *e.g.* in drugs and chemicals, nor is it completely lacking in affinity and relationship to it, as is the case of supramundane powers."[43]

John of Damas (Damascus) in the first half of the 8th century used alchemy in a poem, the *Dioptra*, a dialogue between body and soul. The body argues that man's state cannot possibly be brought near to God's, and the soul replies:

> It's just the same as when lead and gold are exiled far apart, a distance yawns between their homes, a vastness separates them. A certain craftsman then might come and seek to show his skill, the operation of his art and his scientific lore; he'd take the lead and melt it down inside his fiery furnace, he'd show the lead transformed to gold, the best in quality. All this is marvellous indeed, it's strange beyond belief, that what was never gold before should turn to actual gold, what wasn't gold should turn to gold, though different at the start. O great display of excellence! O great display of reason.[44]

But by this time alchemists were no longer shrouded in such mystery or worked in such a secluded way, even if they remained strange figures of esoteric lore. The alchemist Olympiodoros seems certainly the historian of the 5th century; and by the time of George Synkellos, chronicler of the later 8th century, the tradition has come largely into the open. George knows the main authors well, recounts the initiation of Demokritos by Ostanes, Maria the Jewess, and Pammenes. He cites his four books on Gold, Silver, Stones, and Purple, in almost the same terms as the alchemist Synesios. (Scaliger thought he was drawing on Panodoros, whom he certainly knew and praised.)[45] Synkellos also cited passages from the alchemists Zosimos and Synesios; and some of his citations have come down in their place in the alchemic manuscripts.

Then about 850 Ibn-Abi-Yakub-An-Nadim in his encyclopedia, *Khitab-al-Fihrist*, gave a list of writers on alchemy: Hermes has pride of place.

> Works of Hermes on Magic, Books of Hermes to his Son on Magic, Book of fusing Gold, Book addressed to Thoth, on Magic etc. Ostanes

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of Alexandreia: he has written a thousand dissertations on Secrets and Enigmas etc. Zosimos has followed the same way as Ostanes. He has written the Keys of Magic, which include a large number of books and treatises.

The names of the philosophers who have occupied themselves with magic include Hermes, Agathodaimon, Onatos, Pythagorean Philosopher of Crete, Plato, Zosimos, Demokritos, Ostanes, Herakles [or Heraklios], Maria, Stephanos, Chymes, Alexandros, Archelaos, the Christian Priest Ares.[46]

Then follow several names we cannot link with known Greek alchemists. We are also given a list of book titles, which the author cites as having himself seen or found recorded in a reliable source. Among unknown works, we find many that are extant: Dioskoros on Magic, the works of Maria the Kopt, Alexandros on the Stone, the Book of the Red Stone, Dioskoros in reply to Petasios, the Book of Stephanos, the Great Book of Maria, the Book of Eugenios, the Book of Queen Kleopatra, the Book of Sergios addressed to the Bishop of Edessa, the Great Book of Ares (or Horos), the Little Book of Ares, the Book of the Nazarean, the Book of Demokritos, the Book of Zosimos addressed to All the Sages, the Book of the Monk Sergios on Magic, the Dissertation of Pelagios, and so on.

When we review the evidence collected in these two chapters, we must admit that it is very fragmentary and oblique till we come to the 8th century. Yet in view of the strange way in which Alchemy, as the first stage of chemical science, arose and developed, we could hardly expect otherwise. It is only with the first century A.D., with the references by Columella, Plinius and Seneca to Bolos-Demokritos, and with the comments of Dioskorides on lead and mercury, that we reach anything like sure ground. Even then the aspects of alchemy that have reached the more open fields of culture are slight and obscure. There is however the account of the emperor Gaius' attempt and failure to produce gold, to back up the other references.

Some authorities have set Bolos-Demokritos only a generation or two before Plinius and Columella. But this seems unlikely. With such a deeply-buried lore as that of alchemy we must allow a much longer time for the ideas to percolate upwards from the level of secret practices. We have seen how ideas from cooking and brewing impacted on Greek theoretical thinking in the 4th



century B.C., especially through the study of botany in the Aristotelean school. The Karnak text of the 2nd century shows that such ideas were sufficiently current to affect the cosmological formulations of the Egyptian priests. We can then reasonably conjecture that the nexus of ideas from metallurgy, brewing, dyeing, perfume-making and so on, which lies behind alchemy, had been active for some time in Alexandreia and had been moving towards its final synthesis. Bolos of Mendes seems the thinker responsible for the first definite step, which brought together a number of lores and concepts in a coherent form. The 2nd century seems the best period in which to place him. By the 1st century A.D. alchemical ideas in a limited scope were beginning to be more widely known. By the 3rd century they were at their phase of most powerful expansion, linked with a large number of kindred developments in the religious and philosophic spheres.

These dates are supported by what seems an early alchemic text, a papyrus written in a round uncial hand of the late 1st or early 2nd century A.D. It is fragmentary, but some treatment of silver seems the main theme. We meet something moonlit, the washing of a *stypteria* "which the dyers use", processes of rubbing and mixing "until the silver" shows a colour which may be of gold, something described as pure. If the missing word of which we have *ou(s)* was in fact *chrysou*, we could be sure that the text was alchemic. (What seems the *s* of *ous* was added later on the papyrus.) A *stypteria* was an astringent substance containing alum or ferrous oxide: here it is doubtless alum. It the papyrus is indeed alchemic it shows that recipes were being written out in a town like Oxyrhynchos round about A.D. 100.

In any event this text will serve us for the turn into the consideration of the alchemic material itself; and first we must inquire into the enigmatic name of the new science.

# 4

# The Name Alchemy

THE name Alchemy has come down to us through the Arabs, to whom we owe the prefix *al-*. But exactly what the *chēmia*-art meant is not so easy to make out. There were two forms in Greek for the name of the art: *chemeia* and *chymia*. But as they were at first used for long only in alchemic treatises, of which we have no early texts, with no clear references in non-alchemic works, we have no proof as to which was the earlier form.

Let us start with *chymia*. This word may be connected with *cheein*, to pour or let flow, from which came the verb *choaneuein*, to cast in a mould, to smelt, and also the term *chyma*, "that which is poured out or flows, a fluid." We find this usage for *chyma* in Aristotle. Alkiphron later has *chyma niphados*, snowflake; and the astronomer Ptolemaios speaks of the four *chymata* or humours: the hot and the moist, the dry and the cold. Already in the 3rd century B.C. we find *chyma* used for ingot or bar, in an inscription from Oropos; in the 2nd century, in another at Delos dealing with gold. The term thus intrudes from the metallurgical world as commonly-used for a cast or smelted product; and this fact gives it a great claim to underlie the name of Alchemy.[1] *Chymia* would mean the art of casting or alloying metals. It seems to occur in a passage cited by George Synkellos from Zosimos; our Greek manuscript gives *chēmeia*, but the Syriac version has *khumia*. Again, in Olympiodoros we meet *chymia*, though Johannes of Antioch gives *chēmeia*, as do the *Souida* and other late sources.[2] The claims of *chymia* are again supported by the name given to an alchemist, Chymes; but here again we come up against variants, Chymes, Chemas, Cheimas. Still, it seems plausible that at least by the time of Zosimos a general term *chymia* had developed out of the metallurgical use of *chyma* to describe, not only alloying, but also the transformation of metals. We may assume a long period when the term was evolving underground.



Earlier than any of the verbs the term *choanos* is attested, meaning a hollow or melting-pot into which metal is poured. In the *Iliad*, in the forge of Hephaistos:

> The bellows, twenty in all, blew on the *choanoi* sending out a ready blast of every force to help him along as he laboured hard and again in whatever way Hephaistos might wish his work go on. And over the fire he put stubborn bronze, and tin, and precious gold and silver; and then he set a great anvil on the block and grasped a massive hammer in one hand, the tongs in the other.

And Hesiod writes of the earth-convulsions during the battle of Zeus with Typhon (*Typhoios*):

> A great part of the earth was scorched by the terrible vapour and melted as tin melts, heated by men's art in well-bored *choanoi*, or as iron, hardest of things, is softened by glowing fire in mountain-glens and melts in divine earth through Hephaistos' strength. Even so the earth melted in the glow of the blazing fire.

*Eutrētoi*, well-bored, probably refers to the spouts of the pots or crucibles, meaning "well-channelled". *Choanos* itself means "pouring-pot or channel", for a cognate form *choanē* was used for "funnel", and the two terms *chyma* and *choanos* show how deep-rooted and ancient was the root *cheein* in the craft-jargon of miners and smelters.

*Chymia* (*chymeia*) belongs in fact to a series that refer to an activity or occupation. This, *mageia* refers to the profession of the *magos* as magician; *taricheia* to that of the embalmer, *taricheutes*; *metalleia* to that of the miner, *metalleutes* (mineral-quester). *Chymia* is the work of the metallurgist or alloyer; and we would expect a related noun for the man who carried it out—probably *chymeutes*. But we have no record of such a word, though the adjective *chymeutikos* occurs in the alchemist Zosimos. Indeed metallurgical and mining terms were slow in getting into literary Greek, though there must have been many of them in common usage.[3] In the *Odyssey*, *metallaein* means simply to search or inquire in general. By the time of Plato *metalleuein* was used for mining (though we find only the passive in his writings); the verb was used actively by Philon the Mechanic (3rd or 2nd century B.C.). Plato also used *metalleia* for the quest after minerals or underground channels, the plural of *metalleion* for minerals, and *metalleus* for the man seeking minerals or water. The searcher is *metalleutes* in Strabon.

Herodotos knew *metallon* for mine or quarry; but it is not till the 1st or 2nd century A.D. that we find texts in which it means mineral. However, in such technological matters the literary evidence can be highly deceptive. We have to look to inscriptions for *chyma* as ingot. When *metalloiōsis* was first used for the transformative process of metallurgy, it is hard to say. The word means "an alteration into another state". By chance it sounds as if it incorporates *metallon*; and no doubt because the idea of transformation had become so imbedded in the very idea of metals and metallurgy, Plinius made the baseless derivation of *metallon* from *met' allōn*, as if it also held a meaning of changing-into-something-else.[4]

But how then did the other term, *chēmeia* or *chēmia*, come about? The form may have occurred as a chance variant of a non-literary word used for centuries by workers in and around the metallurgical field. But it has been suggested that it arose through contamination with *chem*, Egyptian for "black", or that *chēmeia* had nothing at all to do with the terms *chyma-chymia* but was born solely out of *chem*. Egypt was called the Land of the Black or Fertile Soil, especially with reference to the Delta where much silt was deposited. The Egyptian word was *Kmt*, and the hieroglyphic sign has been taken to represent a charcoal-heap, a crocodile's tail, or a piece of fish-skin; in Koptic we find two forms, Saharic and Boharic, pronounced *Kime* and *Khime*. The adjective, however, was expressed by a periphrasis, *Pmn-Kime*, "People of the Black".[5]

Philologically then there is not much to be said for the interpretation of *Chemeia* as the Black or Egyptian Art. But that does not disprove some sort of linkage between *Khime-Kmt* and *Chymia* in the minds of alchemical practitioners. We continually find that the ancients were liable to take similarities in sound as expressive of some secret or deeply-significant connection; and if it is true that much of early alchemic developments was carried on by groups in Egypt, someone or other may have noted a certain echo of sound in *Chymia* and *Khime* and considered it to be mysteriously suggestive. Ploutarch tells us:

> The Ox kept at Heliopolis, which they call Mnevis [sacred to Osiris and thought by some to be the sire of the Apis], is black and receives secondary honours to those paid to Apis. Also, Egypt, which is of a black soil in the highest degree as well as the black part of the eye, they call *Chēmia* and compare it to a heart. For it is hot and moist . . .[6]



Clearly then people were generally aware, in Graeco-Egyptian circles, of the way the term "black" was used in Egypt, with its various points of reference. We may note also an odd symbolic equivalence of Black and Gold in Greek thought. Early in July 440, when the Samian war was being fought, the Proxenos of the Athenians in Chios invited the poet Ios of that island to meet the dramatist Sophokles, who had been sent as one of the *strategoi* of the year to collect contingents from Chios and Lesbos. A schoolmaster from Eretria, present at the party, questioned the propriety of a line by Phrynichos which Sophokles quoted: "There shines on his crimson cheeks the light of love." Sophokles in reply pointed out that colours were used symbolically in verse and art. Thus, a poet wrote of Goldenhaired Apollo, but "if a painter had made the god's locks golden instead of black, the picture would not be so good."[7] So Apollo was shown with black hair, though in ritual or symbolic terms it was golden.

In the *Korē Kosmou*, Kamephis transmits the *gnōsis* to Isis, "when he has gratified her with the gift of the Perfect Black," and in a magical papyrus we read, "I conjure you, Lady Isis, whom the Agathos Daimon [the Good Spirit] agreed should rule in the Perfect Black."[8] There seems to be some connection of the Perfect Black with revelation or magical activity; and indeed the term *Teleion Melas* has been taken to refer to alchemy as the Black Art or Black Ritual—it could be translated as "the Black Rite". The geographical explanation indeed seems the more likely, since in these late days Isis was looked on as the Lady of Egypt.[9] But we need not all the same rule out an emotional identification of Egypt, the Black Land, as the source of all ancient lores and magics, with those lores and magics themselves—and in particular, here, with the alchemic art. In an alchemic text, presented as a revelation of Isis to Horos, we are told how the goddess went to Hormanouthi (the temple of Horos at Edfu) to receive the science of Alchemy. She encounters an angel, then a superior one, Amnael, to whom she gives herself. Amnael tells her the secret lore on condition she hands it on only to her son.[10] Kamephis, whom we shall see later as Kneph-Agathodaimon, can also be seen here as Amnael. So we may say that he gave Isis both *Chēmia* the Blackland and *Chēmia* the Art.[11]

There is yet another point. The desire to identify *chymia-chēmia* the art and *kmt-chēmia* the land may have derived from a wish to assert the Egyptian origin of alchemy against other claimants.

From the texts we can make out two schools, that of the Egyptians and that of the Jews. There was rivalry between the two nationalities here, as in the hermetic or gnostic worlds. A magical text states: "It is this very Book that Hermes plagiarised when he named the Seven Perfumes of Sacrifice in his sacred book *The Wing*." Hermes-Thoth, exemplar of the Egyptian school, is accused of stealing from *The Book of Moses*.[12] Stephanos writes, differentiating the Egyptian techniques, which he links with Hermes and which he approves:

> There are certain of the things that suffer restoration. For he [Hermes] says, that the rainwater [?] of the true art is burned and is fugitive in fire, but suffers from the fire, and, crossing over, it is not melted. And [in] the roasting of the projections according to the Egyptian, which he uses, the drug is not melted in the tincture. So has said the critical [*kritikos*] teacher and philosopher and guide: just as a sling passing by someone may wound him [that which is gone is a result of the strength of the thrower], so then is gone the wound of the man standing in the way. But he who has it, has it whoever he is, if indeed it truly is gone. So also the ash itself runs and tinges indelibly and makes indelible the cause of the tincture, or the drug is dissolved into its kindred fire and air, as being fugitive and burnt up in the bellies of its parents.

He thus stresses projection as the Egyptian method.

> The melters of gold . . . employ projections according to the methods of the Egyptian: which matters, corrupted, the Etesian Stone itself operates when well managed, as also do we. And do not wonder if from many stones and various species the stone, being one, is born and is so spoken of. Do you not see that those who cultivate the Muse and Things of Beauty, as they make animals and glasses and dyes, make a single stone from many species? Especially they make it from lead and that which has become bronze-like, so that they may not lack a carving. And as such useful stones make all such things, from many stones they make one stone, which they call the Etesian Stone.

National differences also in spells and spellbinders were recognised. A prayer-and-exorcism by Gregorios asks for protection against any ill-bringer, "whether a slave or a freeman, a wizard or a witch, a Persian man or woman, a Chaldean man or woman, a Jew or Jewess, an Egyptian man or woman, in short anyone whatever."[13] The existence of the two alchemic schools is declared in *A Genuine Discourse by Sophe* [*Kheops*] *the Egyptian and by the God the Hebrews the Lord of Powers Sabaoth*: "For there are



Two Sciences and Two Wisdoms: that of the Egyptians and that of the Hebrews."[14] Further in the works of Maria we meet a curt claim to a Jewish monopoly of the innermost secrets of the art. "Do not take it in your hands. It is the Igneous Remedy. It is mortal." To this general prohibition she adds the direct order to non-Jews: "Do not touch it with your hands. You are not of the race of Abraham. You are not of our race."[15] Zosimos says that the Jews gained knowledge of the sacred art by fraud and then revealed it.[16] Perhaps behind Maria's remarks lies a general fear of touching gold as something with too great an innate power, which might blast as well as aid. Only the Jews, she insists, can safely ignore the taboo. We find such a taboo urged in the life of the Kopt Saint Senuti in the 6th century.[17] Further the *Letter of Demokritos to Leukippos* states that the writer is going to set out in ordinary Greek the secrets he has found in the books of Persian prophets: works with a series of riddles, which had long past been confided to the Phoinikians by "the ancestors and kings of divine Egypt". The writer is seeking to show the priority of the Egyptians over the Phoinikians. The same national rivalry appears in a tale told by Rufinus that Persian fire-worshippers asserted the superiority of the element fire over all the gods of Egypt. So a priest of Kanopos took a perforated vessel of the sort used for filtering water, stopped up the pores with wax, and set it on fire; but the fire was soon put out by water issuing from the holes as the wax melted. After that, Kanopos was represented with a waterjar-shaped body, a short neck, and very small feet.[18]

However, *kmt* as "black" is not the only possible Egyptian source of *chemia*. It has been suggested that the term derives from the Book of Wisdom, the ancient *kmj.t'*, often cited by scribes from about 2,000 B.C. onwards. Zosimos mistook this work for the *Satire of Trades*, in which the toilsome lot of the smith and other craftsmen is described and compared with the easier life of the scribe. *Chemeu*, it is argued, could be derived without difficulty from *kmj.t'*; and Zosimos and other alchemists linked this *chemeu* by using the Greek word *chymeutes*, metalfounders, for chemists.[19] Such a line of argument is highly farfetched and does not carry much conviction. However, one advocate of the claims of *kmj.t'* has argued that the word is derived from the verb *km*, meaning "to complete, bring to a close, execute (the preparation of ointments), finish off (metalwork)".[20] Hence the title of the *Wisdom Book* implied that the work gave the advice needed for completing

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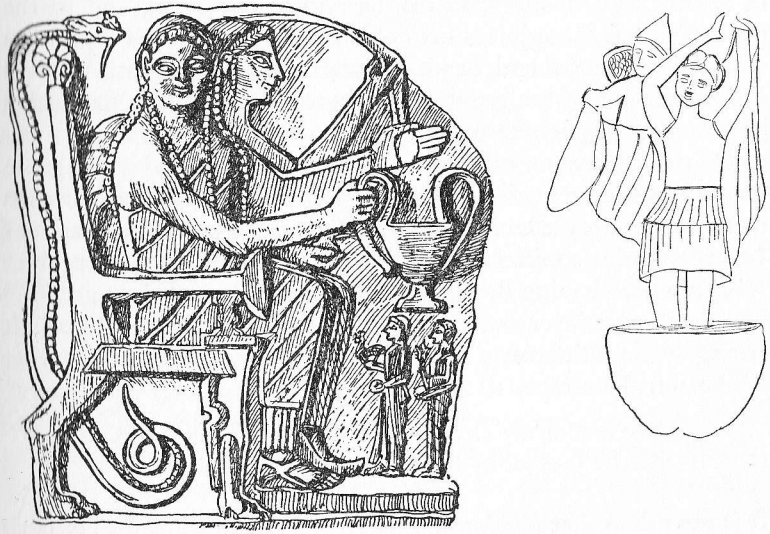
or fulfilling what the gods had already made inherent or potential in human actions and material objects in the process of creating them. *Km* would thus in one sense mean the repetition of the original creation of the world—expressing human creativity as derived from, and imitating, the divine activity. Such an idea was Egyptian enough: that men merely worked out, repeated, completed what had been planned and made inherent in things from the beginning, and that, in doing so, they needed guidance.

The derivation of *Kimiya* from this ancient Egyptian verb is certainly more logical than deriving it from the other root *km*, which means Black and has been used to form the expression (Coptic) KHME or XHMI meaning Egypt from the black fertile soil of the Nile valley. The use of this km, Black, for Chemeia might imply that there was a contrast between the "Black Art", Egyptian chemistry, and a "White Art", such as is often mentioned in the Middle Ages when alchemy was proscribed as an occult occupation, but which to my knowledge does not exist in Greek chemical documents of an early period. (Forbes). [21]

But, as we have seen, there is no need to postulate a White Art against the Black; the contrast is between Black (Egyptian) and Jewish. It is possible however that some Egyptian derivation from *km* in the sense of fulfilment did enter into *chēmeia*, on the lines of the fanciful etymological identifications already mentioned. If so, it is of interest to note that we have a duplication in the term *Teleion Melas*. For then *melas* would be a translation of *km* (black) while *teleion* expresses in Greek exactly the meaning of *km* (fulfilment). But this is no doubt only an odd accident—not the only oddity that turns up in this trail of possible derivations of the word Alchemy. (*Teleion*, incidentally, could be used to define the full inundation of Egyptian soil.)[22]

No sooner however dó we decide that the term *chēmeia*, as developed by the time of Zosimos, perhaps combined a Greek metallurgical term with various Egyptian overtones as the result of the broodings of Graeco-Egyptian practitioners, than we find that there is an altogether new claimant for the original basis of Alchemy. We must not forget that we do not know if *chēmeia* or *chymia* was the early term. If it was *chymia*, we must look also at *chymos*, which is Greek for plantjuice and is etymologically linked with *cheein* like *chymia*. *Chymos* extended its meaning to include animal juices or humours. Indeed it is hard to say if the





8. Lakonian relief from Chrysapha, about 550–30 B.C.: man with kantharos, squeezing juice; wife holding pomegranate; boy with cock and egg; girl with flower (lotus or pomegranate). Also, terracotta of Kore rising up out of ahalf a pomegranate.

plant or the animal usage was earlier. Aristotle and Theophratos both use the term of plants; but Aristotle also applies it to animals and further uses it for juice in general. He also uses it to mean "taste."[23] *Chymos* is in fact cognate with *chylos*, which in its turn meant plantjuice, was applied also to animals, and further defined a decoction, gruel or barleywater. It too was used for "taste." As *chyle* it was employed by Galen for the juice or fluid produced by the digestion of food. *Chyma* and *chymos* could indeed be confused, as we see when Ptolemaios describes the four humours as *chymata*, not *chymoi*.[24] There thus seems a close link between fused metal and plantjuice in the Greek terms derived from *cheein*; a link between metallurgical and digestive processes. We noted above the way in which cooking, digestive, and fermentative processes forced their way into the thought of the 4th century B.C. Clarification in the use of the various words from *cheein—chymos*, *chylos*, *chyma*—may well have occurred at that time, as the first stage to the emergence of the idea of chemical action in general: *chymia* or *chēmeia*.

*Chymia* may perhaps have referred primarily to the production

of juices used in drugs, in magic, and in digestion, and to the processes that these juices brought about. The juices in question would be those that had, or were thought to have, a transformative action on human bodies and on material objects. We may seem here wandering far from the realm of metallurgy; but we must recall that juices or other plant-products had a wide usage in magic apart from medical recipes and the like. They were used in metallurgy. A traveller in 1862 in Cypros met the Turkish pasha of Nikosia, "who spoke eloquently over flowers and at times over *Kimiya*, a herb having the virtue of converting metals into gold".[25] This juice was the active principle in an alchemical process, and it strangely had the very name of our quest. The Persian poet Firdausi had a couplet:

> Not one of the Dead by the Herb was resurrected.
> Poorly they all by the *Kimiya* were effected.

It is seen then that *Kimiya* as a resurrecting and transmuting herb had a long history in the regions of Arab influences. Not that the magic herb was restricted to those regions. In an account of Indian superstitions we are told how a master (Bhagatjee or devotee):

> ordered a large half-anna copper coin (which was current in 1893 and was the size of a rupee or of a florin) to be brought, and taking one out of my pocket it was produced at once. Then he directed a Huqqa claypipe to be made ready. I also sent for some pure tobacco of my own. Bhagatjee handed over to me a little of some fresh herb saying that it was to be mixed with the tobacco and the copper coin, which was in my hand, was to be placed on top of it. When the pipe was ready (with its charcoal glowing) I was ordered to start smoking which I continued to do for a little while when he asked me to tip over the clay pipe, and having done so I found the copper coin had instantaneously turned into gold.[26]

We are not told the name of this herb; but the name of that used in the Arab world is indeed striking. Was it transferred to the herb after the introduction of Greek alchemy? or does it give us the clue to some earlier connection of metallurgical magic of which we know nothing? In any event its existence makes us pause before rejecting *chymos-chylos* as a candidate for the origin of the term *chymia*. The notion of the resurrecting and transmuting herb or herbjuice clearly links with that of the herb or water-of-life



which plays a very important part in folklore and myth, which in the Near East is found in the epic of Gilgamesh, and which reappears among the alchemists as the divine water.

The transmuting or resurrecting drug certainly existed in early Greek rites and myths. Poppy and pomegranate, for example, seem to have been importantly used in rituals going back to Minoan-Mykenean days. Associated with the Earthmother, they no doubt played their part in death-birth ordeals and initiations. Mekone, where Prometheus met and cheated the gods in the allocation of the parts of sacrifices, seems to mean Poppyland. In Asia Minor the production of opium went on into the Roman period in a big way. Coins of several towns show the poppy. Prymnessos (the nearest ancient town to Afiom Kara Hissar, Opium Black Fortress, where is a chief modern centre of opium production) struck a design of two ears of corn and poppy; Synnada and Beudos, close by, had a similar design or one of corn-ear and poppy-head side by side. The Synnada coins are of the last century B.C.; those of Beudos Vetus, of Hadrian. A coin of Ankyra, minted under Philip, shows the city-goddess holding in her left-hand a "pomegranate" in a scene closed in by cypress-trees: the "pomegranate" may well be a poppy-capsule ripe for slitting.[27]

The word *papon* or *papa* seems to mean poppy in Anatolian. It occurs on several altars: *thymelai* or incense-altars of *papōn*. One dedicatory altar with a relief of a ripe poppy-capsule is described in the inscription as a Hermes; it had a saucer-like hollow on the top where the dedicator (? a priest Diomedes) burned poppy-opium. (The local folk said that rainwater collected there cured sick people.) Coins of Colonia Antiocheia show the Tyche of the town holding in her right hand a lustral branch turned downwards or pouring the contents of a horn-of-plenty on to an altar. The altar is a *thymele papōn*, and what she pours is opium, the chief product of the territory and the source of its wealth. It is associated with Dikaiosyme and her scales, as the goddess of fair dealing. The word *Papai* occurs alone on one side of a large sepulchral altar at Piribeyli, on a pass over Emir Dagh. At Hierapolis we find an inscription that tells how a council of the official of a guild of purple-dyers carried out the burning of *papa* "on the customary day" once a year, using the interest on 3,000 denars to meet expenses. (If they neglected the proper investment and caused a loss, the remaining sum was to pass to the *ergasia thremmatike*, the

cattle-raising society—an odd injunction: it has been suggested that *thremma* here has the sense of *threptos* and the society was one for looking after orphans.) We are not told what deity's festival was involved. At Abassos, near Amorion, a funeral ceremony was to be celebrated at the Mithrakana; and we may note the association of the poppy-offering and sepulchral altars, of the Tyche of Ankyra with a cypress-grove (? cemetery). As a drug of communion with the gods it was perhaps thought to aid the dead in their spirit-journey, in their afterlife.[28] Prometheus seems to contact the gods by entering Poppyland: by entering an opium-trance. As a drug of initiation and death-birth, opium had the value of an elixir transforming the condition of its user. On an Apulian vase we see a male and female worshipper approaching an aedicula with a large poppy growing out of a tomb: an epiphany of the dead man in plant form. On a higher level are shown beings in a godlike state.[29]

On a grave-relief of 550-530 B.C. from Chrysapha in Lakonia we see two dead persons (man and wife) in heroised or divinised form. The man holds a big *kantharos* and squeezes some juice into it through a long piece of cloth; the woman holds a pomegranate (source of the juice) and helps in the operation of straining or filtering. Below, and in front of their throne, stand a boy and a girl: the boy holding a cock and an egg, the girl a flower (lotus or pomegranate?) and a pomegranate.[30] We certainly have here a representation of rebirth through fruitjuice. The fruit of the pomegranate is a rich red; in the Balkans it is still considered that the red flowers stimulate blood.[31] It was similarly venerated in China, though there it was only one among various immortalising agents. We may note also that a herb *prometheion* was said to grow on the Caucasus from the bloodlike ichor of Prometheus; it was golden and caused an earthquake when plucked; Medeia used it to give Iason invincible or deathless power. And Prometheus was closely connected with the cults, with the mystery-initiations, of various fire-crafts such as metallurgy and pottery.[32]

That the *prometheion* itself had some part in such initiations is suggested by the role of a herb in a myth of the Kabeiric Mysteries. Clement of Alexandreia tells us:

> If you would like a vision of the Orgies [*orgia*: secret rites or mysteries] of the Korybantes, here is the story.
>
> Two of the Korybantes slew a third one, their brother. They covered the corpse's head with a purple cloak, then wreathed and buried it, after carrying it on a brazen shield to the skirts of Mt. Olympos. So we see what the mysteries are: in a word, murders and burials.
>
> The priests of these mysteries, whom those interested call Presidents of the Rites of the Princes [the Korybantes or Kabeiroi], add a portent to the dismal tale. They forbade wild-celery, *selinon*, root and all, to be set on the table; for they actually believe that selinon grows out of the blood that flowed from the murdered brother.
>
> It's a similar custom, of course, that is observed by the women celebrating the Thesmophoria. They are careful not to eat any pomegranate seeds that fall to the ground, being of opinion that pomegranates spring from the Blood of Dionysos.
>
> The Korybantes are called by the name Kabeiroi, which tells us all about the Kabiric rite. For this very pair of fratricides got possession of the chest in which the genitals of Dionysos were deposited, and took it off to Tyrrhenia [Tuscany], traders in such glorious wares. There they stayed, being exiles, and communicated their precious lessons of piety, the genitals, and the chests to Tyrrhenoi for purposes of worship. For this reason, not unnaturally, some want to call Dionysos Attis, because he was castrated.[33]



We see here the pomegranate as blood-fruit linked with *selinon*. That the murder-rite was metallurgical is shown by Zenobios: "The brothers put their third brother to death. They bury him under a mountain. His body changes to iron."[34] The myth was thus one of the birth of iron; and *selinon* had some close link with the iron's myth and craft-ritual. *Selinon* was an immortalising or resurrecting herb; for it was used to crown the victors of the Isthmian and Nemean Games, and chaplets of it were hung on tombs. It was also a synonym for the vagina and thus was an emblem for the Earthmother's genitals as well as of the murdered Brother. The Kabeiric connection with metallurgy is further shown by the representation of a Kabeiros with a hammer, *e.g.* on coins of Thessalonika, where he also holds a rhyton. We also find a Kabeiros with hammer on the back of a Mithraic stone; on the front Mithras slays the Bull.[35] An odd survival of one of the Daktyls (another cult-fraternity or mythical reflection of such a metallurgical group) occurs in a late magical text where we find "Damnamanaios and Adonaios and Sabaoth;" Damnamanaios is a variant of Damnameneus, one of the Idian Daktyls associated with the Great Mother. Damnameneus, associated with Nikaroplēx, appears on magical gems.[36]

Attempts have been made to find direct alchemic ideas in the Kabeiric deities and myths. The Kabeiric triad has been thus

analysed: Axiokersos stands for the Sun (Apollo-Helios), Axiokersa for the moon, Axieros as the completed Hermes, the fused alchemic Hermes—with the fourth figure Kasmilos as symbol of the Hermetic essence, of harmony and gradation. But this sort of interpretation makes the early mystery-ideas far too definite; it mistakes a necessary pre-alchemic phase of simpler fire-magic and of intuitive images of union and change as the highly sophisticated product that could only emerge after craft-mysteries had united with various philosophic schemes and systems.[37] A *pharmakon* was used in the Mysteries of Eleusis. The *synthema* or password, expressing the novice's fit state for initiation, began, "I have fasted, I have drunk the *kykeōn*." The fast seems to have lasted nine days. *Kykeon* merely means "a mixed and (if necessary) stirred drink", but from the Homeric *Hymn to Demeter* we learn that it consisted of barley-groats and water mingled with "tender *chlērōn*." Ovid adds the detail that the barley was toasted before being crushed into groats. Such groats, in water, produce malt which may taste sweet and become alcoholic after short fermentation. Arnobius, speaking of the rite, says, "I drank out," that is, emptied the potion. No doubt the small pots carried by the men in the procession held a precise measure. *Chlērōn* or *blēchōn*, used in a tender (fresh) state, was some variety of pennyroyal. This plant produces the peppermint-tea drunk widely still in Central Europe; in North Africa the green leaves are used to make a mild stimulant. The main ingredient of the poley-oil from the plant, *mentha pulegium*, is an aromatic substance pulegone, which in large doses can bring about delirium, loss of consciousness, spasms. A plant of the same family in the Sierra Mazateca, Mexico, has the effect of a *phantasticum*.[38]

It is thus likely that the *kykeon*, imbibed on top of a long and thorough fast, would produce an extreme responsiveness in which the imagery and rites of the mystery would have a profoundly exciting effect, making the experience seem indeed a divine revelation. *Blēchōn-glēchōn* suggests a carminative or antispasmodic, but that does not remove it far from a narcotic. Pindar uses the adjective for the rivers of the underworld from which darkness flows out: "The sluggish rivers of the dusky night," and Quintos Smyrnaios speaks of the "the sluggish gift of sleep". In Aristophanes' *Peace*, Hermes recommends a *Kykēon* with Mint to Trygaios who is to wed Opora (Fruit-abundance) and fears that such a bride will make him sick. Herakleitos, asked by the



rebellious Ephesians for advice, took a cup of cold water, sprinkled barley in, stirred it with a branch of the herb, then drank it down. Hipponax, a tumultuous character, cried out for a whole bushelful of barley to make a *kykeōn* and combat his *ponēriē*, his bad (moral) state. These three last examples suggest strongly that *chlērōn* was thought to have a pacifying effect, a tranquillisation of the sort that we noted as effective for the heightened reception of the messages and symbols of the mysteries.[39]

*Glēchōn* gained an immense reputation among the later botanists. They recommended it for severe thirst, fainting, headaches, coughs, colics, renal troubles, indigestion, tertiary fever, nervous maladies, liver-affections, womb-disorders, stings of poisonous creatures, miscarriages. The Romans called it a panacea, *omnimorbia*. How far this high esteem went back we do not know. The term *omnimorbia* suggests something of an elixir that protected against all the ills of the body; and this suits well enough with the herb's position in the mysteries, its link with the mother-goddess.[40]

We can now return to the pomegranate. Its connection with Demeter and Korē seems certainly to point back to a period before Demeter was a grain-goddess, to Minoan-Mykenean times. The archaic cult-image of Athena on the Athenian Akropolis held a pomegranate in the right hand; Polykleitos put a pomegranate into the hand of his Hera at Argo, and Pausanias remarks that he may not tell the reason. Near the great sanctuary of Hera at Paestum large numbers of terracotta pomegranates have been found. Trails then from Demeter, Hera and Athena all lead back to an ancient goddess of earth and under-earth.[41] Korē herself, though not at Eleusis, is shown with the pomegranate. The close link with the mystery-mother appears in the taboo against eating pomegranates or apples at certain feasts in Eleusis and Athens: at the Mysteries and at the Haloa (a winter-festival for women in honour of Demeter, Kore, and Dionysos, which was characterised by wine-drinking, obscenities, and veneration of genital symbols). At the Thesmophoria, another woman's festival held soon after the Great Mysteries, in which joy alternated with mourning, the women ate nothing but pomegranates, at least on one fast day; and they were forbidden to touch the seeds that fell to the earth.[42]

The pomegranate was not a fertility symbol (as appears in some

parts of modern Greece). It represents blood, the blood of murder and of the broken maidenhead. Clement says that the reason why the women could not pick up the seeds was because the tree had sprung from the drops of Dionysos' blood. Another legend tells how the tree sprang from the grave of Menoikeus at the gates of Thebes, where he killed himself to save the city. We are also told that a pomegranate tree grew from the grave of the Theban brothers, Eteokles and Polyneikes, who killed each other and one of whom died for the city like Menoikeus. Pausanias states:

> On the tomb of Menoikeus grows a pomegranate-tree. If you break through the outer part of the ripe fruit, you will then find the inside like blood. This tree is still flourishing. The Thebans assert they were the first men among whom the vine grew . . .[43]

There was also a connection between the pomegranate and the death of Attis. Initiates in the mysteries of Kybele and Attis were forbidden to eat the fruit; the priests of Attis bore pomegranates in their hands, as did their statues, or wore pomegranate-wreaths. Nana (another name for the Great Goddess) ate a pomegranate and conceived Attis; and the fruit was the pledge of immortality for the initiates. Agdistis (a bisexual or hermaphroditic form of the same Goddess) was castrated in her sacred legend; the tree sprang from her flowing blood. Here the female genitals with their menstruation are imagined as castrated male-genitals. The name of the tree in Boiotia and elsewhere was *sidē*. Sidē in myth was the wife of the hunter Orion and went on an underworld-journey; we also find her as a virgin who killed herself on her mother's grave to escape her father who sought to rape her—from her blood grew the tree. In an Orphic version Kore was raped by her father in snake-form. (The name *Side* was given to several cities: there we see Side as the fostering Mother.)[44]

In the passage cited above from Pausanias there was a direct transition from pomegranate to vine; and we have seen how the pomegranate was linked with Dionysos. Rhoio, the personified pomegranate, was daughter of Staphylos, the Grape (at least on Delos and Euboia); she bore Anios, who fathered Oino, Spermo, Elaïs, Wine-maid, Seed-maid, Oil-maid.[45]

We are thus brought back to the Kabeiroi with their *selinon* as the product of a mystery-murder, connected with both Dionysos and pomegranates. The whole complex we have examined makes more than likely that the craft-fraternities linked with the Great



Mother, Kabeiric, Korybantic, Daktylic, took over her plant-magic of death-birth and used it in their craft-rituals and processes to ensure the secure movement through critical moments of change, especially in metallurgy.

The theme of plant-magic is a vast one. Still, here we may find space for some examples from the book of Martianus Capella on the Marriage of Mercurius and Philologia. We hear of herbs used for apotheosis or immortality. One recipe is attributed to Demokritos of Abdera; Plinius cites a book of his on magic herbs. To save Philologia from being burned up in the fire of the celestial spheres, she is rubbed with an unguent, in the composition of which is a wonderful herb that seems the Hundred-headed Plant known to Plinius. This plant the latter connects with the Mages and the Pythagoreans; out of it were made a talisman, a love-phylactery, an electuary of beauty. Its use in Martianus Capella shows that it could protect against fire and thus live in it; a metallurgical link seems possible.[46]

Another passage describing how Philologia is immortalised and raised to the level of her divine husband also brings in a herb.

> When the goddess saw that she had drunk the cup of immortality, so as to teach her in some sort by the symbol [*aenigma*] of a fillet that she was leaving earth for heaven and that she had become immortal, she crowned the virgin with a certain meadow-herb that bears the name of . . . , while counselling her to reject all that which, as yet mortal, she had attached to herself as defence against the power from above; for, said she, there lay the inferior marks of a decayed and mortal essence.[47]

The name of the herb is not sure. It has been taken as *aeizoon* (everliving), but the MSS give *leizōs*, *leuzōs*, *leukōs*—in the last case with a gloss "a white herb like some lily". We may then take the name to be *leukos* or *leukas* (white) and link the herb with that called *candida* by Plinius. The interpolator of Dioskorides calls it *gorgoneion*; and Damaskios says the root is like "the maiden whose head is covered with snaky hair".[48] From Psellos we learn that the plant grew mostly under earth, but that it popped up to watch if a girl mated nearby. The interpolator of Dioskorides adds the synonyms of hundred-headed and *moly*. The talismanic *moly* in Homer was black-rooted and milky-flowered; but the variety known to Theophrastos and Dioskorides was yellow-flowered.[49] The name *leukos* suggests the promontory Leukas where Sappho

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was said to have leapt to her death. In the Pythagorean basilica at the Porte Maggiore in Rome where Sappho's ritual-leap of death-rebirth is depicted, a Victory stands above holding out a wreath and palm; and there is also in the basilica a winged Orante with a flower in each hand—the shape suggests a thistleflower.[50]

Plants and juices appear in alchemic texts, mostly in reference to the dyeing and colouring of materials. Thus, saffron seems used in a yellow dye-liquor for staining metal, which would later be lacquered. (Donne in his 8th *Elegie* wrote, "And like vile lying stones in saffroned tinne," and Van Helmont in 1618 described the Philosopher's Stone as "of colour, such as is the Saffron in its powder, yet weighty, and shining like unto powdered Floss".)[51] Plinius said the best variety of saffron was that of the crocus of Kilikia; and Apollonios of Rhodes compared the *prometheion* with this flower.[52] Among the juices applied to the surface of polished metal, beside that of the Kilikian krokos, was that of grapes, together with *elydrion*, a yellow dye-stuff.[53] "Make a wash as usual. Dye the silver out of petals till the colour pleases. If the petal is bronzen, all the better." Sometimes *krokos* may represent a mineral; we may compare *crocus martis*, ferric oxide. Pseudo-Demokritos remarks, "Saffron has the same action as copper." *Anagallis*, generally translated as pimpernel, seems cited by Demokritos for a yellow dye. Its character for dye-uses is confirmed by its appearance among other materials in a work by Moses. Demokritos also mentions Pontic rhubarb, *rha*, as a material for producing dye-liquor. The root in fact has a deep yellow colour through its chrysarobin. (Synesios was puzzled by this passage, thinking that Demokritos intended an analogy between the river Rha flowing into the Pontic Sea and the liquefaction of a solid.)[54] A recipe from the Stockholm chemical papyrus is of interest as using both mercury and poppy-extract:

> To make silver: purchase coals such as coppersmiths use and steep them one day in vinegar. Then take an ounce of copper, fix it well with alum, and melt in this condition. Then take 8 ounces of mercury and empty it into poppy-extract. Take also 1 ounce of silver, and having incorporated these ingredients together, melt. (Recipe 8).

Incense and resin (called *opos*, juice) appear in a recipe for automatic fire to be used in warfare. The text, which cannot be earlier than 550 A.D., is given in a manuscript of Julius Africanus:



> Automatic fire is made up of equal parts of native sulphur, rocksalt, incense, thunderbolt stone of pyrites, ground in a black mortar in the noon-sun, and mixed with equal parts of the juice of the black sycamore and liquid asphalt of Zakynthos into a greasy paste. Then some quicklime is added. The mass must be stirred at noon with care and the face kept protected, as the composition easily enflames. It must be put in bronze boxes with tight covers, protected from the sun's rays till wanted. If the engines of the enemy are to be burned, they are smeared with it in the evening, and when the sun rises they'll be burned.[55]

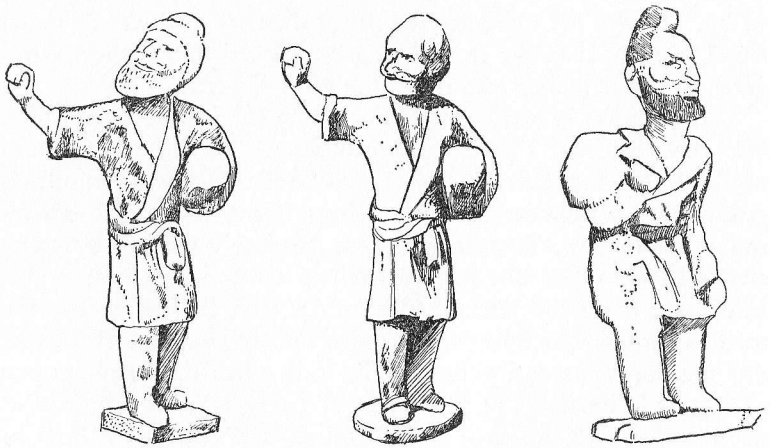
The idea of the Elixir is not as strong in Graeco-Roman alchemy as it is in Arab and Western medieval developments. But it is present and turns up now and then: for example, "Good preparation and completion of the Created Thing and of the Work and Long Duration of Life."[56]

There is thus no reason why the use of certain plant-juices in metallurgical craft-magic might not have given the name to alchemy; but we have no evidence on the philological side for the early phases of this development. In Arabic, *kimiya* was used both for a substance and for an art. But as it came to be used mainly for the latter, the synonym *iksir* was kept for the substance: hence our *elixir* from *el iksir*. In Greek the substance was *chymos*, with *chymia* apparently an abstract formation from it. But there is no sign of the word *chymos* having been used for a transformative agent; in alchemy that role was played by the divine water, mercury, and so on. Despite the evidence for magical herbs or juices in craft-ritual, we are then far from being convinced that *chymos-chymia* gives us the sequence leading to the term alchemy.

The situation is further complicated by the intrusion of China into the problem. There the words *Huan-Tan* and *Chin-I* were used for alchemy. *Chin-I* or *Jin-Yi* has been translated "goldfluid, goldjuice, gold-sperm", which brings it into line with *chymos* rather than *chyma*. The *Lie-sien Yuan* (probably written by some alchemist between A.D. 200-420) tells a tale of how Master Ma Ming got from the ancient Master An Ch'i the recipe for the medicine *jin-yi*, which he compounded on Mt Hua-yin. However, not wanting to ascend to heaven, he took a half-dose and became an earthly immortal. The poet Shen Yo (441-513) sang: "I want to get a tablet with the *jin-yi* recipe, which will inform me how to grow wings." And the T'ang emperors gave the name *Jin-Yi* to the audience hall in their main palace. The pronunciation of

of *jin-yi* in T'ang times would be *ki'm-iäk*; and it is also claimed that *Chin-I* in Southern China would be pronounced *Kim-Iyah* or *Kem-Iyah*, the *I* in *Iyah* meaning fresh plantjuice as well as fluid; and that therefore the Chinese *Chin-I* or *Jin-Yi* is the origin of the Arabic *Kimiyah*. Similarly it is claimed the *el iksir* comes from a Chinese phrase pronounced *iak-ts'i't* in T'ang times—now *yi-jzh*; this phrase denoted the substance of a fluid secretion.[57]

What are we to make of all this? There is scant evidence for a metallurgical type of alchemy in early China, despite the great importance of the bronze industry. The notion of an elixir however does seem to go well back into the pre-Christian age. When we consider the abundance of evidence for metallurgical alchemy in the Hellenistic world, in an area reaching from Mesopotamia to Egypt, and when we consider how essential for the maturing of alchemic theory was the background of Greek philosophy and mystery-religion, it is incredible that the system should have been imported from China via India and the pre-Islamic Arabs. *Chymos-chyma*, with or without its Egyptian associations and fusions, lies firmly in the bed of the ancient Greek language; and it is hard to see what can disturb its claim to have provided the basis from which the *chēmeia-chymia* of Zosimos came (about A.D. 300). To suppose that a similarly-sounding Chinese term, with exactly the same meaning, came into the Greek-Egyptian spere via Indians and early Arabs is to enter a



9. Travelling merchants in China: three T'ang figurines showing Semitic, Persian, and Western types



philological madhouse. There is no space or need here to discuss the early relations of China and the Iranian-Mesopotamian area. But one example may be cited. About 1,000 B.C. horn-rhytons were being turned out by Iranian craftsmen; a doe-headed one appears on a Sassanid silver dish; a Chinese stone-relief of the 6th century A.D. shows a horn-rhyton of the Iranian type being used. Trade-relations along the steppe-lands or via South-East Asia certainly have an indefinitely ancient history.

Not that it is irrelevant for us to explore Indian and Iranian culture for plant-lores. Those lores shed light on the general background of alchemic origins. The Indian Buddhist *Avatamska Sutra* (dated 2nd to 4th century A.D.) states, "There exists a Hataka juice or essence. One liang of this solution can transform a thousand liangs of bronze into pure gold." The *Mahaprajna-paramitashastra* of Nagarjuna (translated into Chinese in the 4th century) counts among the *siddhi* or miraculous powers the transmutation of "stone into gold and gold into stone". The change can be brought about by herbs or by yoga. The *Mahaprajnaparamitopadesha* (translated into Chinese in the early 5th century) says, "By means of drugs and incantations one can change bronze into gold. By a skilful use of drugs, silver may be transformed into gold and gold into silver. By spiritual strength man can change clay or stone into gold."[58] In the myth of Indra's dismemberment the divine body, intoxicated by an excess of *soma*, began to "flow out", giving birth to every creature, plant, and metal. "From his navel the lifebreath flowed out and became lead, not iron, not silver; from his seed his form flowed out and became gold."[59]

Alberuni in the 11th century stated that the Hindus "have a science similar to alchemy which is quite peculiar to them. They call it Rasayana. It means the art which is restricted to certain operations, drugs, compounds, and medicines, most of which are taken from Plants. Its principles restored the health of those who were ill beyond hope and gave back youth to fading old age." A writer on Cutch in 1839 said that all the folk there "believe in the possibility of obtaining eternal youth and unwasting riches by means of the Waters-of-Life (which corresponds with the Persian term *Abe-Hayat*) and the Philosopher's Stone (*Hajre Mukurran*, a substance best developed by the Muslim alchemists) and many Indian works contain grave treatises on the best means of seeking them."[60] We are told that originally "the term was

*Ayushyani*, or the securing of long life and health, which occurs in the *Atharva-Veda* and was converted later into *Rasayana* which is practically equivalent to alchemy. Even in the *Atharva-Veda* gold is regarded as the elixir-of-life, and thus [that work] can be said to be the first book of Knowledge of medicine and alchemy in ancient India."[61] *Rasayana* seems at the outset a herbal drug or elixir; it appears as such in the epic *Mahabhārata*. Later it came to mean mercury or a mercurial substance, then alchemy as a whole. We may thus say in general that in the earlier Indian phases we find elixirs and herbal substances believed to own immortalising powers; the aspect of transmutation of metals may come in later through the Arabs—though there may well have been in India from the first centuries of metallurgical activity some sort of primitive alchemy. Much the same picture seems to exist in China, where the main emphasis is also on the elixir.[62]

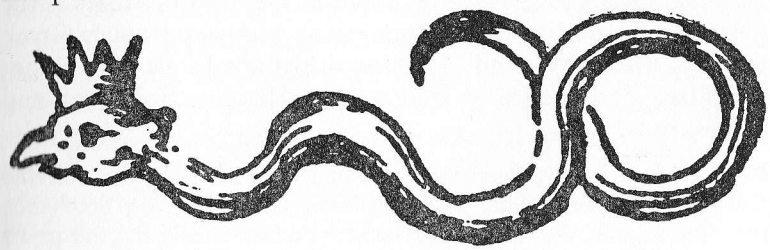
Indian and Iranian ideas and myths were closely connected. It is enough for us here to note that fact without entering into the question of which influenced which, and in what way. We are concerned with the general way in which the Iranian-Indian complex lay behind the alchemic world-outlook in Graeco-Roman days. In Persia the primordial man, Gayomart, murdered by the corruptor, "allowed his seed to flow over the earth"—just as Indra did. As his body was composed of metals, the seven basic kinds thus flowed out.[63] We are also told that at his death eight minerals came from his limbs: gold, silver, iron, brass, tin, lead, quicksilver, and diamond. "Gold, in virtue of its perfection, issued from actual life and from the seed."[64] The diamond there seems intrusive. From Gayomart's seed, purified by the heaven's rotation, was born the first human couple in the form of a rhubarb-plant.[65] Gold and the human essence were thus closely linked.

In Persia the *haoma*-plant played much the same role as *soma* in India. It was an elixir, with a stock epithet: "from whom death flees". The *haoma* rite was the central liturgical act of Zoroastrianism. The sacrifice was twice performed. At its first preparation it was accompanied by the offering of sacred bread, which was ritually consumed. The *Haoma Yasht* was recited: hymns in praise of the divine plant. The priests alone drank the sacred liquid. Then came the profession of faith acknowledging Ahura-Mazda as the Good Lord. After three most sacred prayers came the second preparation of *haoma*, its consecration and consumption, with the laity now invited to share. The sacrifice of the plant



was an act of communion. The plant itself was identified with the Son of God, who was bruised and mangled in the mortar so that the lifegiving fluid from his body might give new strength to the worshipper. (*Haoma* seems to have been a plant like our rhubarb, which grows to this day in the Iranian mountains.[66] We have noted the use of rhubarb with its deep yellow roots in alchemy, where it had value as a dye giving a golden effect and was thus considered as owning transmutative powers.) The way in which mankind and the plant were identified in the processes of juice-production was exactly paralleled by the way in which mankind and the metals were identified in the alchemic processes, as we shall see when we come to the visions of Zosimos.

It is clear then that ideas of the elixir entered into the myths and images of metallurgical transmutation in Greece as well as elsewhere; but without more definite etymological evidence it would be rash to deprive *chēmeia-chymia* from *chymos* rather than *chyma*. It is best to suppose that at the early stages there was no very clear differentiation between juice-extraction and smelting or alloying. That is, all the processes were felt to have deep-going analogies which made them in the last resort expressions of a transmutative process. That was how *chymos*, *chylos*, and *chyma* all emerged from the root shown in *cheein*, "to pour out". In later stages the notion of the unity in the processes weakened, but was never obliterated. Ideas and imagery from plant-magic flowed in on those from metallurgical craft-magic, and *vice versa*. Probably the metallurgical *chyma* dominated in the formation of the general term *chēmeia-chymia* for chemical activity, plus influences from the Egyptian *km*. That seems as far as we can go in unravelling this difficult etymological knot—the very difficulty of which, however, enables us to penetrate into the complex origins of alchemic ideas and practices.



10. Chinese symbol of Yang-Yin: hermaphroditic, as the cock is male, the snake female

# 5

# Demokritos and Bolos of Mendes

Now we come to the alchemists themselves. If we look at the manuscripts, we find them lavish with names, but with no historical reliability.

Exposition of the Rules of Goldmaking, beginning with the names of the exponents. Hermes Trismegistos wrote first on the Great Mystery. He was followed by Johannes, Archpriest of Tuthia in Euagia and the sanctuaries there found. Demokritos, the celebrated philosopher of Abdera, spoke after them as well as the excellent prophets following. Then the very wise Zosimos is named. These are the oecumenical and famed philosophers, the commentators of the theories of Plato and Aristotle. Olympiodoros and Stephanos, having made researches and discoveries, wrote great accounts of the goldmaking art. Such were the very wise books, the authority of which is going to guide us.[1]

Omitting Hermes and Johannes, this account is fairly sober. But we also get hasty lists:

Names of the Philosophers of the Sacred Science and Art. These are: Moses, Demokritos, Synesios, Paseris, Pebichios, Xenokrates, Afrikanos, Loukas, Diogenes, Hippasos, Stephanos, Chimes, the Christian, Maria, Petasios, Hermes, Theosebeia, Agathodamion, Theophilos, Isidoros, Thales, Herakleitos, Zosimos, Philaretes, Juliana, Sergios.[2]

Here Hermes is relegated low down in the list and Moses is the great founder leading on to Demokritos, with famous early Greek thinkers like Thales and Herakleitos in the tale. In yet another list Plato and Aristotle lead on to Hermes, Johannes and Demokritos.

Plato and Aristotle, Hermes, Johannes the Archpriest in divine Euagria, Demokritos, the great Zosimos, Olympiodoros, Stephanos the Philosopher, Sophar the Persian, Synesios, Dioskoros the priest of great Sarapis at Alexandreia, Ostanes and Komarios initiates of Egypt, Maria, Kleopatra, wife of King Ptolemaios [XII] Porphyrios,



Epibechios, Pelagios, Agathodaimon, the emperor Heraklios, Theophrastos, Archelaos, Petasios, Klaudianos, Anon, Menos, Panseris, Sergios. These are the Master everywhere famed and oecumenical, the new Commentators on Plato and Aristotle. The Places where the divine work is accomplished are Egypt, Thrace [? Byzantion], Alexandreia, Cypros, and the Temple of Memphis.[3]

The manuscript must date from long after the temple of Sarapis had been razed and that of Memphis also destroyed; but it repeats ancient traditions. To claim Plato and Aristotle as ancestors was not altogether untrue; for many aspects of the alchemic cosmogony went back to their work. In joining Hermes or Orpheus with famous Greek thinkers or poets (Hesiod, Aratos) the compilers were probably expressing a genuine confusion in part, in part seeking to raise the prestige of their art. Such agglomerations were not unusual at the time. The Sethean Gnostics mingled Biblical themes with Orphic mysteries. Further, no one wanted to claim originality. The more one could shelter behind the great names, the safer one felt. Whereas apologists today seek to stress the new elements in the Christian dispensation, a writer like Eusebios in the 4th century A.D. goes out of his way to insist that there is nothing new whatever in it:

This must suffice as introduction to my story proper. It was necessary in order to guard against any inclination to think of our Saviour and Lord, Jesus Christ, as novel, because of the date of his sojourn in the flesh. But to prevent anyone from imagining that his teaching was either new and strange, as being put together by a man of recent date, no different from his fellows, let us now deal briefly with this point . . .

Thus the practice of religion as communicated to us by Christ's teaching is shown to be not modern and strange, but, in all conscience, primitive, unique, and true.[4]

We cannot do better than begin our quest by considering the role of Demokritos in the alchemic tradition. There, what are called the works of Demokritos seem almost wholly the products of Bolos of Mendes; but there could not have been such a use of a great philosopher's name unless he was felt to have some close affinity with the alchemic worldview. We have already had some glimpses of Bolos-Demokritos from the pages of Columella and Plinius; and at times in the stories that are told, and the attributions that are made, it is hard to be sure whether we are dealing with Bolos or the 5th-century philosopher.

Today Demokritos is mainly recalled as the founder, with Leukippos, of the atomic theory. According to this theory all bodies are made of atoms, which are complete, indivisible, simple, eternally existent in empty space, but differing in form and magnitude, with proportional weight. All change comes through combinations or dissociations of atoms in a purely mechanical way. If we think we see a distant action, there in an intermediate medium transmitting it. Atoms are caught in a whirling movement, which brings about their combinations. The soul is made of round tenuous atoms of the igneous kind; they keep on trying to escape, but breathing renews their number. Sensations imply a direct contact with objects or their emanations. All this (apart from the role of breathing and the concept of ceaseless movement) seems very far from alchemy, which, perhaps on account of the difficulties of finding ways to weigh atoms, never made any attempt to apply or develop the atomic theory in dealing with its problems.

But Demokritos was interested in much more than atoms. The works that he or his school wrote formed a sort of encyclopedia analogous to the collection of treatises under the name of Aristotle. They were classified and gathered together by the grammarian and astrologer Thrasyllos under whom Tiberius studied at Rhodes and who accompanied his master to Rome. He is named in Juvenal's sixth satire, just before Petosiris. Now only a few fragments of the collection survive. But we are told that its contents included works on ethics, natural science, mathematics, astronomy, music, poetry, rhythm and poetic beauty, Homer, linguistics and grammar, medicine, agriculture, painting, mythology, history. Diogenes Laertes mentions works on the sap or juice of plants, as does Petronius; on stones, minerals, colours, metals, glass-tinting. Anecdotes describe Demokritos' incredible diligence, and he is said to have died in poverty. Diogenes says that he was esteemed, not only for philosophy, "but because he had foretold some things that the events proved to be true," and adds that he died at the age of 109. He was called the Smiling Philosopher, laughing at the follies of men; his aim was *euthymia* or peace of mind through abstinence and moderation. Plinius says, "Demokritos condemned Venus as the act by which one human being springs from another."[5]

Legends seem to have gathered fairly soon around him, so that it is hard to say where the fantasies about the atomist end and begin to merge with the fantasies about the alchemist. He belonged to



Abdera, an Ionian colony from Teos founded in the 5th century B.C. But we also find him called a Milesian and his father's name is variously spelt. He travelled widely and was thought to have reached even India and Aithiopia; he wrote of Babylon and Meroe.[6] Diodoros says that the Egyptians asserted that "Demokritos also [as well as Pythagoras] spent five years among them and was instructed in many matters relating to astrology." Diogenes, perhaps basing himself on Antisthenes (almost a contemporary of Demokritos), says that he learned geometry from the priests of Egypt and visited Persia and the Red Sea. Theophrastos mentions him as a man who had visited many countries; and according to Clement he declared that no man of his age had made greater journeys or met more men distinguished in every kind of knowledge, mages and priests. Among the latter he cited the Egyptian geometers, *arpedonaptai*.[7]

It is certain then that he was an adventurous and striking character; of the sort likely to attract legends; and presumably it was his interest in stones, minerals, colours, dyes, that in large part drew the alchemists to him. A citation by Theophrastos shows him interested in fire and colour. "Iron and other bodies are brighter when they contain more fire of higher tenuity, and are redder when they contain little fire in a coarser state. Thus, redder bodies are less hot." He seems to be establishing a relation between colour and temperature.[8] Theophrastos himself was much concerned with metals, stones, plants, and perfumes; but he was never claimed by the alchemic tradition.

We can read Demokritos' bold and untrammelled character in various sayings of his which have come down and which seem authentic.

Man must know that he is far removed from how things really are.

And it will be clear that it is most difficult to know how each thing is in reality.

As things stand, we perceive nothing that is reliable, but only what changes according to our constitution and to the onrushing or counteracting patterns.

I alone know that I know nothing.

The wrongdoer is more unfortunate than the man wronged.

Culture is an adornment for the fortunate and a refuge for the unfortunate.

To a wise man the whole earth is open; for the native land of a good soul is the whole earth.

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Poverty under democracy is as much to be preferred to so-called prosperity under an autocracy as freedom to slavery.

People are fools who hate life and yet wish to live through fear of Hades.

One must not respect the opinion of other men more than one's own; nor must one be more ready to do wrong if no one will know than if all will know. One must respect one's own opinion most, and this must stand as the law of one's soul, preventing one from doing anything improper.

A year without feasts is like a long road without inns.

Man is a universe in little.

Nature and instruction are similar; for instruction transforms the man, and in transforming, creates his nature.

Aristotle was outraged at the way in which Pythagoreans and Demokritos were obsessed with mathematical combinations or with "the concurrence and entanglement" of bodies. "They say there is always movement. But why and what this movement is they do not say, nor, if the world moves in this way or that, nor do they tell us the cause of it doing so."

Now let us look at some of the things that Plinius says about Demokritos, and find if we can distinguish legend from fact. Thus, we are told that Pythagoras, Empedokles, Demokritos, Plato, went overseas to learn the magian lores.

Democritus expounded Apollobechis the Coptite [of Koptos] and Dardanus the Phoenician, entering the latter's tomb to obtain his works and basing his own on his doctrines. That these were accepted by any human beings and transmitted by memory is the most extraordinary thing in history, so utterly do they lack credibility and decency that those who like the other works of Democritus deny that the magical books are his. But it is all to no purpose. It is certain that Democritus in particular distilled into men's minds the sweets of magic. Another strange thing is that both the arts of medicine and magic flourished together, Democritus expounding magic in the same age as Hippocrates medicine.[9]

Loukian further colours the tradition of tomb-frequenting. In his *Lie-Lover* he writes on the subject of ghosts:

"A very wonderful man that Demokritos," said I, "the Abderite, who it seems was completely convinced that nothing of the sort can exist. He shut himself up in a tomb outside the gates and continually wrote and composed there night and day. Some of the young chaps, wanting



to annoy and alarm him, dressed up like dead men in black robes and skull-patterned masks, encircled him, and danced round and round in quick time, leaping into the air. Yet he neither feared the travesty nor looked up at them at all, but as he wrote he said, 'Stop your fooling!' So firmly did he believe that souls are nothing after they have gone out of their bodies."[10]

What lies behind these tales appears to be some experiments that Demokritos made on what he called *eidola*: images (a term also used for ghosts). Ploutarch tells us that like Epikouros he explained dreams as the result in general of *eidola* which were ceaselessly emitted by objects of all sorts, including living bodies, and which penetrated through the pores of the sleeper. Demokritos (though not Epikouros) considered that the *eidola* carried representations, *emphaseis*, of the mental activities, thoughts, characters, emotions of the person from whom they came. "And, thus charged, they have the effect of living agents. By their impact they communicate and transmit to the recipients the opinions, thoughts, and impulses of their senders, when they reach their goal with the images intact and undistorted." Distortions or weakness of impact could arise through the weather, through frequency of emission, or through the initial velocity. "Those that spring out from persons in an excited and inflamed condition yield, owing to their high frequency and rapid transit, particularly vivid and significant representations."[11]

In this passage Ploutarch deals only with dreams; but Demokritos certainly thought that the *eidola* could impact on others than sleepers; for elsewhere Ploutarch mentions that he explained the evil-eye on the same principle. The sender used *eidola* charged with a hostile and harmful content.[12] So it seems that the emission of *eidola* was a continuous process, which under certain conditions could assume a special strength and velocity. Apparently then Demokritos went to tombs or deserted places to try out the effects of *eidola* there on his mind and senses. Diogenes Laertes says: "He would train himself, asserts Antisthenes, by a variety of means to test his sense-impressions by going at times into solitude and frequenting tombs."[13] We see then that, though a consistent materialist, he was extremely interested in strange phenomena, in occult forces, which he believed had a physical or scientific explanation if enough was known about them. Probably indeed it was this mixture of attitudes that drew the alchemists to him—an ardent quest for definite explanations, and an open mind

towards forces of sympathy and antipathy, attraction and repulsion, which acted at a distance and could not yet be explained: together with an omnivorous curiosity and persistence of research.

The tales in Plinius and Loukian, it then appears, have a certain connection with the historical Demokritos; yet they contain legendary elements such as we shall find when we discuss Dardanos and Apollobechis. Why did such legends thicken round Demokritos? And what were the stages by which they arose? It is hardly enough to say that they were created after Demokritos has been taken over as a hero or a disguise by the alchemists. Plinius is completely convinced that the atomic philosopher was a thorough-going devotee of magian ideas and practices; and he is not so uncritical as to be thus taken in unless there had been a long accumulation of legendary confusions. No doubt the core of those confusions lay in the work of Bolos of Mendes. What then of this man, who took the name of Demokritean and also was either mistaken for Demokritos or else hid himself behind that philosopher's name—in homage or in an alchemic system of secrecy? The Byzantine dictionary called the *Souda* tries to distinguish two men called Bolos, one a Pythagorean concerned with sympathies and antipathies, the other a Demokritean, who wrote on medicine and history. But this is unlikely. Columella seems to know only one Bolos; and Stephanos of Byzantion, dealing with Apsynthios, a town in Thrace, adds that Bolos the Demokritean cited Theophrastos' *Book of Plants* for the statement that "the cattle in Pontos cropping a plant with the same name lack galls". Columella says that Bolos wrote on sympathies and antipathies, and calls his books *cheirokmeta*.[14] Vitruvius, dealing with methods of distinguishing silver mixed with gold, adduces Archimedes' experiment with the displacement of water and Eratosthenes' method for calculating twice the cubic content of Apollo's altar at Delos. He speaks of the pleasure to be got from considering such inventions, and remarks that he cannot help admiring "the works of Demokritos on the Nature of Things and his Commentary entitled *Cheirokmeta*, wherein he sealed with a ring, on red wax, the accounts of those experiments he had tried out".[15] *Cheirokmeta*, however, seems to mean "artificial substances": that is the meaning we find for *cheirokmetos* in Aristotle—and so the attempt to link it with hand-sealing is an error. It seems indeed from the letter from Zosimos to his sister cited earlier that *cheirokmeta* had a special meaning for alchemists.



Zosimos calls his fellows "those who give themselves up to the quest for *ta cheirokmeta*"—metals produced by the art, not those just dug up from the earth. But we are still left with the problem whether both Demokritos and Bolos wrote works with this title, or whether Vitruvius is confounding Bolos with Demokritos.[16]

Now let us look at Plinius on the author of a book about plants, whom he considers Demokritos. This author he consistently links with the mages of Persia. In a section on Wonder-Plants, he says that he will start with the Magical. "They were first brought to the notice of our part of the world by Pythagoras and Democritus, who followed the Magi as their authority." He goes on about two plants that Democritus says congeal water, another used in fomentation against snakebite, and a root that catches fire at a distance like naphtha.[17]

That Democritus was the author of a book called *Cheirokmeta* is a well-attested tradition. Yet in it this famous scientist, the keenest student next to Pythagoras of the Magi, has told us of far more marvellous phenomena. Thus, the plant *aglaophotis* [brightlight ? peony], which got its name from men's wonder at his magnificent colour, being native to the marble quarries of Arabia on the Persian side, is called *marmaritis*. The mages use it when they want to call up gods.

The *achaemenis* is of an amber colour, leafless, found among the Taradastili of India; criminals, on drinking it in wine, confess all their misdeeds because they suffer tortures from divers phantoms of spirits that haunt them; Democritus also called it *hippophobas* since mares have an extreme aversion from it.

*Theombroton* [godfood] grows 30 *schoeni* [each about 5 miles] from the Choaspes, like a peacock in its hues and very finely-scented. He says the Persian kings take it in drink for all their bodily disorders as well as for instability of intellect and of the sense of justice (?); and that it is also called *semnion* [solemn, august] from the majesty of its power.

He also mentions another plant, the *adamantis* [unbreakable], native of Armenia and Cappadocia; if set near lions, they lie on their backs and wearily yawn. The reason for the name is that the plant cannot be crushed. Ariana is named as home of the *arianis*, a fire-coloured plant; it is gathered when the sun is in the Lion and pieces of oil-soaked wood catch fire at its touch. The *therionarca* [beast-numbing], growing in Cappadocia and Mysia, makes all wild beasts turn torpid so that they can't be revived unless sprinkled with hyena-piss. The *aethiopis* grows in Meroe, so its other name is Merois. It has the leaf of a lettuce and is very good for dropsy if taken in honeywine.

The plants here cited do indeed show a strong Persian aspect, in their names, places of origin, and magical uses. Note how many are connected with some sort of possession. The way in which names beginning with A and TH dominate suggest that he was glancing at the start of a work with the items alphabetically arranged. The *aglaophotis*, we may note, is a flower of the storm-raising and maddening series to which the *prometheion* and the mandragora belonged.[18] Fire-elements appear in the inflammable root and in *arianis*. Plinius goes on, using indirect speech to make clear he is citing his author and taking no responsibility for the statements.

The *ophiusa* [snakeplant] grows in Elephantine, also part of Ethiopia, a plant livid in colour and revolting to look at. Taken in drink, it causes such terrible visions of menacing serpents that fear of them drives men to suicide. So those guilty of sacrilege are forced to drink it. Palmwine is an antidote. The *thalassaegle* [seabright] is found along the river Indus and is so called from *potamaugis* [rivergleam]. Drunk, it makes men rave while weird visions beset their minds. *Theangelis* [godmessenger ?] grows on Mt. Lebanon in Syria, Mt. Dicte in Crete, and Babylon and Susa in Persia; the mages take it to drink so as to become divine.

*Gelotophyllis* [laughterleaved] grows in Bactria and along the Borysthenes. Taken in myrrh and wine, it makes all sorts of phantoms haunt the drinker, provoking laughter that keeps on till pinenut kernels are taken with pepper and honey in palmwine. *Hestiateris* [hearthplant] is Persian, so named from its promotion of goodfellowship, as it makes the company gay; it is also called *protomedia* [Median headship] from its use to gain the highest position at Court; *casignete* [sisterplant] as it grows only in companionship with its own species and not with any other plants. *Helianthes* [sunflower] is the name of a plant with myrtle-like leaves, growing in the district of Themiscyra and on the mountains along the Cilician coast. A decoction of it in lionfat, with saffron and palmwine added, is used as ointment by the mages and by the Persian king to give the body a pleasing look; hence its name *heliocallis* [sunbeauty].

He gives the name of *hermesias* to an agent for procreating handsome and good children. This isn't a plant but a compound of ground kernels of pinenuts with honey, myrrh, saffron, and palmwine, and with the later addition of *theombroton* and milk. He prescribes a draught of it for those about to become parents, after conception, and to nursing mothers; thus are born children excelling in mind and body as well as good. Of all these plants he adds also the magical names.[19]



Elsewhere he links Demokritos and Pythagoras. The latter, he says, first composed a book on plants, assigning his discoveries to Apollo, Aesculapius (Asklepios), and other gods.

Democritus composed a similar work. Both men visited the Mages of Persia, Arabia, Ethiopia, and Egypt; and so amazed were the ancients at these books that they positively made even incredible statements. Xanthos, historian, relates in his first book that a young snake, killed, was restored by its father, using a plant that Xanthos calls *balis*, and that the same plant revived Tylo, whom the snake had killed. Juba too records the resurrection of a man in Arabia through a plant. Democritus stated, and Theophrastus credited him, that there was a plant, which, carried by a bird I have mentioned, forced out by its touch a wedge driven into a tree by shepherds.[20]

He adds that "most authorities hold there is nothing that cannot be achieved by the power of plants, but the properties of most are still unknown". Tylon is a divine youth and reminds us of the Cretan Glaukos, son of Minos, who was similarly healed by a herb that a snake had used. There are strong traces of initiation-ritual and myth in these tales. Plinius is fiercely anti-magian and never loses a chance to stress how fantastic or repulsive is magian magic. We shall hear more of what he has to say on the subject when we come to Ostanes.[21] For the moment here is what he says of Asklepiades of Bithynia, who came to Rome early in last century B.C. "Above all he was helped by magian deceits, which prevailed to such a degree that they were strong enough to destroy confidence in all herbal remedies. It was believed that the plant *aethiopis* dries up rivers and pools; that *onothuris* opens anything shut; that *achaemenis*, thrown into the ranks of an enemy, makes their lines turn their backs in panic." Two of these herbs are among those of whom Demokritos wrote.[22]

Bolos then seems to be shown as earlier than Asklepiades; and we may add that he seems earlier than Anaxilaos of Larissa, who is mentioned in the Stockholm papyrus and who flourished about 28 B.C.

Another recipe: Anaxilaos relates this also to Demokritos: Pound some common salt into a fine powder together with schistose alum, with acid, make pellets of it. Let them dry three days in a bathroom. Then pound them afresh, fuse copper with this powder, three times, and cool and refresh it with seawater. The trial will bring out the quality of the product.

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There were several other writers on plants. Bolos may have used plant-material in apocryphal works under the name of Zoroaster, Ostanes, and other mages. Then there was Pamphilos of Alexandreia (1st century A.D.) with a *Peri Botanōn* in six books, which, Galen tells us, gave the incantations to be spoken when gathering herbs; it also indicated the use to be made of talismans, libations, and fumigations in dealing with plants.[23]

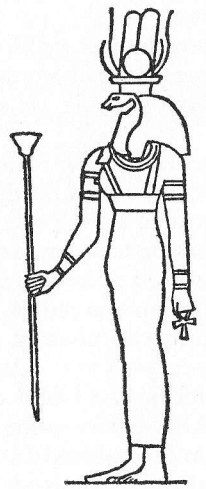
But though Bolos was clearly much interested in plant-magic, his main claim to fame lies in his position as the founder of alchemy. He must have drawn together the many allied strands of thought and practice concerned with transformative processes, and given them a unity which they had not previously attained. But exactly what that unity was, and how far he developed the theory of alchemy, it is hard to determine. Presumably his main alchemic work lies behind the *Physika and Mystika*, which survives only in fragmentary form in the MSS.[24] Let us consider its contents. It opens flatly with two recipes for purple dyeing. Then comes a passage more suitable for a preface, in which Demokritos invokes the shade of Ostanes. After that we get ten goldmaking recipes, a short polemic against the "young" (*neoi*) who won't believe in the virtue of the art. The polemic, addressed to the colleagues, *symprophetai*, of the writer, makes a sort of conclusion. "There then is enough said on the dry tinctures and on the attention that should be paid to the scripture." It is followed, however, by three goldmaking recipes, of which the last is addressed to Pammenes, who has taught the Egyptian priests. "It is up to this point, that in the *Physika* the matter of goldmaking goes."[25] Then comes a theoretical statement, that a single species suffices for the production of a multitude of effects. We pass on to silvermaking, which ends the manuscript. Nothing is said of tinting precious stones. (The title *Physika and Mystika*, cannot be simply translated *Physical and Mystical Matters*; for *physika* here refers to the hidden forces in nature. It is equivalent to *physikai dynameis*, with special reference to sympathies and antipathies. The *anēr physikos* was the man who in the hellenistic epoch was learned in occult relationships and forces; he was a mage.[26] Bolos seems to have founded the genre of *Physika*.)

The complete text was much larger than our fragments. Synesios in the 4th century states: "After getting his impetus from Ostanes, Demokritos composed Four Books on Tinctures, *bibloi baphikai*, on gold, silver, stones, purple."[27] The same



position is implied by the title of a treatise that Demokritos is said to address to Leukippos: "Fifth Book of Demokritos."[28] (It is odd that the alchemists, who do not try to make use of the atomic theory, thus go out of their way to link their Demokritos with the other atomic philosopher. Bolos-Demokritos says to Leukippos: "I have made use of enigmas, but they won't hold you up, you physical scientist who know all things.") There are also some indications in the diction of the MS that the compiler was working under the empire. The work *klaudianos* is used to denote a substance that seems a mineral, not an alloy; but whatever the material, the term can hardly be earlier than the reign of Claudius.[29] (An alchemist Klaudianos appears in a list of goldmakers; and we meet a moonbook of Klaudianos in a magic papyrus.)[30] Further a plant *laccha* is cited, the roots of which serve for tinting in red. Normally this plant is called *anchousa*. *Laccha* is a term borrowed from India, and is not found again till the 8th century (*lacca*). Presumably it had come in through the trade-links with India in the 1st and 2nd centuries A.D., which were responsible for the statuette of the goddess Lakshmi found at Pompeii.[31]

We may add the point that the compiler already feels a conflict between the old and the new schools of alchemy. The young school is rejecting a manual that has become sacred to the



11. Urt-hekau, the Cobra goddess of magical spells

traditionalists; and we can only assume that the manual in question was the original and complete work of Bolos.

Somehow that manual seems to have been lost and its place taken by the fragmentary *Physika and Mystika*, which all the later alchemists know and cite, and which itself cites only one Egyptian worker in the art, Pammenes, together with the mage Ostanes. It is surprising that there is no reference to Hermes, Agathodaimon, Isis, Kleopatra, or Maria. We assume that the author uses works written under the names of Ostanes, but knows none of the many treatises composed in the first couple of centuries A.D.

Bolos-Demokritos tells us at the outset that he came to Egypt to teach *ta physika*—though our text keeps only a displaced fragment of this preamble, "Yes, I too came to Egypt. I brought with me the lore of occult virtues, so that you might rise above multiple [diffused] curiosity and confused materials [or matter], *hylē*". Then after dealing with the *physika* revealed by the philosophy (alchemy) he recounts:

After learning these things from the master named Ostanes and aware of the diversity of the matter, I set myself to make the combination of natures. But, as our master had died before our initiation was completed and we were still all taken up in learning the matter, it was from Hades, as one says, that I tried to evoke him. I applied myself to the task, and, as soon as he appeared, I apostrophised him in these terms, "Are you going to give me nothing in return for what I have done for you?"

I spoke in vain. He kept silent.

However when I addressed him as well I could and asked him how I should combine the natures, he told me that it was difficult for him to speak; the *daimon* wouldn't allow it. He said only, "The books are in the temple."

Turning back, I then went to make searches in the temple on the chance of being able to lay my hands on the books. For he had said nothing about them while alive and he had died intestate—according to some, through using a poison to separate soul from body; according to his son, through swallowing a poison by mistake. And he had taken precautions before dying that no one should know of the books except his son on reaching maturity. So none of us knew anything of the matter.

But despite all our searching we found nothing; and so we gave ourselves a terrible lot of trouble in trying to learn how substances and natures were united and combined in a single substance. Well, when we had realised the synthesis of matter, some time passed by and a festival was held in the temple. We took part, all of us, in a banquet.



Then, as we were in the temple, all of a sudden a column of its own accord opened up in the middle. But at first glance there seemed nothing inside. However [the son] Ostanes told us that it was in this column his father's books had been placed. And, taking charge of the situation, he brought the thing out into the open. But when we bent to look, we saw in surprise that nothing had escaped us except this wholly valuable formula which we found there. "A nature is delighted by another nature, a nature conquers another nature, a nature dominate another nature." Great was our admiration for the way he had concentrated in a few words all the Scripture.[32]

He seems to mean that the text had escaped their notice when they first looked into the column; but he may mean that it summarised the final clarification of the art, which had evaded them in their own studies. The account is typical of the quests for knowledge of the later Hellenistic and Roman periods. The seeker is passionately devoted to the search for the truth—the particular sphere of knowledge which for him sums up all truth and assures his salvation; he feels sure that he cannot attain his goal by his own resources, he needs some revelation from on high; so he manages to conjure up a god or a divine master; he finds in some temple a *stēlē* on which a secret is inscribed. Commonly, esoteric lore is handed on only to a son. How deeply the idea of an urgent need to seek and find had gone into the people of this world we may judge by two sayings attributed to Jesus. "Wherever there are . . . and there is one . . . alone, I am with him. Raise the stone and there you will find me, cleave the wood and there am I." And, "Let not him who seeks . . . cease until he finds, and when he finds he will be astonished. Astonished he will reach the kingdom, and having reached the kingdom he will rest." A deep inner disquiet drove these people on.

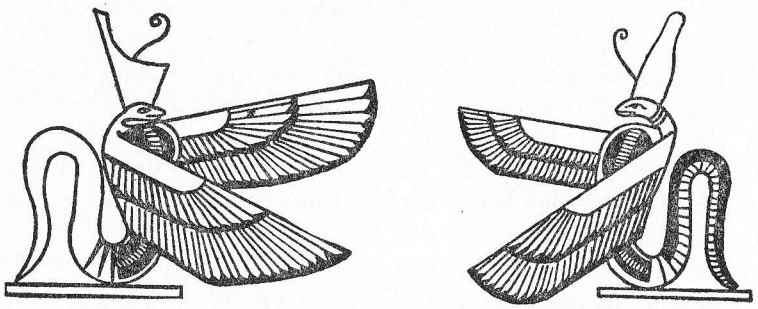
The author of *Poimandres* tells us of the after-effects of such a vision as this of Bolos-Demokritos:

And I began to preach to men the beauty of piety and knowledge: "O people, men born of the earth, you who have given yourselves up to drunkenness, sleep, and ignorance of God, be abstemious, cease to wallow in debauchery, spelled as you are by brutish sleep."

And when they had heard, they came to me with one accord, and I said: "Why, O men born of the earth, have you delivered yourselves up to death when you have the power of sharing in immortality? Turn to repentance, you who taken the way of error and had ignorance for companion. Free yourself from the dark light, take part in immortality, leaving perdition behind you once for all."

. . . And I sowed in them the words of wisdom and they were nourished with the water of ambrosia. The dusk came and the light of the sun had begun quite to disappear. I invited them to give thanks to God. And when they had completed the offering of thanks, each fell asleep on his couch.

As for me, I engraved on myself the benefaction of Poimandres, and after being thus filled full of what I desired, I felt an extreme joy. For in me the sleep of the body had become a sober vigil of the soul, the closing of the eyes a veritable vision, my silence a pregnancy of good, and the utterance of the word a bringing-forth of good things.[33]



12. Cobra-goddesses of Lower and Upper Egypt

Bolos-Demokritos as an alchemist cannot preach in public, but he can and must do his best to spread the glad tidings among those vowed to the sacred art. Bolos says, "I came to Egypt." The prophet of *Poimandres* says, "I have come, filled with the breath of truth." The password for the order of *pneumatikoi* among the followers of the Gnostic Markos was "I have come." Jesus says, "I have come that they might have life."[34] The great alchemic formula which Bolos sets out was almost certainly taken from one of the works to which the names of Ostanes had been attached in the Hellenistic period. Synesios says, "This Ostanes is he who first gave the formula: *a nature &c.*" The commentator called the Christian remarks, "*A nature &c.*, as Demokritos and his master Ostanes have said." We noted how the formula was cited by Nechepso-Petosiris. Bolos uses it as a sort of refrain, repeating it at the end of each of his three recipes for making gold by means of liquids, washes, *zōmoi*. It appears similarly in the silvermaking recipes and it turns up again in the theoretical or doctrinal passages that surround the recipes. In the first section after the goldmaking recipes it takes the following form: "O natures that



produce natures, O natures wholly great that by your changes conquer natures, O natures that beyond nature delight natures." Amid the polemic against the young we find: "In effect they do not know the antipathies of natures, how a single kind destroys ten others; for a single drop of oil can efface a great deal of purple, a little sulphur can burn many kinds." And at the end of the goldmaking part: "What need have we of the coming-together of many kinds since a single nature suffices to conquer the All."[35]

We may assume that the pervasive use of this refrain in *Physika and Mystika* goes back to the original work of Bolos. Indeed it seems plausible that it summed up and expressed the new element he brought into the field of treatises on dyeing and tinting. No doubt he drew on Mazdean and Stoic sources for the idea and its formulation; what was new was his more specific application of it to a series of processes which had previously been treated in a more or less pragmatic way. A late commentator thus sums up the issue of sympathy-antipathy in alchemy and looks back to "Demokritos" for the concise formulation:

And so, by necessity, we must first learn the natures, the genus, the kinds, the affinities, the sympathies and the antipathies, the mixtures and the separations, the loves and hates, the aversions and all analogous things, and by this means arrive at the composition that we want to bring about, as the excellent Demokritos sets it out in short.

In effect, we must not ignore the fact that it is by virtue of a natural sympathy that the magnet draws the iron to itself, by virtue of a natural antipathy that garlic, rubbed on the magnet, takes away its natural property. In the same way again, if there is a mixture made by pouring water into wine and a separation made by oil poured into water, we must not neglect the things that come together by reason of a natural sympathy and we must at the same time take note of those that oppose one another through antipathy.

Thus it is by reason of a natural sympathy and a substantial affinity that certain liquids mix together and amicably unite their substances, delight one another, and maintain themselves in this state of coexistence, which is proper to them, while others oppose one another and separate out by reason of an antipathy, a hate, an aversion.[36]

The tale of Demokritos and the ghost of Ostanes travelled far and long. In the *Book of Krates*, a Greek text that survives in an Arab version, an angel appears to the narrator:

"Have I not told you," he replied to me, "that the master of Demokritos had not taught him the combination of matters and had left

him in a painful doubt about it. So Demokritos had to study books, make researches, multiply experiences and informations, and undergo serious mortifications, before arriving at the right way. According to what he tells, he found nothing so difficult as the obtaining of the intimate mixture needed for realising the combination of matters . . ."[37]

Another Arab text displaces Demokritos:

The Sage [here Balinos: Apollonios of Tyana] said: "Nature grasps Nature, Nature conquers Nature, and Nature rejoices in Nature." Consider the wisdom of this Sage, how he gathered in a few words so much knowledge; for he means by this three marriages between Males and Females: . . .[38]

We noted above the legendary links of Demokritos with Dardanos and Apollobeches (Apollobex). Dardanos is not the Greek hero, who among other things was a mythical ancestor of the Trojans.[39] He represents Phoenikian, anti-Jewish magic, and was the rival of King Solomon.[40]

And Solomon's wisdom excelled the wisdom of all the children of the east country, and all the wisdom of Egypt. For he was wiser than all men; than Ethan the Ezrahite, and Heman, and Chalcol, and Darda, the sons of Mahol; and his fame was in all nations round about. (1 Kings iv 31.)

Here again we meet the rivalry of Egyptians and Jews in matters of wisdom and magic. Josephos adds to *Kings*:

He spoke a parable upon every sort of tree, from the hyssop to the cedar; and in like manner about beasts, about all sorts of living creatures, on the earth, in the seas, or in the air; for he was not unacquainted with any of their natures, nor omitted inquiries about them, but described them all like a philosopher and demonstrated his exquisite knowledge of their several properties. God also enabled him to learn that skill which expels demons, a science useful and healthgiving to men. He composed such incantations also as alleviate distempers. And he left behind him the manner of using exorcisms to drive away demons and prevent them from returning; and his way of cure is of great force to this day. I've seen a man of my country, Eleazar, free people that were possessed, in the presence of Vespasian, his sons, his captains and a whole host of soldiers.

Eleazar put to the man's nostrils a ring with a root in it, and drew the demon out; then bade the demon overturn a basin of water set some distance away, to prove that he had left the man's body.



We have a lovecharm, *The Sword of Dardanos*, of which we shall later have more to say. Columella speaks of Dardanos as if he dealt in the sort of spells that we have seen attached to Bolos-Demokritos; he is dealing with ways of banishing caterpillars:

> But if no medicine can the pest repel,
> Let the Dardanian Arts be called to quell.[41]

A girl at her first menstruation is led with bare feet and breasts, and with hair loose, thrice round the beds and garden-hedge. "To earth at once in twisted shapes the caterpillars roll." Apuleius, denying the charge of magical practices, declares, "If you can prove that I thus got the least bit of gain, then may I be held a Phrynondas [? Carmendas], a Damigeron, a Moses, an Iannes, an Apollonios, or even Dardanos himself, or anyone else who, since the days of Zoroaster and Ostanes, has been famous among magicians."

The themes of books-in-a-tomb became so attached to Demokritos that we find in a Latin MS of the 9th century (from St Gall): "he wrote [a work] on ivory tablets and ordered it to be put in his own tomb."[42] As for Apollobex, he seems the same as the Pibechios who appears in alchemical MSS, who writes to Osron asking for the Divine Books of Ostanes, or who deals with yellowing substances without whitening.[43]

Before we end this chapter we shall glance at some more tales about sacred lore found on *stēlai* or pillars. Such tales help us to enter into the minds of the men of these times, with their ceaseless quest for revelation and for lost secrets. Manethōs speaks of the mysterious *stēlai* of all-knowing Hermes. Iamblichos says: "If you propose some difficulty in philosophy, we'll settle it according to the ancient *stēlai* of Hermes that Plato and Pythagoras read in entirety and from which they constituted their philosophy." Olympiodoros says the secrets of the mystic art are inscribed on the obelisks in hieroglyphs.[44] Josephos tells us of Seth's children:

They were the inventors of that peculiar sort of wisdom that is concerned with the heavenly bodies and their order. And that their inventions might not be lost before they were enough known, on Adam's prediction that the world was to be destroyed at one time by the force of fire, and at another time by the violence and mass of water, they made two pillars: one of brick, the other of stone. They inscribed their discoveries on them both so that if the brick pillar was destroyed by the flood, the stone pillar might remain . . .[45]

Josephos said the pillars were still to be seen in the land of Siriad. Till the end of the Byzantine period, writers repeated that Seth, inspired by an angel, had taught men astronomy and even astrology.[46] Tales of other sages writing their lore on pillars were also told.[47] Zoroaster, called the founder of star-science at Babylon, was said to have set up 14 pillars, 7 of bronze, 7 of bricks, on which he inscribed the liberal arts, "so as to preserve them for the use of posterity in the case of either flood." Seth and Zoroaster were identified; and it was due to a *Scripture in Seth's Name* that the author of the *Opus Imperfectum in Matthaeum* drew his tale of the apparition to the Mages of the star that informed them of the Messiah's birth.[48]

We noted above that the Arabs told of Hermes building the pyramids. They had received from the Sabians of Harran the works of Hermes as the greatest old Greek philosopher, and they accepted the view that the pyramids were stacks of vast treasures, with the pictures and hieroglyphs as instructions in secret knowledge, alchemical and astrological. Edrisi (al-Idris, 1099–1166) who composed his *Geography* at the Norman court in Sicily in 1154, records:

> In Achmim [Panopolis on eastern bank of Nile] one sees a building called al-Berba, which was built by the glorious Hermes before the Flood. He foresaw, by virtue of his arts, that the world would be destroyed by catastrophe, though he did not know whether by fire or water. And so he first raised walls of earthy matter, free from combustible parts, and covered them with pictures and scientific emblems in order that in the event of the world being consumed by fire they would remain and even gain in solidity and those coming after could read the inscriptions.
>
> Then, however, he caused a building of the hardest stone to be erected, thus providing for the preservation of all sciences useful to man, and said, "In case the catastrophe by water occurs, the buildings of earth will fall, but these will remain and preserve science from destruction."
>
> When the Flood occurred, everything happened as Hermes predicted. Buildings of the same kind are found also in Esna and Dendera, but those in Achmim are the most solid and remarkable for the number of their pictures, which represent not only the stars but also the different arts, and further the number of inscriptions is very great.[49]

*In Spangles of Gold* by Ibn Arfa' Ra (died 1197) Hermes is called "a generic notion". The real name is Ahmun, that is Henoch;



and Henoch was the same as Adam's son Idris. His home was China; but coming through India to Ceylon, he found the Cave of Hermes with vast treasures, a portrait of his father Adam, and the loveliest jewels, including one especially large and costly (presumably the *Tabula Smaragdina*); he was an alchemist. Psellos links Plato's voyage to Egypt with the legend of mysterious revelations and tablets in the Pyramids. Arab writings on alchemism are full of hidden books: *The Treasure of Alexander the Great*, the *Book of the Discovery of the Hidden Secret of the Kaf*, the *Book of Hermes on the Causes of Beings*. There are also the Arab hermetic works, such as the *Book of Krates* (based on a Greek original) where we meet not only the hidden book and its discovery, but also the ravishing-up-to-heaven and the celestial vision, a book delivered by some divine person (here Hermes Trismegistos), the dictated book, the heavenly temple with open door, the fight with a dragon. Further, for books in tombs, we have the tale told by Ploutarch.[50] Numa, the legendary king of Rome, whom he connects in various ways with Pythagoras, had his sacred books at death put in a stone coffin to be buried next to that with his body. Numa said that he had fully taught his doctrines to the priests, and that he did not want such holy precepts to circulate in an irreverent way. Some four hundred years later a great rainstorm washed the earth from the coffins on the Janiculum; one was quite empty, the other had 12 books of holy writ, 12 of Greek philosophy. The praetor read the books and reported to the Senate they were not fit to be made known to the public. So they were all burned in the Comitium.[51]

The Christians took over the idea of books of revelation. We find them in visionary form in *The Shepherd of St Hermes*. In the second Vision "I saw over against me the Old Woman whom I had seen the last year, walking and reading in a certain Book. And she said unto me: Can'st thou tell these things to the Elect of God? I answer'd and said unto her, I cannot retain so many things in my Memory, but give me the Book, and I will write them down." A fragmentary Coptic tale, near the 11th century, brings in Solomon and the Queen of Sheba. The Queen says, "In my country there is a column, O Shelemo, Master of Kings: if you send to seek it and if you can have it transported here, it will be useful for your palace." He calls up all his demons and asks how long they will take to fetch it.

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The first demon replied, "I'll bring it this evening."

The second said, "I'll bring it in an hour."

The third, who had no more than half [a body], said to Shelemo, "I'll bring the column [between] two respirations of your breath."

Indeed the word was still in the mouth of Shelemo when the demon who had only a half was already on the way back. The column was on his wing, it was turning this way and that like . . . All early knowledge is written on this column. There is inscribed [the course] of the sun and [the moon]. . . .[52]

The account given by Pausanias of a rite at Pheneos in Arkadia perhaps gives us a clue to some of the ultimate origins of these tales. There were "two great stones fitted to each other". Yearly, "when they are celebrating the Greater Mysteries, they open these stones. Taking out certain writings, which bear on the Mysteries, they read them out in the hearing of the initiates, then put them back in their place that same night." The books taken from a secret place in a shrine are read out to initiates in certain rites; then they are put back into a place that represents the spiritworld or underworld. In the rite at Pheneos a masked priest "beat at the Underground Folk with rods"—presumably to keep them at bay during the time when the stones were opened up and the entry-exit of the spiritworld was dangerously open.[53]

# 6

# More on Bolos

QUOTATIONS from Bolos-Demokritos are scattered through the other alchemic writings. We gather that he was responsible for the idea of the four basic metals. In *Thirtyfive Chapters from Zosimos to Eusebios* we are told

> Demokritos has named as substances the four bodies: that is, copper, iron, tin, lead. . . . All these substances are employed in the Two Tinctures [of gold and silver]. All the substances have been recognised by the Egyptians as produced by lead alone. For it's from lead that the other three bodies come.[1]

The *Physika* calls this lead "our lead". It was doubtless antimony, the lead which is richest in water and so the most fusible. For this reason the alchemists took it to a sort of primary matter. And so, to turn it into other metals, their first problem was to change its colour.[2]

Colour from far back had been one of the simplest ways in which craftsmen might identify ores, metals, stones. It also had always had a strong magical value, and properties were ascribed to stones largely on account of their colours. Similarly, certain colours were prescribed for magical figures. Thus, the Ophites, says Origen, used coloured circles in their mantic practices. In Egyptian spells we find instructions like the following:

> Say on seven images of Jackals drawn on a piece of fine linen in colour . . . and again once in colour, and wrap the man's body in it . . .
>
> [Book of Apepi] Say [this formula] on Apepi made out of wax, on which has been written in green colour his name that is written also on a new sheet of papyrus. . . .[3]

For the alchemists, from the outset, colour had a practical significance and was taken at the same time to reveal the inner nature of the metal and its changes. Colour was regarded as a form

of activity and so as spirit or *pneuma*, which could be removed from one substance and infused into another. "A tingeing *pneuma* gives its colour to metals." The colour of plants was their *pneuma*.[4] Generally the steps of transformation began with an earth or some identifiable solid or an alloy or base metal like lead, the tetrasomy (lead, tin, copper, iron), or "metal of magnesia". What the worker sought was to impose on these bodies the qualities of liquidity (water) or fusibility and brilliancy (air, fire). The metal or material had often first to be broken down into a "body": a degeneration that might be brought about by fusing it with sulphur. This step was called blackening, *melanōsis*. Then came whitening, *leukōsis*: often a fusion with the "ferment" or "seed of silver", in which ingredients like arsenic of mercury were used. Here was the counterpart of making or faking silver and its alloys. The third step was the production of a violet or purple colour, *iōsis*. The violet ferment changed the gold through and through into an *ios* of gold, which was the permanent tincture, and, if cast on common gold, produced more.

This interpretation of *iōsis* (refining) has been challenged. One scholar has suggested that the *iōsis* was a formation or purple bronze like the Japanese *shaku-do*; but such a formation does not fit into the scheme of changes and there is no evidence for it. Another suggestion is that *iosis* was the final removal of any *ios*: rust or tarnish on the surface of the metal. However, it seems sure that *iōsis* was a third colour-change expressing the culmination of the alchemic process, so that *ios* here means violet and not rust.

Indeed we see in the process a very ancient scheme of mystery-changes. The *Souda*, identifying Io and Isis, says that when Zeus carried Io off from Argos he changed her into a cow through fear of Hera; and this cow was by turns, white, black, violet. A linked triad of colours appears in the Byzantine romance *Dosikles and Rhodanthe* (12th century), where the life-giving herb is white at the root, rosy in the flower, purplish in the stalk. We are here back at the theme of the life-giving herb which we noted above in connection with the myths of Tylon and Glaukos. In the version given by Hyginus of the Glaukos-myth we meet a riddle, associated with the lad's return to life: What changes from white to red, and from red to black? The answer is the Mulberry. The Glaukos-myth has clear signs throughout of being derived from initiation-ritual; and riddles were often used



in such ordeals, in which the secret lore of the tribe or group was handed on to the initiate. (There also seems colour-symbolism in Pindar's account of the birth of the prophet Iamos in a dark blue or kyanean thicket where the mother puts down her crimson zone and silver pitcher, and the baby is steeped by the violets, *ia*, in gold and deep-purple light. Hence Iamos, it is supposed, gets his name.) There can be no doubt that there was an ancient link of the three colours with a herb of resurrection.[5] Violets, we may further note, were taken as symbols of the rebirth of the young man god Attis and of the rape-blood of Persephone; they thus link with the blood-plants like the pomegranate. In view of the close connection between the magics of plant and metal in the lores we have been considering, we may assume that the colour-triad of the flower of death-rebirth was sought for in the bodies, metals, of transformation—so that when such a triad of changes were noted in the bodies, it was felt to be significant of a change from death to life inside them. Indeed, we know the alchemists used those very terms. Thus, Stephanos, speaking of the *horos* (standard or definition) of Philosophy, Alchemy, calls it "the dissolution of body and the separation of soul from body". *The Book of Krates* says, "Know that copper, just like a man, has a spirit and a body."[6]

If we see the process as involving a further change, *xanthōsis* or yellowing, between the white and the violet, so that it is "quadripartite" (as the Anonymous states), the principle is not altered. Zosimos addressing Theodoros says that "the yellow becomes blood-coloured and stable and finally like dried saffron". Ibn Umail, writing in the 10th century and citing the Egyptian tradition, tells us:

> Marqunas said to Sanqaja, "O Sanqaja, similar is the habit of that Water. Consequently the men of the Egyptian Temples gave it superiority over all things and made it the Head of the world. The World is *Maghnisiya*. Hermes [Hurmus] called it by that name, for he said: It is the Microcosm, and it is alive, not dying till the Day of Resurrection, as long as the world will last—it revives all dead and it manifests the hidden and concealed colours and takes away the external colours."
>
> Sanquaja said, "How does this take place, O King?"
>
> Marqunas replied, "In it is a wonder. When you pour it out on those three, the mixed things, and leave it [awhile], the White will help the Yellow and the Red, and [in turn] it will whiten them and convert them to the whiteness of pure Silver. Then the Yellow will help the

White and the Red, and convert them into Yellow, and make them the colour of Gold. The Red will help the White and the Yellow, and will redden them and convert them into the Redness of the Serpent of the Sea. When you see them in this state, pour away that Water, because, if it remains in them, it will blacken them after the reddening. If you let it remain, then truly you will have committed a mistake in the operation and spoiled everything which you have correctly prepared. And you will die from the pain of error, poverty, and grief at [losing] wealth. I have explained all this in my book, *Key of the Greater Wisdom*, by mentioning the Water that comes out of a women before giving birth to a child. This Water woman name the Guide as it comes out before the child and the child is then perfect."

Sanqaja asked the King Marqunas about the knowledge of the Stone and said, "Does everyone know this?"

Marqunas replied, "Yes, there is no one who does not know this, and everyone has advantages in it not found in anything else. But no one knows the advantages that you desire, save the men of the Egyptian Temples."[7]

That is, the alchemists working in the secret tradition of Egypt.

In the *Letter of Demokritos to Leukippos* the colour-changes are compared with those of the chameleon.

Take only two parts of treated copper, of arsenic and of sandarach [realgar], a part of each, alum in a half part, two parts of saffron paste, and pound for 21 days, or 14, or 7. After the reduction to powder, add water, and when you've let it filter, you'll see, in the course of the levigation, differing colours like those of the chameleon. When there are no more changes in many appearances, know that you have succeeded in the reduction.[8]

The Bolos-Demokritos of Plinius was very interested in the chameleon itself. The account begins:

Democritus relates that its head and throat, burnt on logs of oak, cause storms of rain and thunder, as does the liver if burnt in tiles. The rest of his remarks smack of sorcery; and though I think them false, I'll omit them all save where a point must be refuted by mockery, e.g., the right eye, plucked from the living creature and added to goatmilk, removes white ulcers on the eyes; the tongue, worn as an amulet, the perils of childbirth. The same eye, in the house, favours childbirth; if brought right in, very dangerous. The tongue, taken from the living animal, controls the results of courtcases; the heart, tied on with black wool of the first shearing, overcomes quartan fevers.

The right front foot, tied as an amulet to the left arm by a hyena-



skin, is a strong protection against robbery and night-terrors; and the right ear [or jaw] against fears and panics. The left foot however is roasted in a furnace with the plant also called chameleon; an unguent is added; and the lozenges thus made are stored away in a wooden vessel, and, if we may believe it, make the owner invisible to others. The right shoulder has power to overcome adversaries and public enemies, especially if a person throws away sinews of the same animal and treads on them. But as to the left shoulder, I'm ashamed to repeat the grotesque magic that Democritus assigns to it: how any dreams you like may be sent to any person you like, and how these dreams are dispelled by the right foot, just as the torpor caused by the right foot is dispelled by the left flank . . .[9]

And so on. The liver acts against lovecharms; the juice of *helenium* (elecampane), drunk in the skin, cures melancholy; the tail halts or divides rushing rivers, and lulls snakes to sleep. Aulus Gellius, following Plinius, also wrote scathingly of Democritos for having composed a book *On the Power and Nature of the Chameleon*. "The hawk, swiftest of all birds, if it chances to fly over a chameleon crawling on the ground, is dragged down and falls through some force to the ground." He adds, "Many fictions of this kind seem to have been attached to the name of Demokritus by ignorant men sheltering under his reputation and authority."[10]

13. Relief of Campaspe riding Aristotle, cathedral of Lyon, late 13th or early 14th century A.D.; and Psyche ridden by Aphrodite and burned by fire on the Sword-of-Damokles gem

This interest in the chameleon makes all the more likely that the *Letter to Leukippos* is by Bolos or at least draws strongly on his writings. The process described in the *Letter* brings out another philosophic principle that we may attribute to him: that of the unity of matter in all its diverse forms and qualitative changes. The stages at either end of the scale, and all the intermediate stages, are equally upheld by a unitary stream or substratum, the *hypokeimenon*. It has been pointed out that this position is not that of Aristotle or Plato, but rather that of the Presokratics, who had also a unitary notion of matter as something with a predetermined nature or form underlying its accidental or incidental changes. Plato's *chōra* (space), and even more Aristotle's *prōtē hylē* (primary matter), had only a sort of potential existence and could not themselves be defined as being here or there, in a specific place or with a specific form.[11] But that does not mean any regressive step on the part of the alchemists. They hold fast to the idea of a continual movement from the potential to the actual; but add the Stoic concept of an endless series of tensional forces controlling the movement (both from local or cosmic viewpoints). Thus they pick up the presokratic unity at a new level, much subtler and more complex, and they see it in terms of a hierarchical system of varying degrees of organisation, in which changes of quality appear. (Not, indeed, that we need to bring in the Presokratics at all; Diogenes Laertes tells us of the Egyptians: "They say that matter was the first principle, next the four elements were derived from matter, and thus living things of every species were produced.")

The change in quality, which was also a change in inner organisation, was linked or identified with the colour-changes. Lead, a primary common metal, had to be broken up, changed, driven up the scale, towards silver or gold; it had to change its colour. So fire was invoked; and under its action the lead was reduced to a fluid state. The fluidity thus brought about was what constituted the primary level, in which new potentialities were actively present. It represented, in one sense, the amorphous state of Platonic Space or Aristotelean Primary Matter. Also the liquefaction of lead involved its blackening. So the blackness of the liquid condition above all expressed the attainment of a primary level, a state of chaos. Having produced chaos, the alchemist was in a position to act the role of demiurge and drive matter up its hierarchical ladder, with gold as the highest



step. To bring about this upward-movement the principle of sympathy or attraction was invoked. Somehow the Primary Black had to be transformed into White or Yellow, which expressed the nobler metals. This could be done, it was believed, if one could find a metal which had certain affinities with both the lower and the higher substances, which sympathised with both of them and which exerted its attractive power in both directions (downwards and upwards). By using the right kind of metal, in the right kind of proportions, one could swing the balance towards the upper levels and thus transform the material into the higher.

The principle of this operation was expressed in the famous triadic formula of Ostanes which Bolos-Demokritos discovered. The two materials, that of primary matter or liquid blackness and that of the alloying and transforming addition, must have something in common, some element of harmony. That is, they delighted in one another. But if that were all, a state of equilibrium was created and nothing happened; the first level was not transcended. So one nature must conquer the other. The conquering act was the moment of transformation, when the equilibrium was broken and a new relationship established. The new fused substance existed at a higher level and involved the creation of a new quality, which revealed itself in the colour-change. But that was not enough. The new state must be stabilised, so that it might provide the basis for yet another upward-movement. Hence the third section of the formula: one nature must dominate another. The three stages of the alchemic act might then be defined: mixture on the original level, introduction of a dynamic factor which changes the original relations and creates a new qualitative level, then stabilisation of this new level. In an Arab text we saw the process described as three marriages, the two substances acting on one another being called male and female.

We may take some simple examples of the process, which involve materials we have already discussed in other relations: rhubarb, saffron, and magnet. Coat silverleaf with a mixture of Pontic rhubarb and Aminaion wine (Italian), then warm gently till there is complete penetration. Finally melt the leaf and you will find gold. "If the rhubarb is old, add an equal quantity of *elydrion* (*chelidonion*) that you have had macerated as is usual; for *elydrion* has affinity with rhubarb."[12] Both rhubarb and *chelidonion* provided a yellow dye-stuff. Here then we see plant-magic used

to change silver into gold. In another recipe which also deals with the coating of a material, Kilikian saffron is used: "It has the same action as mercury, just as cassia has the same action as cinnamon." In a silvermaking recipe that deals with projection on to copper or iron: "you will soften the iron by adding magnesia or an equal quantity of sulphur and a small quantity of magnetic stone; for the magnet has affinity with iron."[13]

The idea of the fusion as a mating or marrying of substances with a magical affinity was already present. For silvermaking: "Take 4 ounces of whitish copper, I mean orichalk, melt it, and throw in little by little 1 ounce of tin previously purified, shaking it from below with your hand so the substances may be married together."[14] The question of affinities is stressed by Zosimos addressing Eusebios:

> Take white sulphur, whiten by dilution in the sun with urine or alum or salt-brine. Native sulphur is much the whitest. Dilute it with sandarach [resin] or a heifer's milk, for 6 days, until the preparation resembles marble. If it succeeds, it will be a great mystery,; for it whitens copper, softens iron, makes tin not crackle [hardens], makes lead non-fusible, metallic substances unbreakable, and fixes tinctures. For sulphur mixed with sulphur makes metallic tinctures sulphurous, since sulphur and metals have a great affinity with one another.[15]

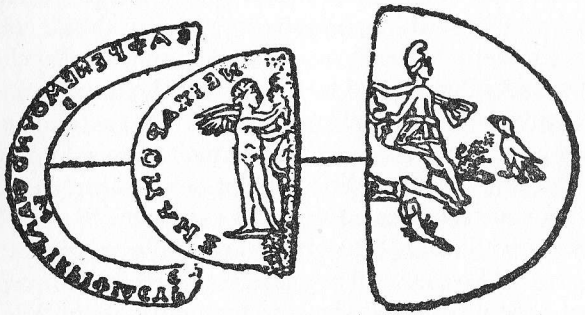
In theory it was the qualities of the bodies, not the bodies themselves, that did the interpenetration and fusing. "Only the qualities bring an action about. For a body, accord to Aristotle, cannot penetrate through another body. Only qualities are able to penetrate one another together."[16] This formulation cannot mean that the qualities existed as things-in-themselves, apart from the bodies; it asserts that the key-aspect of the moment of change lies in the action of qualities in the bodies on one another. The change does not come about through the mechanical addition or mixture of the quantities in the bodies, but in an unseizable moment of chemical qualitative change. In that moment, the qualitative change produces a new sort of unity, which cannot be reduced to a merely additive mixture.

We saw above the link of Demokritos in legend with Dardanos, whose tomb he was said to have rifled for magical secrets. It would be worth while citing here a spell and an engraved gem, which help us to illuminate the question of Dardanian magic and to show how it links on the one hand with initiation-tests or



ordeals and on the other hand with alchemic process. The text runs:

> Sword of Dardanos. Recipe called Sword, without its like for efficiency. For it bends and drives the soul at once, wherever you wish, as soon as you recite the formula, while saying, "I bend so-and-so's soul."
>
> Take a magnetic stone, the breathing stone, design on it Aphrodite riding Psyche as on horseback, holding her with the left hand and doing up the locks of her hair. Above her head engrave *achmagerarpepsei.* Below Aphrodite and Psyche, Eros, standing upright on a globe; he holds a lighted torch with which he burns Psyche. Below Eros these names: *achapa Adōnaie basma charakō Iakōb Iaō ē; pharpharei.*
>
> On the other side of the stone, Eros and Psyche embracing, and under the feet of Eros *sssssss*, below Psyche *ēēēēēēē*.[17]



14. Gem of Mithras slaying the Bull, with Eros and Psyche on the reverse (broken)

There follows the indication of a prayer to the Principle of All Birth, which the magician is to utter after putting the engraved and consecrated gem under his tongue. A Syrian gem shows exactly the scene here described. Aphrodite rides on Psyche, who struggles along naked on all fours while Eros burns her from below. Aphrodite is calmly doing up her hair. The stone is a black jasper, evidently meant to correspond with the breathing magnetic stone of the papyrus. The inscriptions reproduce with variants those that the charm laid down: *Ach aag egar gerph epsi* and . . . *chladō naiebacmlcha* . . . *ōia kōbisakō*. On the smaller face of the stone the two lovers kiss, but the inscription runs *iasim ē ma*, which may be taken as *isasim*[*on*] *ēma*, "curable [love-]wound". The series of Ss and long Es have been omitted because they represent, not magical words, but the eight breaths taken before

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uttering the prayer. (After an invocation for spell-loosing we meet a direction for eight breaths.)[18] For our spell the eight breaths seem a part of the consecration of the gem, which comes between the engraving and the praying. As the stone is thought to breathe, they may be meant to bring about an active harmony between stone and magician. On the back of the gem the artist has not attempted a spell, but merely adds a witty comment. Similarly on a stone from Arados there has been cut, "Happy the [meeting or embraces] of lovers."[19] This comment accompanies the image of Aphrodite seated left in the backed chair, naked and leaning on a sceptre (?); in front of her, below, Eros and Psyche (?) embracing.[20] On other Syrian magic gems we find Aphrodite standing naked at her toilet or riding a lion with her hands in her falling tresses, her drape rolled round her right leg.[21] We also find on other gems Eros riding Psyche in a racing-course where the goals are Psyche's butterfly and Eros' weapons; Psyche being burned by Eros; Psyche tied to a tree while he burns her; Psyche tied to a griffin-topped pillar; Eros burning a small creature, apparently a butterfly. On the gem that shows Psyche being burnt by the tree, the inscription in front of her runs, "As you me," that is, "As you have treated me, so I treat you."[22]

In the Sword-of-Dardanos charm and the gem representing it we find the child's-game of *ephedrismos* turned into an expression of triumph; the victim is ridden and tortured—burnt. We at once think of the fable of Psyche and Eros in Apuleius' *Metamorphoses*, where Psyche after her fall from grace is subjected to tests or ordeals by Aphrodite. Not that the charm or gem are likely to be derived from Apuleius; rather we must think of both art-works and story as deriving from folktales on the theme, in which no doubt there were many variants. But for us here what matters is the connection of Dardanos and his magics with Demokritos (whether or not Bolos-Demokritos), the use of the magnet (the stone with *pneuma*) and sympathetic forces, and the way in which Psyche is burned into her new birth or redemption. The myth represents the three stages of the alchemic process: the primary stage of ignorance or unconsciousness, with the fall of Psyche-Eve-Pandora through curiosity; the purgation or moment of change through pain (by fire); the redemption in union re-established on a new level, of secure knowledge. Love with his torch here has become identified with the Sun, especially in the Egyptianised form of Horos; and it is his transforming flames



that both torture and release.[23] All this does not signify any direct relation of the myth or the charms with alchemy, but it helps to bring out the close inter-connections of so many of the elements of culture in this period.

Before we pass on, we may note that Psyche developed an important relation to fire as the active ensouling principle or force. In the Chaldean Oracles she is identified with fire itself. "Psyche is a Fire, luminous with the Father's Power; she remains immortal and Mistress of Life is she." Eros in turn is first issue of the Paternal Intellect and introduces his "binding fire" into the Ideas of that Intellect. No myth here connects them; but we can see how the binding fire might be used in an ordeal test on the ensouling principle if a tale of the initiation-myth type were told of Eros and Psyche.

Among the statements attributed to Demokritos is that by alchemy "you will conquer poverty, that incurable malady". Synesios makes this attribution; but the phrase is handed over to Zosimos by *The Book of Sophe*, and it appears again in the treatise of Agathodaimon: alchemy "drives away poverty in this world and will bring great reward in the next."[24] Alchemy thus makes poverty a curable malady as the gem made love a curable wound. From the brevity of the aphorism it is not clear if the alchemist looks only to his own escape from poverty or to a general elimination of hardships. The more personal interpretation no doubt dominated in later phases; but at the outset alchemy may well have shared in the deepening revolt against the social system which is expressed in the many prophecies and apocalypses. What more likely to be a key-force in inaugurating the age of gold than the science of transmutation into gold? In any event the aphorism about poverty seems to belong to the earlier strata of alchemic thought.

In an Arabic treatise that appears to hold genuine Greek material we find Zosimos declaring that the ten processes, to which the sage Demokritos gave different names, are truly only one process and result in a single compound. Demokritos, he says, declared that nothing was more difficult than combination, which brought the Natures into a single Mercury. In another Cairo MS we read: "They have called this secret the Egg; but all of them mean Mercury." And later, "The Ten that overcame the One are the Colours that proceed from the Tincture of the Egg. This is not found save in the Sea of Egypt, and it is its

Water." These statements are in the key of what we know of Bolos-Demokritos.

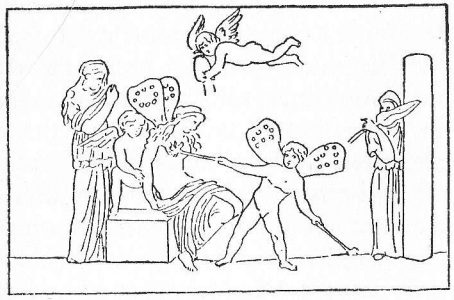
Oddly, the conflict of Bolos-Demokritos with the young school seems to carry on in some tradition that appears in the medieval Latin *Crowd of Philosophers*, where near the start Lucas says that all things are from the Four Natures. Demokritus his disciple agrees and is rebuked by Arisleus. Lucas remarks, "Though Demokritos received from me the science of natural things, that knowledge was derived from the philosophers of the Indies and from the Babylonians. I think he surpasses those of his own age in learning." The Crowd answer, "When he attains to that age, he will give no small satisfaction, but being in his youth he should keep silence." The tables seem to be turned on him as a rash youth. In the *Geponika* the teachings of Demokritos are opposed to those of Zoroaster.

We may now glance at the papyri of Stockholm and Leyden that have often been linked with the *Physika*. The methods of Bolos do not seem essentially Egyptian. They derive rather from Syrian, Jewish, Babylonian, Iranian sources. Bodies are changed by embedding them in chemicals which penetrate them right through in a prolonged heating of the mass; the Egyptian method on the contrary was by projection (with powder) or sublimation (conversion to vapour by heat and back again); chemicals were projected into the body to be changed, which might first be conditioned by roasting. The Egyptians had had a long tradition of dyeing of materials, as also had the Tyrians and others. They had also long adapted dyeing techniques to the tinting or tingeing of metals; they thus devised processes of dipping into mordanting baths, alloying, and treating with Royal Cement and Sulphur Water. This water was a reagent, a solution of sulphuretted hydrogen, also called Holy Water, perhaps on account of its horrible smell. It was made by heating sulphur with lime, then pouring water in. "On opening the cover," Zosimos warned, "do not put your nose too close to the mouth of the jar."

Bolos used the data gathered by craftsmen, who seem to have compiled textbooks on alloying, dyeing, imitating precious metals and gems. It has often been suggested that papyrus X of Leyden and the Stockholm papyrus are such textbooks in a corrupted or mutilated form; but it has been shown that their recipes give no



practical results. We have however a Koptic MS, dated 7th–8th centuries, which reveals a system rather like that of the Stockholm papyrus; and from it reconstructions have been made of the original dyeing recipes of that papyrus as well as of that of Leyden. The two papyri (which, being found in a magician's tomb at Thebes, are actual examples of tomb-derived secrets) are certainly of Egyptian origin. For example, silver, *argyros*, is described in a term, *asemos*, characteristic of Egypt. (*Asem* was properly *elektron*, a natural alloy of gold and silver, from which, by separation, either gold or silver could be drawn; this fact may have stimulated the idea that by such methods a man could change any metal into another.)[25] But the papyri are no longer mere craft-manuals on the colouring of metals and textiles. They may go back to the *Baphika* of Anaxilaos, written in Egypt where he had been banished by Augustus for practising magic.[26] If so, he was carrying on the work of Bolos, who had studied the craft-manuals in his quest for clues as to the changes in matter; he and his school drew on the books of the craft-dyers of textiles and their terminology so as to find ways of describing the alchemic changes of colour in metals and stones.[27] Terms used to define the degreasing, mordanting (*stypsis*), and dyeing (*baphe*) of cloth, were used to define changes of form in metals. Transformation into silver became *baphe*, that into gold *katabaphe*, superdyeing. Other terms, such as varnishing, bronzing, waxing were taken over from old recipes for metal-tinting. Using extracts from the craft-handbooks, the alchemists carried out their experiments, using or adapting recipes that seemed to effect or promise transformations. To exclude the uninitiated, they often only gave part of the recipe; and this sort of omission occurs in the Leyden



15. Pompeian painting of the torture of Psyche

and Stockholm papyri. Alchemists admitted, "There is all that is needed for gold and silver; nothing has been forgotten, nothing lacks, except the vapour and evaporation of water. I have deliberately left them out, as I clearly set them out in my other writings."[28] New terms and cryptograms were also brought in to denote the chemicals of the dyers and metallurgists. The aim had completely changed. It was now a philosophical inquiry into the nature of material changes. Colour-changes (that is, qualitative effects) were the main criteria, but there were a few efforts to control the situation by means of weights.

Because of the attempt to make an esoteric doctrine or philosophy out the data of craft-recipes and the like, the creed of secrecy grew up from the start, together with the use of symbolic words: wolf's milk, seafoam, cat's eye, dragon's blood. Here there was again affinity with magical procedures. Thus in the Leyden magical papyrus V we find *Explanations*, *Hermēneumata*, dealing with the symbolic names of certain plants and stones, names engraved on divine images to prevent the profane from getting control of the practices.[29]

Now that we have had a glance at what can be made of the shadowy but crucial figure of Bolos, let us look back at the historical Demokritos and see if we are at all clearer of the relationship. Both Plinius and Aulus Gellius were very puzzled at what seemed a contrast between the rigorously materialist scientist and the champion of sympathetic magic in its most fantastic forms. Gellius says the tales "are unworthy of the name of Democritus". Plinius, speaking of the twin palmbranch, remarks, "Would that Democritus had been touched with such a branch, since he assures us that by it wild prattling is restrained. It is clear that a man, in other respects of sound judgment and of great service to humanity, was brought low through his zeal to aid mankind."[30] Petronius, with his keen critical mind, pays a high tribute to Demokritos, turning to him for an example of entire scientific dedication in contrast with the prevailing degeneration under the Empire. "Love of money started off this reversal [*tropica*]. In former times virtue was still loved for its own sake, the noble arts flourished, and there were the sharpest struggles among mankind to prevent anything being discovered that might benefit posterity. So Democritus extracted the juice of every plant on earth, and spent his whole life in experiments to



discover the virtues of stones and twigs."[31] (He uses an astronomical metaphor for the turn-back in human affairs; the reference is to Capricorn, where the sun turns back.) Note that it is to the work on plants and stone, not to atomist theory, that he looks as the characteristic scientific activity of Demokritos.

It is impossible to believe that the whole tradition of Demokritos' studies had become perverted by the 1st century A.D. and that no Hellenistic scholar noted how a lot of alien treatises were being foisted on to the philosopher. We must ask again if the treatises on plants and on the chameleon were the work of the 5th or the 2nd century B.C.? That the historical Demokritos travelled extensively and really did know the work of the mages and *magousaioi*, we may accept. More than any other classical Greek thinker he seems to have been respectfully interested in the ideas and practices of the *barbaroi*. We have seen that the strange tales of his tomb-haunting seem certainly to have their origin in the world of fact and to be connected with his theory of *eidola*. That theory presupposes the idea of sympathetic and antipathetic forces; for otherwise it would be impossible to explain why the *eidola*, swarming furiously everywhere around us, impact on only a person here or there. Demokritos carried out his experiments, it seems, precisely to find out what conditions aided the impact or deadened it. We have no account from him of how the *eidola* were constructed, but we may assume that he saw all spiritual activity as the construction and emission of bodies of finer atomic composition than that of palpable bodies. Even inorganic bodies seem to have been considered to own the power of emitting *eidola*, and so the forms of energy were seen at work in all bodies whatever. How the *eidola* emitted by a stone were differentiated from those emitted by a man we do not know, but the theory would seem to assume both a unity of energy at all its levels, plus a differentiation. If so, it was in accord with the alchemic attitude to matter, though the addition of Stoic concepts of *pneuma*, of fields of force, was needed to make the system more coherently dynamic.

The doctrine of the *eidola* seems certainly to go back to the mages. Diogenes Laertes says of the latter: "They practice divination and forecast the future, declaring that the gods appear to them in visible form. Moreover they state that the air is full of *ēidola*, which, emitted vaporously, enter the eyes of keen-sighted seers." We have here the basis of all the views attributed to Demokritos

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in this matter: a doctrine of emanations, *aporrhiai*, which result in a host of flying images all around us. The application of the doctrine by the mages, however, seems much more limited than that of the philosopher. They seem to have devised it to explain certain phenomena of second-sight and prophecy. Demokritos, with his aim of finding a rational and materialist explanation of all the strange phenomena in the universe, took it over and incorporated it in his atomic system. However, the link with the mages is striking.[32]

If we knew more of the collection of Demokritos' works made by Thrasyllos in the first half of the first century A.D., we should be able to estimate more clearly the difference between Demokritos and Bolos. But we must assume that the collection included the works that Plinius cites, even if he was quoting from some intermediary Latin version. On the whole we are driven to the conclusion that there was much in the writings of the historical Demokritos that had affinities with the later tradition of Bolos, Anaxilaos, and Dioskorides. What Bolos seems to have added was a more precise comprehension of the principle of sympathy-antipathy, a more dynamic and organic conception of the interrelationships of all bodies in the cosmos, and the triadic formula of transformation, with its notion of a hierarchy of levels. He thus founded what we may call the dialectics of alchemy, the first fully based theory of development in forms and bodies. This theory still lacked any evolutionary background; it saw development as involving only the changes of single bodies or groups of bodies inside a universe where the hierarchical system had been established for all time. It was therefore cyclic, envisaging a movement down as equally possible as a movement up the scale. But it was none the less a tremendous achievement, charged with endless potentialities.

To bring out how the idea of vital correspondences had become more and more a part of the culture of this world, we may carry further the analysis of the sibillations in the Sword-of-Dardanos charm. The seven vowels in varying combinations were used both in magic spells and in formulas of religious incantation. The work *On Style* that goes under the name of Demetrios Phalareus states, "In Egypt too the priests celebrate the gods in hymns through the Seven Vowels, which they utter in due order; and the sound of these letters is so euphonious that men listen to them in preference



to pipe and lyre. So, if we do away with the clashing of the vowels, we simply take away the melody and clashing of speech."[33] Demetrios has been praising the euphonic effect of a succession of vowels in composition, citing Homeric forms like *ēelios* or *orēiōn*. Strange names and vowel-combinations play a considerable part in spells:

> Your Name composed of Seven Letters according to the Harmony of the Seven Tones which have their sound according to the Twenty-eight Lights of the Moon, Saraphara, Araphaira, Braamarapha, Abraach, Pertaomech, Akmech, Iaō: oueē, iaō, oue, eiou, aēē,e ēou, eeou, Iao.
> I invoke you Lord in a hymnic song, I celebrate your Holy Might, a e ē i o ō ō ō. Sacrifice after song: ē i o v ō . . .

and so on with a string of more vowels. It has been argued that, since the seven vowels were used by the Gnostics in place of the seven tones of the seven-stringed lyre (tuned on the two conjunct tetrachords of the Dorian scale) we can read the letters as notes. According to Pythagorean doctrine each tone of the scale represented the note of one of the seven planets; and so each vowel was a magical symbol of the music of the spheres.[34] The clue for determining the pitch of each of the tones represented by a vowel was found in the *Harmonics* of Nikomachos of Gerasa, who held the Pythagorean creed of the harmony of the world.[35] He stated that motion of each sphere made a sound, to which the names of the seven vowels were given. (According to Anaximandros' system, accepted by the Pythagoreans, the spheres carried the heavenly bodies in revolutions round the earth. The later form of these notions however came from Aristotle. Eudoxos had worked out a single-centred system in a purely mathematical model, with the aim of correcting the angular displacement of the planets as observed; Aristotle made out of this model a system with substantial and definite spheres.) The concordance of vowels, planets, tones, was taken over by the Gnostics.[36] Markos in his *Silence* said (according to Irenaios): "The first heaven sounds the A, the next the E, the third the long E, the fourth in the middle cries out the Might (*dynamis*) of the I, the fifth the O, the sixth the U, the seventh and fourth from the middle calls out the Element of the Omega." (The symbolism is increased by the facts that the same word, *stoicheion*, was used for letter and for element, and that the Greeks had no numbers, but used letters for them.) So we get the system.

| | | | |
|---|---|---|---|
| A | Moon | Nete | d′ |
| E | Venus | Paranete | c′ |
| E (long) | Mercury | Paramese | b♭ |
| I | Sun | Mere | a |
| O | Mars | Lichanos | g |
| U | Jupiter | Parhypate | f |
| Omega | Saturn | Hypate | e |

So much for the mystical correspondences. But it does not appear that the vowel-notes were ever actually sung. Nichomachos seems to be considering a sort of mystical utterance, since he says that the initiates invoke the god by hissings and sibillations, by inarticulate and incoherent sounds.[37] The vowels were there so that the initiate might transfer the sound from an earthly to a heavenly sphere; the earth-notes were to be transformed into the music of the spheres. Silence, *Sige*, was "the first companion of the divine name".[38] (A confused filtering of these ideas into common parlance appears in a letter of the 3rd or 4th century, where the writer, complaining of a lack of replies, remarks, "Among philosophers silence is an answer.")

When in the first chapter of Revelation Christ says, "I am Alpha and Omega, the beginning and the ending," the reference is probably not to the alphabet, but to the song of the magical vowels of the Egyptians and the Gnostics. For the vowels in that song represented the whole cosmos: the whole nexus of *dynameis* and planetary influence and harmonies that made up the living universe. Alpha and Omega in this sense have a vast and potent meaning, which is hardly shared by the alphabet as a thing by itself.[39] On magic gems we find stars put under vowels or vowels put at the end of rays round the head of Khnoubis, whose solar aspect connects him with the planets. One papyrus recommends us to say Alpha to the east, Epsilon to the north, Eta to the west, Iota to the south, Omicron to the earth, Upsilon to the air, and Omega to the sky. Sometimes the tone of the voice uttering the vowels is prescribed: thus alpha is to be spoken "with a swelling tone and an open mouth".[40]

The play with vowels probably goes far back, though not in the systematic way that we find in the later periods. Thus it has been noted that Pindar starts his first Olympian and Pythian Odes with syllables in which five different vowels appear in succession, as if he were announcing the musical theme of some great fugue. The sequences set out the five main tones of his vowel scale.[41] The



Greeks were very sensitive to such effects, and this broad statement of vowel-sounds at the outset may well have been felt to establish some sort of harmony between the poem and its theme, between the activities of men and the divine life. The suggestion is not so farfetched as it may seem at first glance. Pythagorean ideas about numbers, names and harmonies were already well-known; Empedokles was using *stoicheion* for element; Plato was soon to use the same word for a simple sound of speech—later it came to mean much the same as *gramma*, letter. In the *Kratylos* of Plato Sokrates discusses words, not as signals or instruments for distinguishing the various aspects of reality, but as vocal representations or imitations of the object: as direct mimetic effects like *baa-baa* or as phonetic expression of the inner nature of things. It is argued that certain letters naturally express physical qualities by the positions and movements of tongue and lips; even ethical and dimensional qualities, it is suggested, can be thus uttered. Though Sokrates ends by pointing to the limitations and weaknesses of these positions, they had a strong basis in Greek thinking and were to affect men for a long time. The Stoics were much concerned with matters of phonetics and euphony, on account of their doctrine of etymology: *etymo-logia*, the true sense of a word according to its origin as discovered by analysis.[42] Loukian tells of a lawsuit between Sigma (S) and Tau (T) before the Court of the Seven Vowels, in which S accuses T of stealing his property, especially in Attic. Dionysios of Halikarnassos discourses on the tone-qualities of various letters as well as on the varying emotional or ethical effects of metres. He also puts the common viewpoint that euphonious or melodious speech was a sort of spell cast on the listener:

> Who is not swayed and held as if by magical incantation, by one melody of speech, yet quite unaffected in such a way by another, or placated by one kind of rhythm and exasperated by others . . .
>
> [The author should] join together words that are melodious, rhythmical, and euphonious, by which the hearing is touched with a feeling of sweetness and sweetness . . . or he should intertwine and interweave those which have so much natural effect with those that can bewitch [*goeteuetai*] the ear so that the unattractiveness of the one set is overshadowed by the grace of the other.[43]

Thus a general idea of words as capable of magically captivating effects led to precise and detailed formulations about particular vowels or sibillations, which, playing their part in cosmic

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correspondences, could compel both gods and men in desired directions. Magic, we may note, did not merely operate by the (supposed) laws of sympathy-antipathy; it also sought to a great extent to change a given situation—to introduce new qualities into it. To send love into the mind and body of someone who previously did not feel that love. To this extent it was allied to alchemy, as it was also in many of the materials it used, and in the frequent use of fire to bring about the desired change.

# 7

# Ostanes

We have seen the important role that Ostanes the Mage was said to have played in the crucial moment that brought about the birth of Alchemy. His formula it was that enlightened Bolos, who had been wandering in a maze of facts or recipes about the possible combinations and mixtures of matter, the *diaphorai* of *hylē*. Was the tale of his role as master of Bolos-Demokritos a mere fantasy? or does it hold an essential clue to the meeting of thinkers, or the confluence of traditions, which created the new science? Diogenes Laertes tells us:

> [Demokritos] was a pupil of certain Mages and Chaldaioi. For when King Xerxes [during his invasion of Greece] was entertained by the father of Demokritos [at Abdera], he left men in charge, as in fact is stated by Herodotos; and while yet a boy, he learned theology and astronomy.[1]

This is a very free interpretation of what Herodotos says. The story may have come from the later writers of treatises *About the Magoi* or from Hekataios, also of Abdera. Plinius adds that the mage Ostanes accompanied Xerxes on his expedition; but no one seems to have said that Demokritos as a boy met him at Abdera. However the latter may well have seen and heard of the mages at the time when the Persian army passed through his town. For Plinius, as for the pseudo-Damigeron, Ostanes seems the chief of the mages, not Zoroaster. We also find him called, in an oracle, King of the Heptathongos, revealer of the invocation-formulas with special effect on planetary deites. The *Heptathongos* appears to mean the seven-corded lyre, emblem of the harmony of the spheres and suggesting the seven vowels.[2] But for Plinius the masters of Demokritos are Dardanos and Apollobeches. He also knows of another mage Ostanes who accompanied Alexander on his victorious travels. (Here there is a suspicious parallelism with the

first Ostanes who accompanied Xerxes. Perhaps the Persians wanted to say: Our own great invasion under Xerxes failed, though Ostanes was there; but we still had our prophet with the counter-expedition of Alexander, which won.) However the name may have been common or handed on by father to son, as we find in the story of the initiation of Bolos-Demokritos.

Plinius, who looks on the mages as the inventors and propagators of magic, is bitter against Ostanes. He cites the most unpleasant recipes. Thus for an aphrodisiac, "The right testicle of an ass taken in wine or a bit of it worn as an amulet on a bracelet; or the foam of an ass after copulation, collected in a red cloth and enclosed, as Ostanes tell us, in silver."[3] The great power of the mages, he says, built up over many ages, results from an interweaving of medicine, religion, astrology. Thus, "magic rose to such a height that even today it has sway over a great part of mankind." He asserts, "without doubt it arose in Persia with Zoroaster. On this our authorities are agreed."

> The first man, as far as I can discover, to write a yet-extant treatise on Magic was Ostanes, who accompanied the Persian king Xerxes on his invasion of Greece, and sowed what I may call the seeds of this monstrous craft, infecting the whole world by the way at each stage of their journeying. A little before Ostanes, the more careful inquirers place another Zoroaster, a native of Proconnesus. One thing is certain. It was this Ostanes who chiefly roused among the Greek peoples not so much an eager appetite for this lore as a sheer mania.[4]

Elsewhere he speaks of the blood of gladiators drunk by epileptics, "though we shudder with horror when in the same arena we look at even the beasts doing the same thing." They liked best to suck blood from a living man.

> Others seek to secure the legmarrow and the brain of infants. Not a few among the Greeks has even spoken of the flavour of each organ and limb, going into all the details and not excluding nailparings—as though it could be thought health for a man to become a beast and to deserve disease for the very remedies he begs. And by Hercules, well deserved is the disappointment if these medicines prove useless. To look at human entrails is considered a sin. What must it be to eat them? Who was the first, Ostanes, to think of such devices as yours? For it is you who must bear the blame, you destroyer of human rights and contriver of monstrosities.[5]

Then he goes on: "Granted that foreigners and barbarians discovered the rites, did the Greeks also have to make these rites



their own? There is extant a treatise by Demokritos stating that a complaint is more benefited by bones from the head of a criminal, and other complaints by those of a friend or guest."

The works written under Ostanes' name dealt with plants and stones, as did those of Bolos. In these works as in those attributed to Zoroaster, stones were considered alive; they are described as acting together with animals and herbs in the composition of charms. The process of differentiation that sets in later does not here seem very advanced.[6] Thus in an extract from Tatian (which agrees with a passage in Nepoualios, who is himself full of borrowings from Bolos) we read how in dealing with derangements of the spirit roots and herbs act together with a mixture of sinews and bones; then there is the question of the instinct that drives animals to eat herbs that will cure their maladies.[7]

Under Nero, Pamphilos of Alexandreia composed a sort of polyglot dictionary of plant-names (source of many items in the *Herbarius* of the pseudo-Apuleius as well of marginal notes on some MSS of Disokorides); he noted Persian or Aramaic words that Ostanes had used.[8] At least in part he seems certainly to have been using works of Bolos. Plinius in the passage dealing with the *Cheirokmeta* of Bolos-Demokritos, stated that his author had reproduced also the magical names of all the plants mentioned. Bolos no doubt had found in the works of Ostanes and Zoroaster or their successors *nomina barbara* which the thaumaturges recommended for use in spells. It was this part of his work that Pamphilos drew on.[9] If however we may trust the pseudo-Apuleius and pseudo-Dioskorides, the works under Zoroaster's name used only Greek terms, often explaining the plants' virtues by their etynology, while Ostanes seems to use almost all foreign words. It would follow that the Alexandrian scholars had a book *On Nature* by Zoroaster with practically everything, apart perhaps from a few Aramaic names, done into Greek, while the version of those under Ostanes' name largely transliterated the names and formulas.

As for stones, Plinius mentions Zoroaster among his consulted authors, but not Ostanes, who, though cited for other matters, is never singled out as an authority. Plinius' sources could not have mentioned any specific work of his.[10] Only the pseudo-Damigeron in his Latin lapidary mentions the name. This lapidary, ostensibly dedicated by the King of Arabia, Evax, to Tiberius, was at least written two or three centuries later; the

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text on which the work was based however was clearly Hellenistic.[11] From this latter many lapidaries give us extracts, *e.g.* the Orphic *Lithika* in verse (4th century) or Aetios of Amida. The pseudo-Damigeron omits the more bizarre bits of pagan magic, *e.g.* the stone *synoichites*, which evokes the dead in Plinius, is soberly described. But, though he brings new elements in, he preserves much of his original. When he remarks that the mages' statements, though they may seem odd, rest on genuine experiences, he is perhaps drawing on Bolos and Xenokrates in their borrowings from Demokritos.[12]

We must now look in a broader way at the Iranian tradition represented by Ostanes. In Roman times there was in circulation a literature composed in Greek and headed with the names of the three mages, Zoroaster, Ostanes, Hystaspes. The background was Iranian. The universe was seen as formed by two conflicting principles or forces, light and dark, and a Saviour, born of Zoroaster's seed was to descend into the lower world. We meet traditions of Zoroaster changing his appearance so as to be identified with the prophet Seth, son of Adam, and of his descendant Saoshyant becoming a form of Jesus. For this reason we get the journey of the Mages to pay homage to the baby Jesus. The books under the names of the three mages went back at least to the 2nd century and helped to provide much of the mythological framework of Egyptian Gnosticism. Under Hystaspes' name oracles predicted the end of the world, which was to be preceded by the fall of Roman power. The authorities sought to ban the predictions. So wide was the fame of the mages that Arnobius imagines an unbeliever saying of Christ, "He was a *magus*. He did all his deeds with secret arts, he stole the name of mighty angels and far-off disciplines from the sanctuaries of the Egyptians."[13]

The contact of Greek and Persian cultures went far back. In the 5th century, before Herodotos, Xanthos the Lydian mentioned Zoroaster. Mages had already moved in from the east and lighted their pyres in Lydia. Anaitis, the Persian Artemis, had a temple at Hypaipa and at Hierocaesareum, the latter reputed to have been founded by Kyros. And, before Artaxerxes Ochos put up a statue of her at Sardeis, she seems to have had another temple there.[14] Dionysios of Miletos, who composed in Ionian a *History of Persia* from the death of Dareios in 516, dealt with the mages.



Persians were established in colonies in the plain which took from them the name of the Hyrkanion Pedion and which had a village Dareiou Kōmē.[15] Other Persians lived at Ephesos by the sanctuary of Artemis, to which they had given the Highpriest, the Megabyzos. The great altar at Pergamon was a fire-altar like the *pyraitheia* of the Persians, as also was that at Magnesia where Artemis was identified with Anaitis. In the north at Daskylion a 5th-century relief represented the mages sacrificing according to the Mazdean rite.[16] The list of authors dealing with the mages is extensive and shows that there was considerable interest in them.

Already Herakleitos of Ephesos, who flourished at the end of the 6th century B.C., knew of the mages: "Nightwalkers, *magoi*, bacchantes, revellers and participants in the mysteries! what are regarded as mysteries among men are unholy rituals." But though he thus expressed distaste for the popular festival-excitations, he himself was deeply affected by the mysteries and wrote his book in the hermetic style of a mystery-book or of the orphic *hieroi logoi*; the few liturgical fragments surviving of the Eleusinian Mysteries show the same antithetical form as his writings. Born of an ancient royal family, he was by right of birth a priest-king and he composed in an hieratic idiom.[17] The importance of fire in his thinking suggests a strong magian influence. Though it would be incorrect to call his terms alchemic, we can see in them the elements that were coming together to form the science of Bolos.

> Fire for him was neither a mere symbol of the universal process nor a substrate persisting as identical throughout its qualitative alterations. He speaks of it both as a token for exchange like gold in trade and as involved in change itself; and it was the easier for him in this case to identify the sign and the thing signified, since fire does appear to be the one existing phenomenon that is nothing but change.[18]

In comparing fire with gold he is equating the way fire changes all things with the way money upsets and thows into flux all human relationships; but the link is none the less interesting for us here. Basic in his thought is the notion of the ceaseless conflict of opposites; and he sees fire as a transformative force, as in the cryptic statements:

> [The phases of fire are] craving and satiety.
> It throws apart and then brings together again; it advances and retires.

The transformations of fire are first sea, and of sea, half becomes earth, and half the lightning-flash.

The thunderbolt pilots all things.[19]

The flash and the thunder are not opposed in ancient thought; each term suggests both something seen and something heard. The thunderbolt here seems to represent fire as a formative as well as a destructive principle, so that there is a suggestion of a guiding force in the transformation, though in view of the hermetic idiom we cannot press the point. The flash, *prēstēr*, however, seems the active principle operating on water and earth. In a wild florid way we find the same ideas and images in the Chaldean Oracles, eight centuries or more later: From the First Intellect, we there are told, "spring in abundance the implacable Thunderbolt, the lightning-receiving Wombs of the all-illuminating Rays of the father-begotten Hekatē, the guiding Blossom of Fire and the strong *Pneuma* beyond the fiery poles."

There is no need here to trace further the writers concerned with the Mages, but we may mention Ktesias who was physician at the court of Artaxerxes Mnemon in the later 5th century; Dinōn in the 4th century who feels the need to defend the mages against the charge of wizardry and to define *mageia* as the service of the gods; Eudoxos of Knidos, an important astronomer, who denies the value of horoscopes, but finds value in the dualistic outlook, identifying the two principles with Zeus and Hades—he is probably the main source of information about the mages for Plato and his school. Plato's myth of Er, the man returned from the dead, seems Iranian. Other writers much concerned with the mages were Hermodoros of Syrakousa, Herakleides of Bithynia, Eudēmos of Rhodes (who studied the Zervanism being adopted by some groups of mages, with its idea of resurrection followed by immortality), Klearchos of Soloi (who was interested in fakir-types of endurance), Theopompos, Hekataios of Abdera, Poseidippos the Stoic, and so on. Aristotle in his work *On Philosophy* dealt with the harmony of the world conceived as a great temple, the Great Year, the periodical return of the same ideas in human thought: views that are linked with those in the platonic *Epinomis* and with those set out by the mages around Xerxes. He seems to have thought the foundation of Plato's Academy represented a rebirth of the spirit of Zoroaster; he mentions 6,000 years as intervening between Zoroaster and Plato.[20] After Alexander's victories



Persia was opened up to Greek inquiries and influences, and continued its own westward flow of ideas and images. Stoicism in many ways provided something of a meeting ground for east and west.[21]

Common among the tales or motives borrowed from the mages were those dealing with visits to the underworld or callings-up of the dead. We have noted Plato's tale of Er. In the *Axiochos* we hear of a description of the underworld inscribed on ancient *stēlai* found in Apollo's Delian temple; the author of this fiction borrows from a traditional list of mages the name of his Gobryes, the revealer of a new eschatology. Klearchos in his book *On Sleep* recalled the interest of Aristotle in the way the "psychagogic wand" drew a child's soul from his body. The child had fallen into a lethargy (? how induced); and the wand gave him hallucinations. On waking he recounted all that had apparently happened as if it were fact, so that the event seemed a death followed by resurrection.[22] In Herakleides, Zoroaster was presented as the prototype of the initiate who, by the gift of second-sight, penetrated the mysteries of the otherworld and was able to testify as to the voyages of the soul borne by its aithereal body into the spheres beyond.[23] Further tales of resurrections or supernatural visions are told by Cornelius Labeo or by Loukian. The latter makes his Menippos say, "I resolved on going to Babylon to beg the aid of someone of their mages, the disciples and successors of Zoroaster; for I heard that by certain incantations and rites they open the Gates of Hades, lead safely down anyone they choose, and bring him back again." In Babylon Menippos after much trouble persuaded a mage, Mithrobarzanes, to help.

> Under the mage's tuition, he enters on a course of purificatory and mystic rites, with a strict dietetic regimen, till he is properly prepared for the dreadful descent. Embarking on the Euphrates, they sail to a certain prescribed place, where they leave their boat, and begin the prescribed infernal rites and sacrifices—still faithfully following the authority of the poet of the *Odyssey*—invoking Hekate, the Erinyes, and all the Daimons. The earth opens and the various infernal sights are revealed. Descending, with much difficulty, the travellers secure places on board Charon's boat, already overladen with dead men, who have mostly come to their end in battle. . . .[24]

It is therefore significant that the one case where the conjuring-up of a dead man occurs in the alchemic manuscripts, it is in connection with the mage Ostanes. This detail supports the

argument that Ostanes in the legend of Bolos stands for a genuine mage-master or for Iranian influences in Bolos' thought.

We then have abundant evidence that from the 6th century B.C. onwards the Greeks were aware of Mazdean ideas; and two major thinkers, Herakleitos and Plato, seem to have been deeply affected. The Iranian influences which thus flowed into the Greek world was however very far from the earlier Zoroastrian bases. When Kyros took Babylon, he introduced there many mages, as indeed he did all over Mesopotamia. In official rites they took precedence over the native clergy of the *Chaldaioi*. Babylon was at this time the centre of the scientific world, leading the way in astronomy and mathematics. There the mages learned how to interpret eclipses according to astronomical systems. Their supreme principle became Time regulating the movements of the sky; and the life of the world, till the destruction, was divided into millennia, each under a planet. Ahura-Mazda, their beneficient God, was identified with Bel and other Avestic deities were assimilated to the Babylonian pantheon. The *magousaioi* who carried the new form of the Mazdean creed into western Asia Minor spoke Aramaic and could doubtless not read the sacred books of Zoroastrianism. Mithraism emerged as fusion of Persian and Chaldaic cults.[25] The *magousaioi* long survived in Asia Minor. Strabon saw them at work in Kappadokia, where they were called *pyraithoi*, fire-kindlers, with shrines called *pyraitheia*.

> In the middle of these is an altar, on which is a great amount of ashes, where the *magoi* maintain an unextinguished fire. They daily enter and carry on their incantation nearly an hour, holding before the fire a bundle of rods, and wear round their heads high turbans of felt which reach down on each side so as to cover the lips and the sides of the cheeks. The same customs are kept in the temples of Anaitis and of Omanos. Belonging to these temples are shrines, and a wooden statue of Omanos is carried in procession. These things we have seen ourselves.[26]

Victims were not slit with a knife but beaten to death with a log of wood as with a mallet. Pausanias in Lydia, saw the sanctuaries of Hypaipa and Hierokaisareia; in each was a chamber with an ash-piled altar. "But the colour of these ashes is not the usual colour of ashes. Entering the chamber, a magician [*anēr magos*] piles dry wood on the altar; he first sets a tiara on his head and then sings to some god or other in a foreign tongue unintelligible to Greeks, reciting the invocation from a book. So it is without fire that the wood must catch and bright flames dart from it." Pausanias says



he has seen the marvel.[27] Persian colonies were still there at the time of St Basil.[28] One aspect of the later beliefs may be mentioned here. Zervan, we learn from Syriac sources, was four-shaped. Three activities or manifestations of Time were personified and linked with him to make up the supreme being. It has been suggested that the triad or trinity represented three stages of life; more likely they stood for three stages of development in a philosophic sense like those we found in the formula of Ostanes, with Zervan himself as the all-inclusive unity within which the stages worked out their conflicts, changes, stabilities.[29] Mani the great Babylonian reformer put at the head of the divine hierarchy the Father of Greatness (*Megethos*) with Four Faces, his hypostases were Light, Power, Wisdom; and Iranian texts translated his name as Zervan. In Zervanism, as in Mithraism, Time has for its manifestation the Heavens; and all good and evil is the work of the 17 Zodiacal Signs and the 7 Planets.[30] It is important to note that the mathematical and geometrical sciences had in essence been dealing with a timeless world, that it was the ideal of the classical Greeks in general to get rid of time as a nuisance which caused accidents, distortions, confusions disturbing the rule of pure abstractions, and that it was only with alchemy that time really comes into the picture in the scheme of a triadic set of qualitative changes. The affinity with the fused Iranian-Babylonian systems is clear. Not that we can look for definite alchemic schemes among the *magousaioi*. But the notion of time as consisting of different phases, all leading to a coherent conclusion, was something quite unlike the Greek systems, which either saw a degeneracy in general or a cyclic movement. It was a precondition of the more precise and dynamic formulation of Ostanes-Bolos, which gave change a specific pattern of qualities (colours) and saw it as issuing in something new.

We may note that the term *pyraithes* turns up oddly in a mortgage contract of Oxyrhynchos, dated 30 March 154 A.D.; both parties are there described as priests of "Athena Thoeris the Mighty Goddess", *Megiste*. Family-names, Psenephthas and Hephaistas, show a connection with Ptah and Hephaistos, metallurgical gods, so probably the work of fire-lighting was hereditary. (The link of Thoeris with Ptah is rare, but a Ptolemaic inscription calls her Beloved of Ptah.) We have no way of associating these fire-kindlers with the *pyraithoi* of Kappadokia; but the similarity of name is interesting.

Now if we turn to the alchemical methods attributed to Ostanes we find that they do not consist of Egyptian methods of grilling or of projection; they take the Persian way of soaking and then of heating, cooking.[31] The commentary of Synesios says that Ostanes remained true to the metallurgy of his homeland; he used only the wet way.[32] This statement agrees with the *Letter to Leukippos* where Bolos-Demokritos, setting out the doctrines of the Persian prophets, also rejects the Egyptian ways. "We don't do it like that," *i.e.*, not like the Egyptian prophets who have just been cited. Synesios also refers to two catalogues in which were listed the wet and the dry ways of making gold and silver.[33] We find Ostanes linked with Maria the Jewess in the Demokritean tradition, according to the *Kitab al- Habib*:

"Explain to me," she said, "what you have related about Ostanes, who spoke of the two coppers, iron, lead, tin, and silver, who has set down a particular operation for each of these metals, and who has declared that through the operation they become gold."

"That is impossible and absolutely false. Only the ignorant believe in such a thing. Ostanes said that only to put the ignorant off the scent. I have taught you that we do not need all the bodies you have just mentioned. What we want is an unique body, enclosing a unique tincture. Always this tints only when it has itself been tinted, and it is only at that moment it tints. That's why Demokritos has said: If you want to find the composition, you will be able to tint all bodies, with God's aid."[34]

This book derives from the Greek alchemists, and particularly from the *Physika and Mystika*. The point of the argument is that there is only one operation or principle at work in transformation. Bolos-Demokritos repeated this idea several times, "There is no need of these" [the bodies], and so on.[35]

From an alchemic extract in a Syriac MS we learn that Ostanes was strong on the need for secrecy:

As for Ostanes . . . [he orders] that no one is to dare to alter his books . . . not to dare to make additions or suppressions . . . He orders everyone and lays down that his words are not to be made known to the vulgar. He utters terrible oaths against their revelation to anyone, save to a man worthy of them, a man who seeks the truth and loves God, who owns the fear of God, a man who is full of pity for the poor and distant from all evildoing, and who doesn't use his time as do abandoned men and women.

He has covered up the mysteries with the same care as the apple of his eyes; he has forbidden the handing of them over to unworthy disciples.

That is why all philosophers have veiled the language of their discourses and have put one sense in place of another, one name in place of another, one passage in place of another, one species in place of another, one vision in place of another.[36]



This attitude went back to Bolos. Synesios wrote to Dioskoros, "The philosopher [Demokritos] called things by many names, both individually and collectively, so that he might train and exercise us and see if we were understanding." The Stone is called "the manynamed and nameless". We hear: "I speak to you men of good sense . . . so that we may escape the incurable disease of poverty." Kedrenos says that Demokritos "taught that it is necessary to keep apart from all bad men". There was indeed a widespread feeling that secrecy was in the nature of things; that secrecy lay at the beginning and end of quest, discovery, revelation. When an Epicurean accused Plato of giving up demonstrable truth for falsehood in the guise of poetic myth, Porphyrios replied that myth was natural. "Nature loves to hide herself."[37]

We have a *Letter of Ostanes to Petasios*, written in a deliberately obscure style. It deals with the making of the Divine Water by means of various operations carried out in a glass alembic; then an immersion of two mingled mixtures for a day and a night in seawater. The product can kill the living and revive the dead. A small drop is enough to create light or darkness, to vaporise seawaves or dissipate fire, give lead the look of gold, give sight to the blind, hearing to the deaf, and speech to the dumb. But the writer is using allegories and warns the reader as to the real bearing of his text by putting alchemic signs (of gold, mercury, cinnabar, magnesia, sulphur, silver) above words that do not mean those substances. He concludes with the triadic formula. Perhaps we can see a trace of Iranian dualism in the stress on death and life, dark and light.[38] The geographical area suggested by the Letter is not Egyptian, Syrian, or Mesopotamian, but Asianic; there is a reference to Mt. Olympus (of Lykia), Libanos, and Tauros. The writer seems connected with a part of Asia Minor where there were many mages.[39]

Petasios (Isis-gift) here appears as a fellow-disciple of Ostanes or a disciple of Demokritos. He is given the authorship of *Demokritean Memoranda*, and appears several times in alchemic literature, mostly in the work of Olympiodoros, where he is mentioned as

one of the initiated who could speak of the art without too much obscurity.[40] A Syriac text, if rightly amended, makes him say that meditation is necessary and that love of the art (disinterested research) is enough for success.[41]

An Arab MS entitled *The Twelve Chapters by Ostanes the Philosopher on the Philosopher's Stone* deserves a few words.

> Those who have defended the secret at sword-point and have abstained from giving it a name or at least from giving it the name under which the crowd knows it: they have hidden it under the veil of enigmas . . .
>
> Among the epithets they have applied we find: running water, eternal water, burning fire, fire that thickens, dead earth, the hard stone, the tender stone, the fugitive, the fixed, the generous, the rapid, that which puts to flight, that which struggles with fire, that which kills by fire, that which has been unjustly killed, that which has been taken by violence, the precious object, the valueless object, the dominant glory, the debased ignominy.
>
> How dear it is to him that knows it. How glorious for him who practices it. How mean for him who ignores it. How infinite for him who does not know it. Everyday everywhere we hear the cry: O host of seekers, take me, kill me, then, after killing me, burn me, for I'll revive after all that and I'll enrich whoever has killed and burned me.[42]

The concept of initiation-ordeals and death-rebirth is applied to the alchemic bodies in their changes. This analogy is not drawn on by any accident; for it was in initiation-experience that men had managed to express and develop the idea of movement from one level of life to another level qualitatively different—from childhood with its mother-world to adulthood with its totally different set of relations and responsibilities, its new lores and understandings, and so on. Alchemy above all represents the scientific application of these initiation-ideas of a leap from one qualitative level of life to another; and that is why the alchemists keep returning to the analogy of ordeals, tests, resurrections. And they do not do so for any simple reasons of needing an analogy drawn from human life that helps to provide a schemata of stages and to make the whole mysterious process of chemical change more comprehensible. They do so also because they genuinely feel a union between natural and human process; they are affirming a vital and organic relationship to nature which the abstract or timeless approach, with its emphasis on the alienated intellect of men, had denied.

Further, in the continual paradoxes of glory and infamy,



inestimable value and despised cheapness, we feel a link with the gospel creed that the last shall be first, the despised will turn out to be the chosen. Behind the antitheses lurks an element of social revolt, nurtured to some extent by the feeling that the alchemist is outside all the accepted cultural values and that in his obscurity he is struggling for a secret of change that can give him mastery over process. We find the assertion of the disregarded omnipresence of the Water, the Stone, as a commonplace in alchemy as it develops. Thus, Ibn Umail, after the passage cited where he says that only the Men in the Egyptian Temples can make effective use of the Water, goes, " 'O King, is it to be found when sought for?' Marqunas said, 'Yes, no commodity is sold in the world more than it, and everyone requires it, and everyone possesses it, and it is necessary for everyone to have it.' He means by his statement This Water, because the Water is found in every place, in the plains and in the mountains, with rich and poor, with strong and weak. This is the parable that all the Sages quote about their Stone; it is the Water, the Humid Spirit." It is the essence of life, of development, but only the alchemists seek to grasp and understand its laws, enter consciously into its processes.

The *Twelve Chapters* go on:

> Don't you see that it fights fire, nothing is more hostile to fire than it is. When put in fire, it makes a crackling like congealed water that disintegrates by action of cold and snow.
>
> Know, seekers, that it is a white water which is found buried in the earth of India, a black water which is found buried in the land of Chadjer, a red brilliant water which is found buried in Andalusia.
>
> It is a liquid that bursts in flame at contact with wood into a violent fire; a fire that lights itself at stones in the countries of Persia; a tree that grows on the peaks of mountains; a young man born in Egypt; a prince come from Andalusia who desires the torture of the seekers. He has killed their chiefs and made of some of them the runners of princes. The wise men are powerless to fight him. I see no arms against him but resignation, no other steed than science, no other shield but intelligence. If the seeker confronts him with these three weapons and kills him, he'll come to life again after his death, he'll lose all power against him and will give the seeker the highest power so that he'll arrive at the goal of his desires.

And so on. We are reminded of the wood on the Lydian altars that catches fire of its own accord, and of the experiments (we cited one recipe of automatic fire in chapter 3) leading on to

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Greek Fire. The young man born in Egypt perhaps refers to the struggle of a young man against a dragon beside the Nile, which is recounted in *The Book of Krates*—another version of initiation-ordeal.[43]

The style of the *Twelve Chapters* shows that it derives from the period when alchemic ideas were set out in elaborate rhetorical fashion, with much antithesis and heaping-up of synonyms. But the essential ideas are much earlier; and as the points are strongly and clearly made, we may cite some more passages that seek to stress the paradoxical nature of the secret. Needless to say, the Aristotle here cited is an apocryphal figure:

I have heard Aristotle say: "Why do these seekers turn away from the stone? It is however a wellknown thing, characterised, existent, possible."

I replied, "What are its qualities? Where is it found? What is its possibility?"

He told me, "I'll characterise it by telling you it's like lightning on a dark night. How can one fail to recognise something white showing up against a black background? The separation isn't painful for anyone accustomed to distance. Night cannot be dubious for him who owns two eyes."

We are again reminded of Herakleitos' lightning flash that guides all things. There is no direct connection, but ultimately the two concepts are the same. The alchemic moment is that when the reality of change, process, development is abruptly realised in its fullness. The universe of purely repetitive or quantitative movements, circular and reducible to mechanical formulas, is split by a force which exists outside all those formulas; and the vision of the man who grasps what is happening has similarly leapt on to a new level of comprehension. A guiding principle of qualitative change, a formative principle, has been realised inside the unitary process. The difference between the alchemic image and that of Herakleitos is that the latter is largely intuitive, whereas the former has a more precise body of formulations about the nature of process associated with it.

As for the places where one finds this stone, they are the houses, shops, bazaars, roadways, public stores, mosques, baths, towns, cities. One finds it in the earth and in the sea.

As to its possibility, I'll state that it is a stone bound up in a stone, a stone fitted into a stone, a stone englobed in a stone. The philosophers



have shed tears on this stone, and when they've flooded it, its darkness has disappeared, its sombre colour has been lightened, it has appeared like a rare pearl. Its possession has been assured and the seekers have been amazed.

The point here is that there is nothing in the quest that carries the seeker into strange and remote aspects of life or matter. The processes of transformation are going on all the while, everywhere, all round one. The difficulty is not to track them out, but to understand them. The mystery lies in the transformation itself, not in some situation or material cut away from common life. The tears of the sages are the divine water of transformation, which resides in human beings as much as in any metals or minerals, any herbs or flowers, any stars or planets. The reference to a stone-in-the-stone is then not to magic stones like the *aetites*, or eaglestone, about which may strange things were said: for instance that "it has inside itself another stone as if pregnant," and so has various uses aiding a woman's pregnancy and preventing abortion.[44] The *aetites* is merely a peculiar instance of birth-powers concentrated in a stone. What the alchemists were talking about was an omnipresent formative movement, which is shared by both men and the organic and inorganic objects of nature.

The Sage has said, In the following words Aristotle has indicated the stone's qualities and given a description of it. "It is a Lion reared in a forest. A man has wanted to make use of it as a steed by putting on it saddle and bridle. Vainly he has tried; he cannot succeed. He has then had recourse to a shrewder strategem, which has permitted him to keep it in stronger bonds, and so has managed in saddling and bridling it. Then he has tamed it with a whip, giving it grievous blows. Later, he lets it loose from the bonds and makes it walk along like a degraded being, so that anyone would say it had never been wild for a single day." The Stone is the Lion; the Bonds are the Preparations—that is, the matters I'll discuss in the next chapter. The Whip is the Fire. What do you say, seeker, of this so-clear description.

Here is another account given by the Sage. "What then are men thinking of? They talk of the stone but get nothing out of it. They wrap it up, they use it as salves for dealing with scab that covers the body and they draw no advantage from it. They tread it underfoot and yet never get hold of it."

Another Sage has said, "I've lived now forty years and I've never spent a single day without seeing the Stone day and night so well that I was fearing nobody could help seeing it too. I then used yet more enigmatic expressions than those I'd used at first and I have increased

the obscurity of the phrases out of fear that their sense was already too plain."

Know then that the authors in their books have used a great number of words to denote the Stone. I'm going to mention the easiest ones, leaving aside the majority of such words and choosing those which are, as far as I know, the ones best known in the world. It is called: lion, dragon, serpent, viper, scorpion, water, fire, torrent, congealed or dissolved [body], vinegar, salt, dog, Hermes, mercury, jackal, page, serving-maid, gazelle, courser, wolf, panther, monkey, sulphur, arsenic, tutty, foam of silver, iron, copper, lead, tin, silver, gold, talc, tulac, tirac, tarc, dumb man, oppressor, submitted [being], magnet, fat, spirit, soul, oil, collyrium, urine, bone, vein, Saturn, Barkhis [Balti = Venus?]. Mars, Sun, Moon . . .[45]

We see here a contradiction. The alchemists insist on the universal nature of their quest and its goal, and on the way in which the examined processes are part of common life. They talk of curing poverty; they want their science to enter into life at every point. And yet they treat their learning as something that must at all costs be kept among a few dedicated seekers and never unveiled to the masses. We shall later consider the full reasons for this position, but here we may note one point. The alchemists were not concerned with producing gold for their own benefit, even if a practioner now and then tried to cash in on his lores and impress a ruler (Gaius or Anastasios). They felt themselves forever trembling on the innermost secret of universal process, and they wanted to clarify and stabilise their grasp of this secret before they worked out the applications of their knowledge. They were convinced that at the stage in which they found themselves the divulging of their methods would mean their debasement. Men would be eager only to find gold for reasons of greed and self-aggrandisement; and the deeper motives of the quest—the search for pure knowledge and insight into process, with a hope of some kind of ultimate elixir and control of nature (and of human life itself)—would be compromised, corrupted, and dissipated. We may add that perhaps they were also only too aware of the gap between their actual knowledge and the high claims they made, between the actual products of their experiments and the exalting intuitions and momentary certainties they produced. They felt that to make their proceedings public would be to expose themselves to ridicule. Their deep convictions, still incapable of clear and direct proof, would be mocked-at and they



themselves would lose their sustaining faith. I do not mean that they thought quite in these terms but that something of this sort of conflict went on in their minds and emotions.

In the same manuscript as the *Twelve Chapters* is another, *The Book of Thirty Chapters*, in which we gain a picture of the ordeal of Ostanes himself.

When I realised that love of the Great Work had fallen into my heart and that the preoccupations I felt about it had chased sleep from my eyes, that they prevented me from eating and drinking so that my body was wasting away and my appearance was bad, I gave myself up to prayer and fasting. I begged God to drive out the miseries and cares that had taken hold of my heart, and put an end to the perplexed situation in which I found myself.

While I lay asleep on my couch, a being appeared to me in a dream and told me, "Rise up and understand what I am going to show you."

I rose up and went off with this person [Hermes Trismegistos?]. Soon we arrived before Seven Gates so fine that I had never seen the like. "Here," my guide said to me, "are found the treasures of the science you seek."

"Thank you," I replied. "Now guide me so that I may penetrate into these dwellings where you say are found the treasures of the universe."

"You will never penetrate there," he answered, "unless you have in your power the keys of those doors. But come with me. I'll show you the keys of those doors."[46]

The Seven Doors are the seven planetary metals conceived as essential steps in the construction of matter; they are also the seven stages of the Mithraic initiate and the seven planet-gates of the ascending soul. The imagery goes back to the ancient Mesopotamian ritual-myth of the goddess Ishtar coming down to the underworld and discarding a veil at each gate; the naked goddess at the end is truth in its pure revelation.

Ostanes goes on with his guide and comes on an animal such as he'd never seen the like. It had vulture-wings, elephant-head, dragon-tail, and each of the three parts was trying to devour the other.

When I saw it, I was filled with a keen terror and changed colour. My guide, seeing my condition, said, "Go up to this animal and tell it: In the name of mighty God, give me the keys of the doors of wisdom."

Then, though full of terror and dread, I made my way to this animal and said to him the prescribed words. He handed me the keys. I opened the gates and arrived at the last one. I found myself confronting

a plaque with a shining and multicoloured aspect. When I looked at it, I couldn't possibly sustain the lustre.

The monster is the triadic formula, or rather the metals undergoing the ordeal-transformation in its terms. (This symbolic fact obscures the difficulty of wings or a tail preying on a head.) The bright plaque is the ultimate unity in which all colours are merged; the philosopher's stone which in medieval days was called both peacock and rainbow. Now in the narrative we again meet the magical number seven; for the plaque was inscribed in seven tongues. The seven tongues are another seven gates through which the goal of *gnosis* can be reached. The motive was probably introduced because of the tradition, found in Syriac texts, that Zoroaster produced the *Avesta* in seven tongues; the list varies but seems to be meant to refer to the seven regions or climates of the earth. Perhaps the seven versions of the *Avesta* in turn were invented as a counterblast to the propaganda of the prophet Mani, who had boasted that he himself wrote his scriptures while Jesus and Zoroaster had to get others to do it for them. Mani had also ordered a translation of his works in seven tongues. An Arab evangel of Christ's infancy says, "She, [Mary will bring forth], without breaking the seal of her virginity and . . . her good news in the seven climates of the earth."[47]

The first inscription was in Egyptian and Ostanes read it. We meet the triadic principle applied to the individual and his struggles towards a deepened consciousness; we are reminded of Mani's trinity of Light, Power, Wisdom.

I am going to set out for you the allegory of the body, the vital spirit, and the soul [*i.e. soma, pnenma, psyche*]. Study it with your reason and your intelligence, and, if you give it all your attention, you will be set well on your way to accomplish each work and to learn all that is hidden.

Body, soul, and spirit are like lamp, oil, and wick. Just as the wick can't serve a lamp without oil, so the spirit cannot be of use in a body without soul. The vital spirit of the body is the blood; the soul its breath which spreads itself out in blood and heart right up to the extremities of the body—and this last, you know, consists of flesh, blood, sinews.

Know that if you lodge the spirit alone in the body without bringing the soul in, the body would have no source of light; it would be as if wrapt in darkness. When you make the soul penetrate it, the body finds affinity with it, is purified and takes on a handsome aspect.



Grasp well what I'm going to tell you, for it's an important matter and nobody could be led to the hidden science of which I speak if he did not know this chapter. Don't you see that fire possesses a brightness, of rays and of lustre. If you sprinkle it with water, the brightness and the lustre vanish and it becomes darkness after having been brightness.

If you take fire and water, and by working as we set out in the present book you succeed in mingling and combining them, neither of the two will be able to hurt the other any more and their union will give twice as much brightness and rays as when they were in their primitive state. That is how you must begin; for that's the way your predecessors began. At the outset the primitive elements were fire and water. It's by coupling water and fire, by combining them, that are formed numerous bodies, trees and stones. The right course is then to proceed by analogy, acting for the final science in conformity with the method followed in the primitive science.

*Pneuma* is that in every man which links his body-soul with the living universe. Soul is the individual life activating the body and enabling it through the *pneuma* to achieve universality. The lamp-metaphor, dealing with separated things, is not very illuminating for a matter of process; but its general implications show how the alchemist connected the body-soul-spirit relationship with the triadic formula. Soul penetrated body like the more active of the two chemical substances in an experiment of alchemic change; it brought about the existence of a third and higher substance, *pneuma*, which put the body-soul mixture into a new and active relationship to the cosmos. In short, human life was a perpetual alchemic process by which the dynamic body-soul union sparked off the vital link with the various fields of force surrounding the individual. The problem for the alchemist was to grasp the full nature of the life-process as revealed in himself and in all men, and then to apply and realise its pattern in other fields.

There are two further points. First, we may note the similar notion of *pneuma* and souls in the passage from the *Kore Kosmou* quoted in our first chapter, where, in an idiom better suited to a philosophy of process, we meet the view of the soul-stuff or rather soul-activity, *psychosis*, as produced chemically (that is, by a transformative process) out of the universal forces or *pneumata*. Since the *psychai* are individual souls, the assumption is that they link body and *pneuma*. Secondly, the Ostanes-passage states water and fire as the primitive elements: a dualistic view that looks towards Iran and the mages. In another (Latin-Arab) text Ostanes

says that there are four elements, but "of these water and fire are the roots, *radices*. Earth and air are composed out of them." And he tells Maria, "Our water has our earth remaining in it. It is great, lucid and pure; for out of the thickening of water is earth created."[48]

Ostanes looks again at the shining plaque and finds that the second inscription is written in Persian. It runs:

> The Land of Misr [Egypt] is superior to all other cities and towns on account of the wisdom and knowledge of all things that God has bestowed on its inhabitants. However the folk of Misr, as well as those of the rest of the world, have need of the inhabitants of Persia and cannot succeed in any of their works without the aid they draw from this last country. Don't you see that all the philosophers who have devoted themselves to the Science have addressed themselves to persons of Persia whom they have adopted as brothers.

Then it goes on to give in detail a letter sent by someone asking the Persians to send a man able to translate a book that has been found. We shall find the same motive in the letters of Pibechios soon to be considered. The third inscription was in Indian. This claims in turn that the Hindus from earliest times have had the superiority over other men. The sun is nearer to them, hence "the vigour of nature in our land. If we had not need of Persia we'd be able to achieve the entire work with only what comes from our soil and our seas." A tale is added about a sage sending to India for the urine of a white elephant as sort of panacea. The rest of the inscriptions, we are told, were effaced by time, so we don't hear of the other four nationalities.

However, Ostanes' adventures were not yet over.

> While I was examining the part I hadn't managed to decipher in this plaque, I heard a strong voice crying out to me, "Man, get away from here before all the Gates are shut; for the moment of closure is come."
>
> Trembling all over and afraid it was too late to leave, I went out. When I had passed through all the gates, I met an old man of unparalleled beauty. "Approach," he told me, "man whose heart is thirsty for this science. I am going to make you understand many things that have seemed obscure to you, and explain what remains hidden."
>
> I approached the old man, who then took my hand and raised his own towards the heaven, swearing by the God of the Heaven that I possessed the whole science and that all the secrets of wisdom were in me. I praised God who had showed me all that and who had made all the science's secrets manifest to me.



> While I was in this state, the three-bodied animal, whose parts devoured one another, cried out in a strong voice, "All the science can be perfected only by me, and it is in me that is found the key of the science. He who wants to accomplish the work in its perfection, let him recognise my true power and he will lack nothing of what the philosophers have said about the work."
>
> Hearing these words, the old man said to me, "Man, go and find that animal, give him an intelligence in place of yours, a vital spirit in place of yours, a life in place of yours; then he'll submit to you and give you all you need."
>
> As I wondered how I could give anyone an intelligence in place of mine, a vital spirit in place of mine, an existence in place of mine, the old man said, "Take the body that is like your own, take from it what I have just told you, and hand it over to him."
>
> I did as the old man bade me, and I acquired then the whole science, as complete as that described by Hermes.

We see that the alchemist has to be able to identify himself with the triadic beast, the formula of transformation or development. He must realise the unity of man and nature—not as a general idea, but by a concentration of his entire mind, body, and spirit on the work he is doing, so that he truly feels himself disintegrating, torn apart and put together, reborn in a new form. This identification of the scientist-artisan with the processes he is producing, is perhaps the hardest aspect of alchemy for anyone nowadays to understand or enter into. To men in whom the alienation of the intellect from the world of nature has been carried very much further than among classical Greek thinkers, the whole thing seems fantastic and overstressed, unreal. But in fact it was passionately real, and in my opinion it held an element of truth which we must strive to grasp and recapture if our science is to measure up to the full demands of reality. Of this point I shall have more to say later.

Who was the old man? It has been suggested that he was Agathodaimon, of whom we shall hear more later; but the reference to Hermes (Trismegistos) at the end makes it more likely that he was Hermes himself. In that case the guide at the beginning of the vision must be someone else. The vision is an odd document which on the whole inclines towards making the Persians the true centre of alchemic lore, yet shows traces of a version in which homage was paid to Egypt and its great seer Hermes-Thoth.[49]

The link of Ostanes with Demokritos and with Egypt is again

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brought out in the *Shawahid* of Ar-Razi, which quotes Apollonios of Tyana as saying that when Demokritos accompanied Ostanes to Egypt they found alchemy there to be based on the theory of Hermes that it all proceeds from the One Thing. The Egyptians were using as their main material Pigbrain on account of its likeness to the human brain. The visitors held that eggs had the same essential nature as brains and produced the same results; and the Egyptian sages accepted this viewpoint despite the difficulties in the alchemical manipulation of eggs. The resulting aphorism ("He who acquires the Philosopher's Egg must succeed, for it is the Tincture and is found in every house") seems based on the Hermetic theory, though Hermes had laid down that only substances of mineral origin were to be used in experiments; nothing organic. Ar-Razi commented that by the Philosopher's Egg the Hair was meant, and that, as eggs could be got at a trifling price, the saying of Demokritos (about a Stone that is not a Stone) was confirmed. It has been suggested that the use of eggs by Demokritos–Ostanes implied a school which had discovered the chemical activity of Sal-Ammoniac, a reagent that could be made by the distillation of organic substances and would thus suggest the use of such substances in place of minerals in alchemy. More of this later.[50] Before we pass on, we may look at another passage in the MS which holds the *Twelve Chapters*, which throws further light on the account of Ostanes' initiation. (The initiation-rite of the alchemist, we must remember, was a symbolising of the alchemic process itself.) The manuscript is fragmentary.

I adjure you, in the name of the immortal gods and in the name of the God of gods, by the power . . . unfathomable in itself, that warms by its fire, that turns and circles before the figure of the ineffable image.

It is not to the son nor to the brother . . . nor to the false friend nor to the [faithless] confident of the secret that one should reveal . . . these books I have written for the love of God: above all that who gold and silver. You must know also this: I have prayed the immortal gods not to let my words penetrate the ears of the foolish. As for adepts [who have betrayed the] mystery, they must not even see one of my books . . . Do not be mad enough to dare to claim the transmission of the tradition to them, for the book is guarded by God . . . [It treats] of the art and its operations, but the art . . . to God who . . .

. . . thus it has been offered to him [who deserves it]. His master gives it to him and makes him know . . . Thus you are very happy . . . it is reserved for those worthy . . . The art is not given to every man . . .



He pointed out the road with his staff . . . He questioned me and wanted to learn where I claimed to be going. I persuaded him to be my master and direct me in the way that leads to the hidden treasures. He understood my secret desire . . . He took thus and pointed with his staff . . . I persuaded him to be my master and direct me in the way that leads [to the hidden treasures]. He understood my wish, but he feared the immortal gods and did not wish to travel with me . . . I promised . . . that I'd give him the double . . . we arrived thus at the hidden treasures. He made me a sign with his hand [to offer] on my part the sacrifice that the gods demand. I carried out his desire and gave soul for soul and body for body. But even so there was no agreement as to holding up the fast—and I lost my life . . . Then I stayed 40 [days] . . . A second god opened for me [the dwelling place of] the sages, covered with a mound of herbs and dew, clothing of body and soul. I knocked after having stayed 4 times 40 days before each door. Then I went in through the door . . . after having offered many and suitable gifts. . . .[51]

This passage, multilated as it is, helps to fill out the picture of Ostanes' ordeals, which are here described as a death. The initiate surrenders his double, his other self. All sacrifice has an aspect of killing another creature so as to ensure one's own life; the victim is the image of the killer, who rescues his own life by offering up that of another. (This had its literal truth since the victim was in part eaten by the sacrificer, in part by the gods.) But this aspect came up more sharply and consciously in the Semitic world than anywhere else. The cuneiform tablets plainly state the idea of the victim as a substitute for someone threatened by death; Porphyrios attributes the same idea to the Carthaginians; and a series of dedications in Africa to Saturn (Baal) deal with the night-offering of a lamb, "soul for soul, blood for blood, life for life". In the African sacrifices it is uncertain whether the lamb takes the place of a child, who had previously been sacrificed, or whether it is merely a question of a substitute of lamb for sacrificer.[52] The whole concept of the redemption of worshipper by a dying god represents the system on a higher level, especially when the god is imaged in animal form (Dionysos as bull, Christ as lamb) and is eaten in some direct or symbolic meal of communion. Here the self-sacrifice of the initiate takes up the redemption-theme but applies it to the death-rebirth of the metals, which is also the death-rebirth of the alchemist. "The double" is a strange phrase. Perhaps it means that the initiate offers up his previous self, which otherwise would hang on and accompany the new self; perhaps it means that the metals, realised in their

alchemic values, become a second self, which the initiate offers up by driving them through the triadic process of qualitative change. In any event the initiate is assumed to reach a new unity of self, in which all his facilities, thoughts, and emotions are concentrated on, and dedicated to, the Great Work.

Finally we may note the Syriac texts of letters supposed to have been exchanged between Pebechios and Osron, a Persian, which fill out what the plaque-inscription said about requests for translations from Persian wise-men, and which thus seem part of the propaganda on behalf of Persia as the great source of alchemic lore.

Pebechios, humblest of philosophers to Osron, greeting. I have found in Egypt the divine and hidden Books of Ostanes, written in Persian script, and I cannot make them out. I beg you then to judge me worthy of your grace and send me the Persian Letters so that I may decipher the hidden words set down in these books. For I have a great passion and a lively desire to gain this knowledge.

I ask then the favour of being rated worthy to receive without jealousy this man's doctrine, who possessed the spirit of God, so that I can copy the writings composed in Egypt and reveal those composed in Persian. I ask for those Letters to be sent to me so as to be made available to all the world. As soon as I have succeeded in explaining these books, I'll send you back again the tablet that I'm asking of you. Answer quickly before death [?word effaced] comes on me.[53]

Osron, "the humblest of the mages," sends his reply:

When I got your letters I felt a great joy and I received a great honour since you judged me worthy of being singled out from among the mages my colleagues. [He sends on the requested Letters and begs to be sent the revelation.] For old age has seized on me and I fear that the weakening of intellect which is a malady of the spirit is coming on me; or rather indeed an attack that may bring disorder on my spirit and I may cease from being worthy of the divine spirit. I salute you all, copyists of the Divine Books of Ostanes, and above all [? word lost] you, the chief. Pebechios, as well as those who receive your teaching.

Pebechios answers, after many compliments:

I have opened the book and have found there the whole art of astrology, astronomy, philosophy, philology [fine literature], magism, mysteries and sacrifices; finally, that art so dreaded by many persons and so necessary, that of working gold. This art was written down [words



lost]. All this book was under the protection of God's name; and the whole book treated of minerals, purples, and divine tinctures of precious stones. I have transcribed it by means [word lost?] of Egyptian and Greek writings , and I have thus rendered it clear for all the world. I have transcribed the Seven Scriptures such as I have found them.

I have found a divine book, more precious than all the others. With justice the divine Ostanes called it *The Crown*; for it is the Crown of all the Gods, the Master of Books. It has been named Sun [Gold] and nothing is more excellent, except God. In transcribing, in reading, and in acquiring the earthly [virtues ?] embedded among the things written, I was astounded to find words free of all envy; to see how complete they were, how rational and pure; how Ostanes was animated with God's spirit, he who, bring a universal writer and a doctor, did not disdain the role of disciple, although all these sciences in reality came from him [word lost ?].

As for me I have forced myself to write according to his doctrine. My soul has got the profit, but my body is worn out with the labour needed to make the divine words emerge from this gift put at our disposal.

Note the lack-of-jealousy motive again. Pebechios (hawk) was a common Egyptian name; but our Pebechios here is no doubt the man who appears in the alchemic lists and in a magic papyrus.[54] The division of the material (minerals, purples, stone-tinctures) suggests the *Physika and Mystika*. The theme of a Persian book done into Greek appears again in the *Letter of Demokritos to Leukippos*, where also the invention of alchemy is attributed to the Kings of Egypt.[55] The Seven Scriptures, we saw, was a Zoroastrian motive—do we see the popularity of this number in such a context, in the name *Septuagint* or *Seventy* given to the version of the Hebrew Bible made at Alexandreia, though the story actually ran that six elders were sent from each of the twelve tribes of Israel, that is, seventy-two men, who worked for seventy-two days?[56]

Next comes a fragmentary passage where Osron speaks of 365 sections of some work, which perhaps Hermes confided to the Kings of Egypt and on which his disciples wrote commentaries. In these latter they explained the 365 days of the year "plus the extra day added to complete time".

They explained what was written on the priestly *stēlai* of Hermes, on each of these *stēlai*. They read there the six days and showed the true art to the King. The King, after rejoicing at the fulfilment of his desire and giving thanks, constructed secret places in Egypt. He inscribed the

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divine and unutterable art of Seven tables [or *stelai*] as much with his own hand as with those of the philosophers; then he placed them in the secret place. He set at the end of this place Seven Gates: a gate of lead, a gate of electrum, a gate of iron. For the Sun that lights up the universe he established a gate of gold; for Kronos [read Aphrodite], a gate of copper; for Hermes, a gate of tin; and for the Moon, a gate of silver.

[Marginal note] In a manuscript we have found: a gate of lead which is Kronos; a gate of electron which is an alloy, which is Zeus; a gate of iron, which is Ares; a gate of gold, which is the Sun; a gate of copper, which is Aphrodite; a gate of tin, which is Hermes; and a gate of silver, which is the Moon.

Here once again we have the seven steps, the seven planets, though the metals do not correspond exactly with the Mithraic system. But there was often a divergence in particular links. A Paris MS says, for instance, "Zeus, tin; the Persians do not say this, but *diargyros* [in Hebrew letters]; Hermes . . . mercury [*hydrargyros*]; The Persians [say] tin."[57] The margin-writer has sought to fill the gaps in our text, which goes on mention the initiation-beast, this time in the form of a drawing:

With all the lustre and force (two lines lost) . . . he drew a dragon eating its tail [the ouroboros] . . . images and artworks of a symbolic character . . . He advised against opening the door of the secrets to anyone not of good birth, anyone uninstructed; but thought it right to keep the divine mysteries for the master's adepts. It was thus the priests sealed all the mysteries; then each of them went home to his own land.[58]

"Of good birth" presumably means: born of the families to whom the lore was restricted. We may compare the statement in the *Koiranides*: "Hermes the Thricegreat God took the gift which he handed on to all men of mind (*noetikoi*). Do not hand it on to men without right feeling (*agnōmōnes*, senseless)."[59]

What then do we make of Ostanes as an historical figure, the teacher of Bolos-Demokritos? He certainly stands for the Iranian or magian tradition of alchemy, and yet we find him located in Egypt. He comes there with Demokritos, or he is working there. His deepest secret, the triadic formula, is found hidden in an Egyptian holy-of-holies. One list of names calls him an initiate of Egypt. Demokritos finds his secret, and Pebechios writes to Persia for the clues to translate his books. His letter to Petasios, however, clearly gives Asia Minor, the regions where the mages were thickly settled, as the provenance of the writer.



When we consider how strong is the magian tradition in the alchemic and botanical lore attributed to him, we feel that these regions of Asia Minor were the most likely source of his doctrines. His Persian line is stressed by Zosimos, who says that his master was Sophar the Persian, and who calls Ostanes himself a Mede.[60] As it seems possible that Ostanes was a name borne by many mages, perhaps a traditional magian name or title, there is no reason why an Ostanes may not have been the author of the works that went under his name. That the library at Alexandreia under the Ptolemies acquired large numbers of magian books, presumably many of them from Asia Minor or from more inland areas such as that of Harran, is attested by the peripatetic philosopher Hermippos. He says that it had many works ascribed to Zoroaster, probably at least 800 rolls (2,000,000 lines); and in addition there would have been many Greek works dealing with magian doctrines.[61] It would seem than in the 3rd and 2nd centuries B.C. at Alexandreia there went on a considerable fusion of Greek and Iranian thought. This fusion was expressed by bringing together the two great figures of Zoroaster the Persian and Hermes-Thoth the Egyptian in a large new corpus of magical recipes and ideas, above all in an endless series of pantheist correspondences between men, animals, plants, stones, stars and planets. We have seen how Hermes-Thoth haunts the initiation passage-rite of Ostanes, who played his part in the fusion of the two cultures as a lesser figure than Zoroaster, but one who loomed larger in the alchemic field. By about A.D. 300, Zosimos the alchemist saw a conflict between the positions of Zoroaster and Hermes, but this was no doubt the result of the increasing pressure of the problem of astrology which seemed to tie all lives down in a rigid determinism. Zoroaster, he said, agreed with Hermes that men could raise themselves above fatality, but he took the way of magic; Hermes on the other hand took the way of self-knowledge.[62] But around 200 B.C. this issue of freewill against determinism had not yet matured and there must have been many harmonious minglings of Graeco-Egyptian and Asianic-Syrian ideas, especially in the field of sympathies and correspondences of one thing with another. Stoicism with its concept of *pneuma* was to preside ultimately over such cultural developments.

This seems the period and the intellectual climate best suited for the linking of Ostanes and Bolos-Demokritos. The tensions which later brought about rivalries between the different schools

are quieted, and no national jealousies are aroused by the linking of Ostanes and Demokritos or by the location of the great secret in Egyptian shrines. Demokritos, the Greek, who stands between Egyptian and Iranian, is ready to take over the magian emphasis on fire and on penetrative processes.

It is possible that Bolos dramatised the union of cultures by telling stories of Ostanes as a visitor or resident in Egypt and by linking him with Demokritos, the classical philosopher who had been recognised as the pathfinder, the pioneer, in searching for the magian doctrines for stimulation or illumination. It is possible that magian scholars, surrounded with much mysterious aura, had come to Egypt and discussed things with him, and that they used the name of Ostanes, as the name of one or more of them, or as the name of a revered master who had originated their doctrines. The nearest we can get to what seem the facts is to assume that around 200 B.C. the fusion of Iranian and Greek-Egyptian ideas in Bolos of Mendes brought about the legends of Demokritos collaborating with Ostanes—legends that no doubt took various forms, one of which we have in the story of the opening pillar and the triadic formula.

# 8

# Hermes Trismegistos

We have seen how Hermes appears in a shadowy way as the father of all knowledge, including alchemy. Psellos, echoing what seems a genuinely old tradition, states that he taught the science before Ostanes and Pebechios, and wrote a book on it named *Kleida* (which seems connected with the title *Kleis*, *Key*, given to several such works). He adds, "Anoubis alone interpreted [*i.e.* understood] his Seven Books, *Heptabiblon*, and not even he clearly."[1] Several mythical or divine persons of Egypt thus come up among the alchemists, Hermes-Thoth, Isis, Anoubis, Agathodaimon.

Hermes is a highly important figure, not only in alchemy, but in almost all the fields where revelation was involved—and as we have seen, those fields at this time covered a very large part of culture. The quest for the truth in a breaking-down society gained an ever-greater urgency, while in general losing faith in unaided human efforts. Not only in matters of religion but in those of almost any field of inquiry, whether astrology, alchemy, physiology, botany, iatromathematics (medicine linked with astrology), or even rhetoric, the seeker turned despairingly to the spiritworld. Thus Aristeides records that the god Asklepios advised him in dreams, not only about remedies for his illnesses, but also about procedures in rhetoric. The Jew who composed *The Wisdom of Solomon* probably lived in Alexandreia; he was strongly influenced by Greek Hellenistic thought; and he thus described what he owed to his God:

> In his hand are both we and our words; all understanding, and all acquaintance with divers crafts. For himself gave me an unerring knowledge of the things that are, to know the constitution of the world, and the operation of the elements; the beginning and end and middle of times, the alternations of the solstices and the change of seasons, the circuits of years and the positions of stars; the natures of living

creatures and the ragings of wild beasts, the violences of winds and the thoughts of men, the diversities of plants and the virtues of roots; all things that are either secret or manifest I learned . . .[2]

The old oracles had little or nothing to say on things that worried men apart from immediate practical matters; only the Klarian Apollo had had anything to reveal on the question of the divine essence, and the thaumaturge Julian forged documents in imitation. Men wanted a more direct form of contact, more personal and more complete.[3] It was their duty to start off on the quest for the revelation of reality:

There was indeed something worthy of contemplation and of emotional agitation, the beauty of the heavens with its representation of the god still unknown, the solemnity of night linked with a light weaker than the sun's, but still alive, and the other mysteries moving each in its turn across the sky, giving order and growth according to the motions and regulated periods of time by certain secret emissions [*aporrhoiai*] to the totality of things here below.

And so fear kept on always increasing, there were indescribable seekings. And as long as the artisan [*technites*] of the universe persisted in his denial, ignorance enwrapped the whole world. But when he had decided to reveal himself such as he is, he inspired in gods outbursts of love, and he spread more generously in their intelligences the light that he held in his breasts, so that they had first of all the desire to seek him out, then will to find him, then also the power of succeeding. (*Kore Kosmou*).[4]

The Hermetic writings give us the revelation of the supreme Mind or *Nous*, of Hermes-Thoth, or of a disciple of Hermes: Tat, Asklepios, Ammon. The frame, as we have seen, is often that of a dream.[5] Hermes is thus the great source of revelation:

Hermes saw the totality of things. Having seen, he understood. Having understood, he had the power to reveal and show. And indeed what he knew, he wrote down. What he wrote, he mostly hid away, keeping silence rather than speaking out, so that every generation on coming into the world had to seek out these things. (*K.K.*)[6]

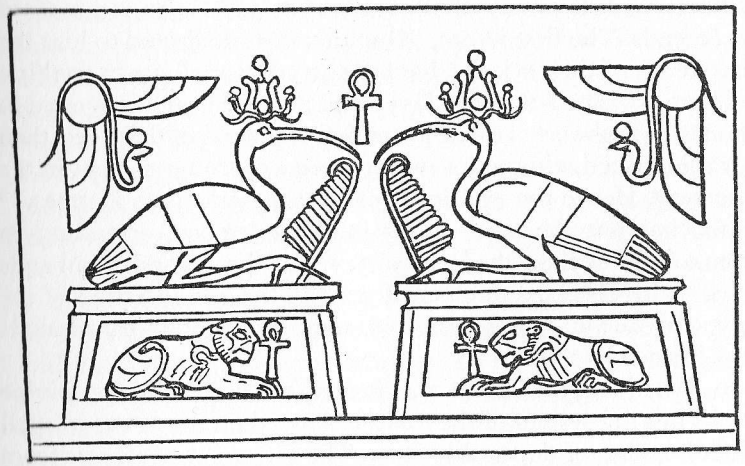
The term for writing down here is "engraved". He engraved his lore, we have seen, on *stelai* and tables. And so he was taken as the inventor of writing. Plato knew this tradition well.

Some god or divine man, who in the Egyptian legend is said to be Theuth, observing that the human voice was infinite, first distinguished



in the infinity a certain number of vowels, then the other letters which had sounds, but were not pure vowels [i.e. the semi-vowels]; these too exist in a definite number; and lastly he distinguished a third class of letters, which we now call mutes, without voice or sound, and divided these up, and likewise the two other classes of vowels and semi-vowels, into the individual sounds . . . [Finally] he assigned them all to a single art.

Sokrates also tells a story he heard at Naukratis about one of the ancient gods of Egypt, whose sacred bird was the ibis, Theuth. "He it was who invented numbers and arithmetic and geometry and astronomy, also draughts and dice, and, most important of all, letters." The king at that time, the god Thamos, lived at Thebes. Theuth came to him and showed his inventions. Thamos liked some and disapproved of others. When they came to letters, Theuth said it would make the Egyptians wiser, with better memories. Thamos replied that an inventor was not always the best judge of his inventions; as for letters, they would bring about the disuse of memories. "Men will trust themselves to the external written characters and not remember of themselves." Letters were "a *pharmakon* [drug, remedy, spell], not of memory, but of reminding; and you offer men the appearance of wisdom, not true wisdom. They will read many things without instruction, and will thus seem to know how many things, when they are mostly ignorant and tiresome company—not being wise but only



16. Thoth in Ibis-form with Shu and Tefnut as lions

have the show of it." At the end of Sokrates' parable, Phaidros says, "Yes, Sokrates, you can easily invent tales of Egypt or of any other country."[7]

Diodoros sets out the general Hellenistic view:

> According to them [the Egyptians], it was by Hermes that the common language of mankind was first further articulated and many objects still nameless got an appelation; that the alphabet was first invented and ordinances dealing with the honours and offerings due to the gods were properly established. He was the first also to observe the orderly arrangement of the stars and the harmony of musical sounds and their nature, to set up a wrestling school, and to give thought to the rhythmical movement of the human body and its proper development.
>
> He also made a lyre and gave it 3 strings, imitating the seasons of the year; for he adopted 3 tones, a high, a low, and a medium: the high from summer, the low from winter, and the medium from spring. The Greeks were also taught by him the expounding, *hermeneia*, of their thoughts, and for this reason he was named Hermes. In a word, Osiris, taking him for his priestly scribe, communicated with him on every matter and used his counsel above that of all others. The olive tree also, they assert, was his discovery, not Athena's as the Greeks say.[8]

The *Souda* says he was the discoverer of metals, especially gold, silver, and iron. No doubt this attribution came about through his place in alchemy. Tertullian for the Christians cited Hermes Trismegistos as the master of all who concern themselves with nature (scientists of any kind). Iamblichos and Galen rationalised the legends. The first wrote, "Our ancestors dedicated to him the discoveries of their science, having agreed to attribute everything to Hermes." The latter, "In Egypt, all that has been discovered in the arts was submitted to the general approbation of the sages; then it was inscribed without its author's name on columns kept in the sanctuary. Hence the multitude of works ascribed to Hermes."[9] Iambliches put the total of his books at 20,000, according to Seleukos, Manethōs made it 36,525. As the second number is divisible by 1461, the number of years in the Sothic period of the Egyptian calendar, it seems that some astronomic calculations have intruded.

In ancient Egypt Thoth was indeed the holder of the Divine Book; but the system of the gods was based on the governmental administration of the earthly State. The Pharaoh got reports from his ministers and officials; details of all administrative work were



carefully recorded in writing. So the Sungod, King of the World, needed a similar system. Thoth as his minister and scribe kept his Book of Government, not so much as a doomsbook or book-of-fate as a record of the practical side of the god's dominion.[10] Thoth sailed on the Sunboat of Re and had as title Great of Magic in the Ship of Millions; by his magic he defeated the Dragon Apepi that sought to swallow the Sun. One of his staffs had an eye through which the indwelling god could see.[11] By Graeco-Roman times Thoth as the highgod's scribe had turned into the supreme philosopher and natural scientist; and as we see from Diodoros, Re was in some respects supplanted by Osiris. Thoth's secrets were engraved and hidden away:

> At last he reached the clearcut decision to deposit the sacred symbols of the cosmic elements near secret objects of Osiris, then, after making as well a prayer and pronouncing such and such words, to return to the heavens . . .
>
> "There are those," said Hermes, "who will thoroughly know all the secrets of my writings and interpret them, and even if they retain some of them for themselves alone, others among them that are for mankind's benefit they'll engrave on *stēlai* and obelisks."[12]

Thoth thus had his beneficient aspects, which linked him with the art of healing. An Edfu narrative of the Birth of the Ogdoad (eight gods) tells of a shrine of his at Medinet Habu erected by Ptolemaios IX Euergetes II, where he was called Lord of Eshmunein and where a healing god Teos was also honoured. In this temple the deified sage Imhotep, identified by the Greeks with Asklepios, had a cult as well; and this fact has led to the conjecture that Teos, *Dhr*, was himself a deified priest of Memphis.[13] This *Dhr*, a *Sm*-priest, may have been the Theban Hermes whom Clement cited with Asklepios of Memphis as examples of deified men. But the epithet *stm*, a late form of *sm*, in inscriptions of the temple is used only for Thoth, not for Teos; it seems an epithet of Thoth as oracular god and healer.[14]

In any event there was a cult of Thoth at Thebes long before the Ptolemaic temple; in the New Kingdom he had been identified with the Theban moongod Khonsu. It would be natural enough for a human sage, Teos, if deified, to be honoured in the same shrine as Thoth, god of wisdom—just as we find Imhotep and Amenhotep, two more human sages, as shrine-sharers with the god. In linking Thoth with deified sages, Ptolemaios IX, who

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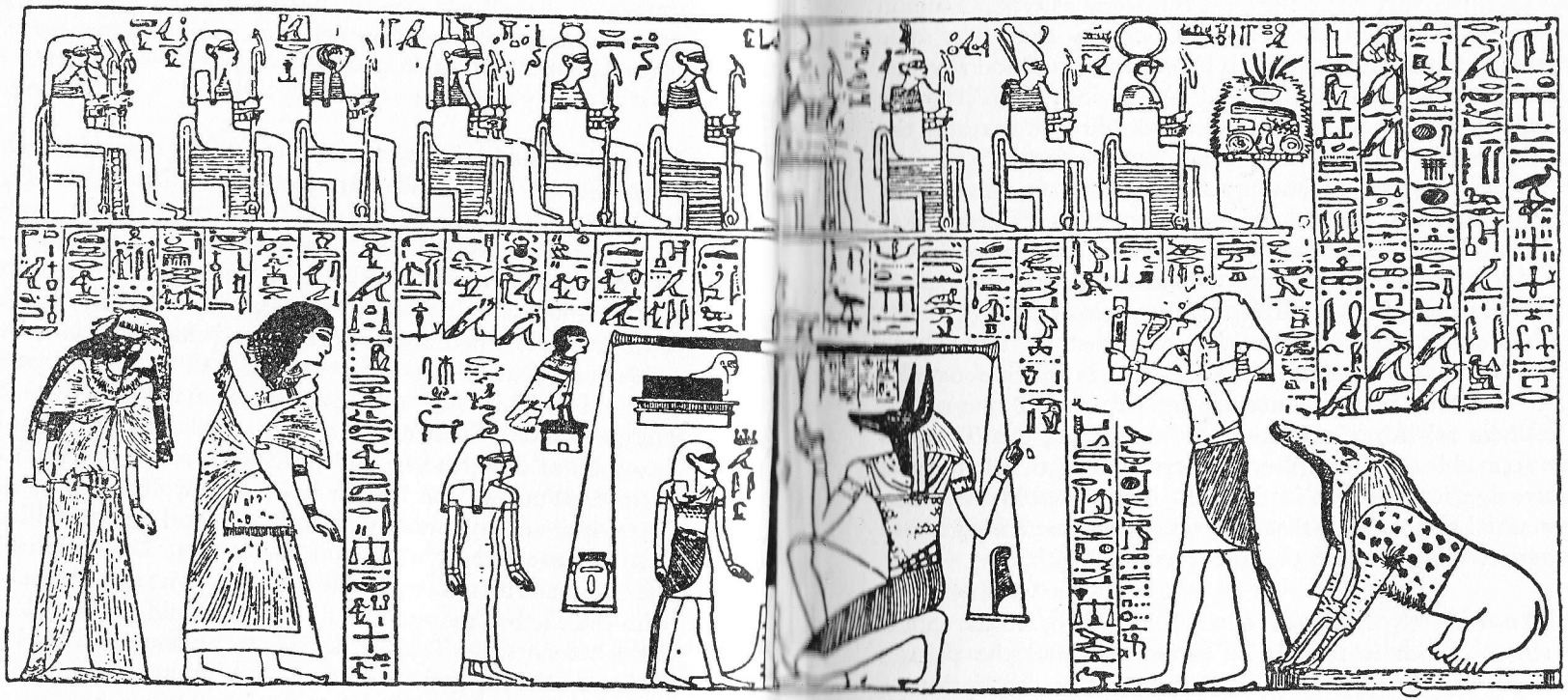
more than any other Ptolemy loved Egyptian lore, did not want to lessen his role; rather he wished to stress the connection with human wisdom. In the text of the shrine dedication, Thoth (or perhaps Teos) is said to descend every evening on the temple as an ibis and go forth in the morning. It seems then that here was a place of night-oracles through incubation. Perhaps the main worshippers were sick folk come to get advice from the god, who appeared in dreams. Thoth's epithet here, *Atm*, he-who-hears, would suit such a situation. [15]

The later function of Thoth-Hermes as the great revealer is perhaps linked with his role in a number of demotic appeals, which seem to be descendants of the ancient *Letters to the Dead.* We find them addressed both to him and to Imhotep. One, written on a jar, was posted at the grave of three persons (a man, a woman, and a second man who seems the son of the first). A



woman-attendant of the Ibises greets the trio by the name "before Thoth" and launches out in a complaint to the god about the seizure of her property by a man she names. Another appeal, on papyrus, of the Ptolemaic period, was written on behalf of a boy and a girl minor, complaining of their father's treatment of them after the mother's death and his remarriage. Another papyrus, also Ptolemaic, is a request by a son to be spared death through an illness; in return he promises, among other things, to pay a sum in monthly instalments for the burial of the ibises.[16] A fourth on a coarse-textured piece of linen (dated to the reign of Amasis or Dareios I) makes a wild complaint against someone not of this earth:

> Calamity O Thoth, Twice Great, Lord of Hermopolis! O Great Councils! O every god who is here! It happened to Esnekenbo son of Hor, whose mother is Hapertais, from the Hand of the Evil Daimon.



17. The weighing of the heart of Osiris Ani (the deadman Ani deified) by Anubis and Asten, with Thoth as register, and the great company of the gods of Heliopolis as witnesses

The master is the one who protects his servant who is maltreated. Protect me from it.

Our Great Lord, I am too old for the troubles in which I stand. He who is cast into the Justification [?] at an old age [?], those who [are dead] will be gracious to him and bring him in. Be gracious to me, O gods who are here. Propitiate for me the gods against whom I have committed wrongs and propitiate for me my Good Daimon. Cause them to be gracious to me. Save me from your destruction of wrong-doing.

Protect me from the Evil Daimon. Save me from it. Do not give me to the Evil Daimon. Take me to yourself. Do not give me to it. Save me from it from this day on. Do not let it come near a person of mine. Do not let it come near a possession of mine. Do not let another have power over me except you [Thoth].[17]

The term I have here translated as Evil Daimon appears in demotic horoscopes in application to the Sixth Hour and is given as *Kakē Tychē* in Greek, while the term translated as Good Daimon appears in the opposed Fifth House as *Agatha Tychē*. The same terms appear in the sentence: "It is in women that Good Fortune and Bad Fortune exist upon earth." Again in a fifth letter the suppliant has no human master to protext him; he has only the divine master Thoth; this man works at an ibis-farm.[18]

Thoth also appears in healing spells. Thus on the base of magically curative statue, where are eleven spells against snakes and scorpions, Thoth appears with a claim to avert poison from young Horos or from the patient, attributing to Horos the various parts of the latter's body with appropriate epithets.[19]

The importance of the appeal-letters is that we find Thoth coming down from his high remote position in the Sunboat and ready to listen to the most humble cries for aid. None of the afflicted here ask for a revelation of knowledge, but Thoth is seen as accessible to human pleas. Since he was supremely the god of knowledge, it was only a further step, though a bold one, when he was asked to share out that knowledge, at least among those who were striving to make themselves worthy of it.

The all-knowing revealer was Hermes Trismegistos. In the appeal cited above Thoth is the Twice Great. We find the phrase, *megistos* and *megistos*, Greatest and Greatest, on an inscription of the Greek titulary of Ptolemaios Philopator; and the hieroglypoc version also agrees in thus describing Thoth. The Rosetta Stone



has Great and Great, *megas* and *megas*. A papyrus with royal titles of Ptolemaios IV may have a triple *megistos* to fill a gap.[20] But the triple title certainly occurs on a Greek ostrakon from north Saqqara: "Greatest and Greatest God and Great Hermes". Two more ostraka are of interest, found in a small building to the west of a sloping dromos cut in limestone that led down to an entry into the catacombs of ibis-mummies. The building opened out of the hall from which the dromos ran down; it consisted of a cellar and niche appropriate to an oracular statue, and we may assume that a dream-oracle existed here. The date is fixed by the type of script and the reference to two Ptolemies, VI and VII, and Kleopatra II, with a joint reign lasting 170–64 B.C.[21] The writer is Horos, pastophoros of Isis "of the sanctuary in the city of Isis, Sebennyto". In one text we have the draft record of an oracle delivered to him by *megistos* and *megistos* god *megas Hermes*: then a new draft with some additions that mention "the rulers"; then the writer's own name and title; finally the god's triple title again. In another text Hermes is omitted; the form is that of a letter to the rulers about oracles and an obsure reference to what had been said: "[The army] of the Egyptians will be routed and the king is to advance into [or up to] the Thebaid." Clearly Horos was writing at the time of some disturbances mentioned in two fragments of Diodoros. First an Egyptian notable Dionysios Petosarapis had tried to cause trouble between the two reigning brothers in Alexandreia, failed, and retired to the suburb of Eleusis, where he gathered some 4,000 men. Defeated, he fled "to the Egyptians"—apparently to the *chōra* or countryside—where he organised further revolt. The second fragment tells of "another disturbance" in the Thebaid. There is no certainty that this one links with the first; but we hear that the king overran the Thebaid except for Panopolis, which the staunchest of the rebels fortified and which had to be taken by siege. After punishing the rebels, the king returned to Alexandreia. In our oracle it seems that Hermes-Thoth is on the side of the Ptolemies, at least to the extent of prophesying their victory. We see that Hermes could be appealed to for information as well as for aid.[22]

In ancient Egyptian texts the threefold repetition of a hieroglyphic expressed the plural.[23] The triple titles should then strictly mean only Hermes the Greatest; but they were taken as meaning Thrice-Great as is shown by the paraphrase Trismegistos. Magic papyri of the Hellenistic and later periods used as synonymous with

Trismegistos the surnames Trismegas, Trismegalos, and late texts expanded the names to Nine-Times-Greatest.[24] There was no connection with the designation of the pillared busts or Hermai as Trikephalos, Three-headed; such herms stood at the crossings of three roads—as the Four-headed stood at those of four. People who claimed to possess all the parts of philosophy or other fields of knowledge were jokingly given these names.[25]

In the later working-out of the place of Hermes in Egyptian thought he was divided into two persons. George Synkellos tells us of Manethōs:

> In the time of Ptolemaios Philadelphos he was styled Highpriest of the pagan temples of Egypt and wrote from inscriptions in the Seriadic Land [Egypt] which had been traced, he says, in sacred language and holy characters by Thoth the First Hermes and translated after the Flood into hieroglyphic. When the work had been arranged in Books by Agathodaimon, son of the Second Hermes [Trismegistos] and father of Tat, in the temple-shrines of Egypt, Manethos dedicated it to the above King Ptolemaios II Philadelphos in his *Book of Sothis*, using the following words:
>
> Letter of Manethos of Sebenntytos to Ptolemaios Philadelphos: To the Great King Ptolemaios Philadelphos Augustus: Greeting to my Lord Ptolemaios from Manethos Highpriest and Scribe of the sacred shrines of Egypt, born at Sebennytos and living at Heliopolis: it is my duty, Greatest King, to reflect on such matters as you may desire me to inquire into. So, as you are making researches about the Future of the Universe, in obedience to your command I shall set before you the Sacred Books which I have studied, written by your forefather Hermes Trismegistos. Farewell, I pray, my Lord King.[26]

This letter is not genuine Manethōs; Augustus was a title of the Roman emperors, not of the Ptolemaic kings. But Manethōs did in fact write a *History of Egypt*, of which we have fragments. As a Heliopolitan priest, he must have known the Sacred Tree in the great hall of the temple, where Seshat, the Lady of Letters, the Mistress of the Universe, wrote with her own hand the names and deeds of rulers. She was shown with Thoth and Atum making inscriptions on the leaves and fruits of the tree. We find Manethōs and Hermes linked in a list of medical writers in an MS of Celsus. The list includes Hermes Trismegistos, Manethōs, Queen Kleopatra, Nechepso.[27]

In the hermetic *Asklepios* Hermes refers to his grandfather Hermes; and Augustine wrote, "At the time when Moses was



born, Atlas is found to have lived, that great astrologer, brother of Prometheus, maternal grandfather of the elder Mercurius, whose grandson was that Trismegistus Mercurius.[28]

The Books of Thoth certainly existed in Hellenistic-Roman times, if not earlier, since Clement of Alexandreia gives us an elaborate account of a procession in which they were carried:

> The Singer is the one opening the march, bearing one of the attributes of music. He must know by heart two of the Books of Hermes: the first that contains the hymns to the gods, the second that sets out the rules of the royal life. After the singer comes forward the Astrologer who holds in his hand the clock and the palm, symbols of astronomy. He must know and have unceasingly on his lips the Books of Hermes treating of this science. These number four: one deals with the systems of stars that appear fixed; another on the meetings of the sun's and moon's light; the other two on their risings. In the third place comes the sacred Scribe with plumes on his head and in his hand a book and a rule, on which are set also the ink and reed he uses in writing. He in his turn is held to know what concerns the hieroglyphs, cosmography, geography, the course of the sun, moon, and seven planets, the chorography of Egypt and the description of the Nile. He should be able to recite the sacred instruments and decorations as well as the places destined for them, the measures, and generally all that belongs to the ceremonial.
>
> After these three persons comes on the one called the Master of Ceremonies, who holds a cubit, attribute of justice, and a cup for making libations. He must be instructed in all that concerns the cult of the gods and sacrifices. There are ten things that the cult of the gods and the whole Egyptian religion embraces: sacrifices, first fruits or offerings, hymns, prayers, processions, festivals, etc. etc. At last, to end the march comes the Prophet bearing the ewer, followed by those with the offered loaves. For the prophet is in addition charged among the Egyptians with the distribution of food. In his role of supreme pontiff he must know the ten books called sacerdotal. These deal with the laws, the gods, and all that relates to discipline.
>
> There are then forty-two Books of Hermes extremely necessary: thirty-six, which hold all the Egyptian philosophy, are carefully studied by those of whom we have just spoken. As for the six others, which deal with medicine and treat the body's constitution, maladies, instruments, eye-remedies, and finally remedies for women, they are the object of assiduous study by those who wear the cloak—that is, the doctors.[29]

Thoth was indeed at the head of the healing gods. The Egyptians were much concerned with the toxins created in the body by

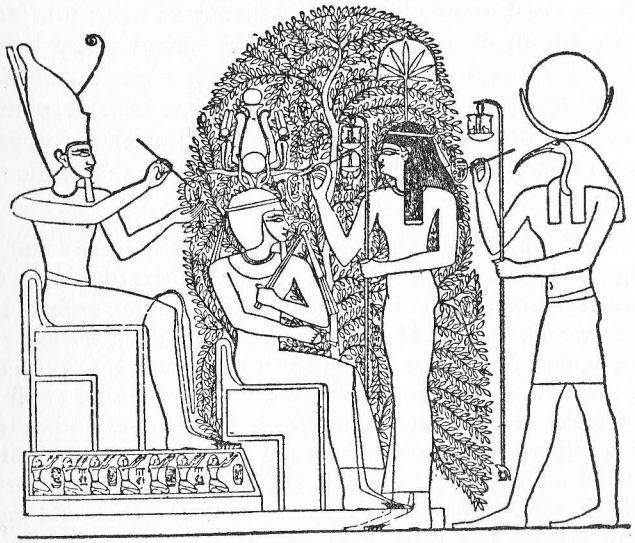
food-residues; and Thoth was said to have invented the enema—just as the ibis used its long curved beak, according to Plinius, to clean out that part of his gut from which residues had failed to get evacuated.[30] Horapollon speaks of a scribe distinguishing "between life and death" and of a holy book used by the scribes and called by them *Ambres*, "by means of which they decide the fate of a sick man lying down: whether he will live or not. This they judge from the position of the sick man." *Ambres* is obscure. An attempt has been made to link it with *im't-pr* as magical tricks rather than as house-utensil, or with the name of the magician cited by St Paul: "Now as Iannes and Iambres withstood Moses, so do these also resist the truth." Paul is here drawing on a Jewish apocrypha which goes back to Hellenistic times; Plinius puts Moses and Iannes on the same level, perhaps drawing on an anti-Jewish tract of Apion.[31] *Ambres* has however also been derived from an Egyptian term for word or sacred formula, so that perhaps the reference is to curative magic, a theme in the books carried by Clement's *pastophoroi*. This interpretation seems better than the linking of *Ambres* with a gloss of Hesychios: *ambrizein*, "to serve in the sanctuaries".

Thoth and Tat both appear in spells. Where the Greek sorcerer called on Apollo for presages, the Egyptian called on Tat, Boel, or the Moon. Thus an evocation with the aid of a lantern has the formula:

> Boel Boel Boel Boel I I I I A A A A Tat Tat Tat Tat you who spread the immense light, companion of fire, in whose mouth is an inextinguishable flame, great god who dwells in the fire, who are in the midst of the flames, in the celestial lake, between whose hands is the divine grandeur and the divine power, appear to this boy who has today my vase in his power so that he will reply to me truthfully, infallibly . . . Descend to the centre of this fire which is here before you, you who belong to Boel, to Aniel.[32]

We may note the stress on fire. Thoth through his connection with the Sunboat becomes a sort of guide for the magician. "Launch yourself on high to heavens and make the lofty Good-spirit sigh after the lofty mistress. Hasten to the eternal waters and make Thoth wish to voyage. Awaken the desire. . . ." Here the spell is of love.[33] Another formula for inspiring love in a woman's heart opens with Isis complaining to Thoth, called both baboon and grandfather, that she has found her sister Nephthys in copulation with their brother Osiris. The latter section uses the metaphor of metallurgy to bring about the sexual fusion of the lovers in the embrace:





18. Sekhait, Thoth, and Atum register a king's name on the Heavenly Tree, placing the king within it

> Belf, son of Belf, who has feet of copper, talons of iron, fixed with double nails of iron, who has . . . a head, alert feet, a knotted tongue and a light sword: bring it to me, tempered with the blood of Osiris, and put it in the hand of Isis . . . This mysterious fire . . . all fire, all nape-of-neck, all sigh, all plaint, all . . . that you forge in this stove of fire, breathe it also into the heart and the liver, into the loins and belly of N daughter of N. Lead her into the house of N son of N, and let her give to his hand what is in her hand, to his mouth what is in her mouth, to his body what is in her body, to his wand [penis] what is in her womb. Quick, quick, at once, at once.[34]

The metallurgical mystery here is very complex. The summoned spirit is made of metal; the sword he brings is tempered with Osiris' blood; it seems further forged in the fire of the spell, the fire of love, as in a stove, to enter into body of the beloved; and this magical thrust of the fire-sword becomes the entry of the lover into the girl's body.

In the spells Thoth is connected with the number seven. In a

charm, of Agathokles, for the procuring of a dream, we find: "Thoth, whom every god invokes, of whom every demon is afraid, and whose orders every angel obeys. Your name has Seven Vowels *aeēioyo iayoeēao oyeēoia*. I utter your famous name, name with constraining powers of every kind."[35] In another formula the magician thus addresses the sun in consecrating the magic ring of Hermes:

I am Thoth, inventor and initiator of magical means and magic writing. Come here to my place, you who are underearth, rise up for me, the greatest demon, Nun of the underworld, and you, gods of Nun of the underworld, for I am Heron, enjoying great glory, the ibis-eye, the falcon-eye, the phoenix-eye travelling across the airs, enveloped in mire and . . . skin . . . If I do not understand what is the soul of all Egyptians, Greeks, Syrians, and Ethiopians, and of every other tribe or nation whatever, if I don't understand the past and the future, if I understand nothing about their art and occupations, their works and way of life, their names and the names of their fathers and mothers, brothers, sisters, and dead, then I'll pour the blood of the black Kynokephalos [dog-headed, Anoubis] into my vase, without hurting myself, I'll put [the vase] on a new pedestal, I'll burn below it the bones of the Drowned One [Osiris] and at the port of Bousiris I'll cry [the name of] him who remained three days and three nights in the river [Osiris]; the Drowned one, who, carried on the river current, was cast into the sea and was enveloped by the waves of the sea and by the clouds of the air. His belly and all his body will be eaten by fishes, for I won't stop the fishes from eating him and they won't close their jaws.

I'll snatch [Horos] the orphan without father from his mother. The axis will be cast down and its two ends will come together.[36]

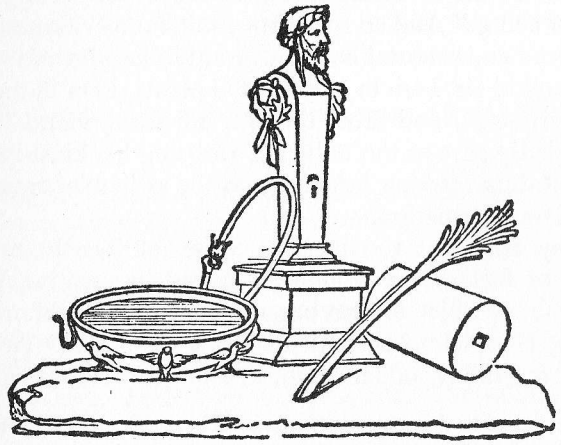
The last threat is to destroy the whole universe. We find it in ancient Egyptian spells directed against crocodiles, where the magician says:

I, I am the chosen of millions, who have come out of the Duat [underworld], whose name is not known. If my name were pronounced on the riverbank, the river would turn dry. If on the earth, the earth would take fire. I, I am Shu [god of air], image of Re, who am seated in the divine Eye of my father. If the inhabitant of the water opened his jaw or made movement with his claws, I'd whelm the earth in the abyss of water and the south would change to the north with all the world as well.[37]

The belief in Hermes as the revealer of nature's secrets and of the divine essence spread wide and lasted long. A strange pocket of



Hermetic beliefs, including much connected with alchemy, persisted among the Sabians of Harran in Mesopotamia. They survived as a pagan sect inside Islam, with Syriac as their ritual language, for at least two centuries, and turned out talismans, alembics, and astrolabes (needed to fix the times of the five daily prayers of the Moslems)—though many orthodox Moslem thinkers disliked magic, astrology, alchemy, as impugning Allah's omnipotence. In the 11th century their name was said to be derived



19. Herm in Dionysiac form with implements of worship

from Sab b. Idris, identified with Tat, son of Trismegistos.[38] (We saw above how among the Arabs Hermes was identified with Idris or Enoch, son of Adam.) The Sabian prophets were Hermes and Agathodaimon (Ahaydimon); and they seem to have had a very large collection of *Hermetika*, including documents now lost, at the time they adopted these works as their scriptures.[39] The linking of Hermes and Enoch may have come under Islam; in any event the Sabians raise a number of difficult problems we shall later consider. Here we may note that in the *Kitab al-uluf* the astrologer Abu Ma'shar (died 886) makes Hermes Adam's grandson. Adam taught him the hours of the day and night, and he, Enoch-Hermes, first spoke of "upper things such as the motion of the stars". He first built sanctuaries, developed medicine, and wrote many books on earthly and heavenly subjects. "He was the first to prophesy the coming of the Flood and he saw that heavenly plague by water and fire threatened the

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earth."[40] All this is connected with what was said earlier of Hermes and the Pyramids; and through such traditions it is possible that the Hermetic *Krater* or Bowl later on in medieval times developed into the Holy Graal. In *Hermes to Tat, The Krater or Monad* we are told that Hermes filled a great *krater* with *Nous*, Mind, and sent it down to earth. "And he has appointed a herald with orders to proclaim to the hearts of men: Plunge, you who can, into this bowl here, you who believe you will ascend towards him who has sent the bowl on to earth, you who know for what you have come into being." And so the reborn initiate of Hermes cries, "I have entered an immortal body . . . I am in heaven and on earth, in water and in air, I am in animals and plants, I am in the womb, not yet begotten, and after birth, I am everywhere." He has become vitally part of the universe, realising his kinship with all things and thus entering into them as the alchemist enters in the metals of transformation.

We may add that the creative voice of Thoth, under the influence of Hellenistic thought, became the creative Wisdom, *Sophia*, of God, which in turn became the *Logos*, Word or Reason, of Philon, Neoplatonists, and finally of Christians. Two hieroglyphic inscriptions, under Nero, at Dendera read as follows:

> Thoth the great and great, the most ancient, the master of the city Hermopolis the Great, the great god at Tentyris, the sovran god, creator of the Good, heart of Re, tongue of Atum, throat of the god whose name is hidden, lord of Time, king of the years, scribe of the annals of the Ennead. Revelation of the god of light Re, he who exists from the beginning, Thoth, he who rests on the truth. What springs from his heart has at once existence. What he utters subsists for eternity.[41]

Chemistry in medieval times was still called the Hermetic Science; but no Greek work under the name of Hermes has come down to us, though we hear of titles of his such as *The Work of the Sun*. We have only three fragments and various quotations by Zosimos, Stephanos, and others. However we can build up a fairly clear view of his doctrines. First, he is now and then linked with Demokritos. "Hermes and Demokritos are known according to the Catalogue to have spoken briefly of an Unique Tincture, and others allude to it." "Every sublimated vapour is a *pneuma* and such are the tincturing qualities; thus it is that the divine Demokritos speaks of the whitening and Hermes of the smoke."[42]



The main stress in his thought seems to be on the unitary nature of process.

> Others say that the Water is multicomplex, resulting as it does from two complex unities . . . just as the world is numerically one, though composed of multiple elements. Thus Hermes declares that the totality of things, though multiple, is called One. (The Christian.)
>
> This is the operation [*iosis*] of which Hermes speaks under the name: the Good with many names.
>
> For the truth of my remark I take Hermes to witness. He states: Go to Achab the labourer and learn that he who sews wheat makes wheat come to birth. [Zosimos.][43]

As a result Hermes saw man as a microcosm. Olympiodoros tells us:

> Hermes imagines man as a microcosm. All that the macrocosm contains, he also contains. The macrocosm contains creatures of earth and water; man has fleas, lice, and intestinal worms. The macrocosm has rivers, springs, seas; man has entrails. The macrocosm has creatures of the air; man has gnats. The macrocosm contains exhalations that burst out in its bosom, for example the winds; man has his flatulences. The macrocosm has sun and moon; man has two eyes, and the right eye is related to the sun, the left eye to the moon. The macrocosm has mountains and hills; man has bones. The macrocosm has the sky; and man has the head. The macrocosm has the twelve sky-signs; and man contains them too, from the head, *i.e.* the Ram, down to the feet, which are assimilated to the Fishes. There then is what they [the Hermetists] call the Cosmic Image [*mimēma*], as Zosimos notes in his book of *Virtue*.[44]

This system had been built up out of the mass of correspondences worked out in terms of the theory of Sympathy-Antipathy, especially through the merging of medicine and astrology. Firmicus Maternus in dealing with the offspring of the world—the position of the planets in the zodiacal signs at the beginning of things, informs us:

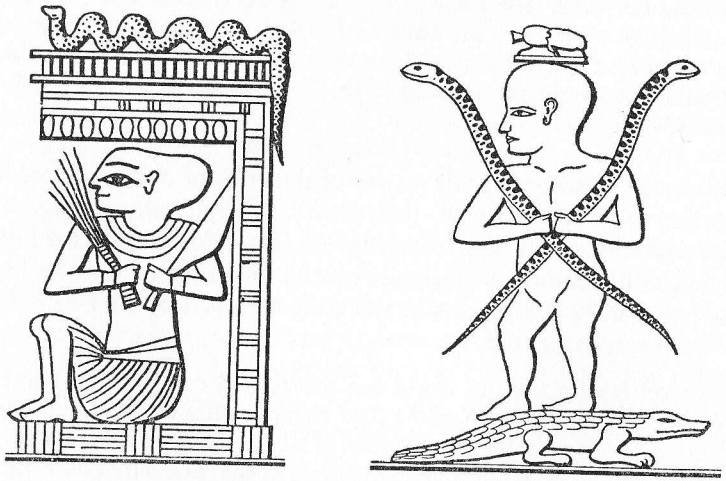
> The God fabricating the world has constituted man's body, like the world's, out of a mixture of the four elements, fire and water, air and earth, so that the happy combination of all these elements makes of the living a fine work according to the form of the divine model. And by the artifices of his creative art he has so made man up that under the constraint of nature there gathers in a small body [microcosm] every force and every substance in such a way that at the powerful celestial

breath that descends from the divine spirit to vivify the mortal body he prepares a dwelling, fragile indeed, but still resembling the world.

And that is why man, like a little world, is vivified by the flame and the eternal course of the five planets and the sun and moon, so that the living being created in the world's image may likewise be governed by the same substance of the divinity. Hence comes it that the two divine men who merit every admiration, Petosiris and Nechepso, whose wisdom has had access to the inner secrets of the divinity, have handed on to us, instructed as they were by a divine master of knowledge, the theme of the world in its birth-products to declare and prove that man, formed according to nature and the world's image, is sustained ceaselessly by the same principles that direct and sustain the world through the rays that warm it with a perpetual heat.[45]

The source of this declaration, he says, was "the Book of Asklepios called *Myriogenesis*"; and Asklepios together with Anubis, he mentions elsewhere, draw their lore from Hermes Trismegistos, "the divine master of knowledge".[46]

Hermes seeks to work our correspondences or interlinked forces of sympathy between various objects or materials. The effect of the phases of the moon on silver, for instance, or on magnesia, "which becomes lunar in its nature" Hermes held that all the materials were alive in some way or other. "Thus the



20. Ptah—as Guardian of one of the Arits of Osiris (Pap. of Ani); and as the magician's lord of primal and creative matter as well as of the great serpent-gods of Upper and Lower Egypt



active qualities [of the metallic bodies] take life under the action of heat and are chilled under the action of cold. Hence the metal is called a Living Animal, *zōyōn empsychon*, by the very speculative Hermes."[47]

The remarks on method show the notion of dynamic and dialectical process. "If you do not strip the bodies of bodies and if you do not give body to the bodiless, the expected result will be void." (Olympiodoros attributes this statement also to Maria the Jewess.)[48] It seems then that we can hand over to Hermes the aphorism linked with that just cited: "If the two do not become one, and the three one, and the totality of the composition one, the expected result will be void."[49] These ideas have a close affinity with those of Demokritos-Ostanes and Kleopatra; and it is hard indeed to say which writer has priority. Perhaps they all were drawing on early anonymous traditions. At any rate Zosimos looked to Hermes as the originator of the notion of the alchemic process as triadic:

> The present [chemical] composition, once set in movement, leaves the state of monad in order to constitute itself as a triad by driving out the mercury. Constituted as a monad that overflows as a triad, it is a continuum; but in return, constituted as a triad with three separated elements, it constitutes the world by the providence of the First Author, Cause and Demiurge of Creation, who henceforth is called Trismegistos in the sense that he has envisaged what he has produced, and what produces it, under a triadic mode.[50]

This important statement deepens the triadic concept by applying it directly to the moment of change, in which simultaneously there occur an act of union and an act of expulsion, of negation. This pattern is not a chance product, is not something that has only a limited application; it is the creative or formative pattern of all process. The alchemist is re-enacting the role of the demiurge.

A late commentator puts the matter in a less comprehensive form:

> The first of the chiefs of Goldmaking is Hermes, called Trismegistos, who has received this name, not only because the present operation is made according to three activities of the power, but because he observed that other operations than this are also made according to three distinct ontological essences. He it is then who has first written on the great mystery.[51]

Various operations were attributed to Hermes. As we would

expect from his concern with correspondences, he was interested in determining the right time for an experiment.

It is necessary also to examine the question of favourable times. The *pneuma* he [? Hermes] says, should be separated from the flower by the sun's action and maceration should continue up to the spring, and then, after that, at every favourable time, *pneuma* should be exposed to the fire, so that the gold may be good for using. Broad sunlight indeed, he says, produces that, since, he says, it's by the sun that everything is accomplished.

Listen to what Hermes says: that the softening of substances apt to grow softened is made by cold. He has explained himself at length on this point at the end of Whitening of Lead. He says there also on the subject of gold: "Thus in some sort operates he who prepares the All." He has treated there also on the way of sieving the All by any sort of sieve whatever. And Agathodaimon hasn't failed to note the point; for he names this operation Washing and Purification of the mineral when, pulverised and become liquid, the mineral passes through the sieve or filter. Hermes says: "It becomes like acacia-gum in drops." But of a sediment is produced, that's proof that neither the substances nor the mineral have been pulverised enough.

Hermes has himself expounded these matters at length in *Sieves*, when he repeats at the beginning and the end: "If the waters descend, the sieve itself seems to flow away". According to the great Hermes, the waters indeed descend all together, and then at once they remount through the utensil in which they seem to boil.[52]

The operation described in the first paragraph seems to consist of various treatments of a goldbearing mineral for the purpose of extracting the pure gold. The spirit, *pneuma*, would be the product of sublimation; it is then exposed to the winter-sun to separate it from the efflorescences or excretions; next to the action of salt (? natron), then to that of fire. The other paragraphs indicate recipes of the same sort. Lead-whitening would signify the passage from lead to silver. As for tinctures we are told:

Hermes has said in effect that by purple and by purple-coloured stone the ancients meant the rust of copper. Hermes, writing to Pauseris, said, "If you find the purple-coloured stone, know that it's indeed the thing [you seek]. You can find it, Pausēris, described in my *Little Key*." Hermes never composed a work on the tincture of stones or purple, but he wrote the *Little Key* on the composition of *komaris* according to the two formulas, so as to clarify the difficulty over the rust. In addition he was much taken up with quicklime.[53]



Hermes used many symbolic terms: choir-of-gold for *chrysokollos*; the Great God for the sun; midge-blood for red *kobathia*-shells; ray-of-honey for mercury; virgin's tail; cock-man and mole-man.[54] His love of the Sun appears:

The ancients had the habit of making sulphurous substances incombustible by means of a light fire and whitening materials. What the fire effects in an artificial way, the effects with the concourse of divine nature. And great Hermes says: "The sun which makes all things." And the same Hermes has not ceased from repeating everywhere, "Expose to the sun," and "dilute the vapour in the sunlight," and from one end to the other [*anō kai katō*] he mentions the sun. Everything is brought about in some sort by the action of solar fire, as we have already said. (Zosimos).[55]

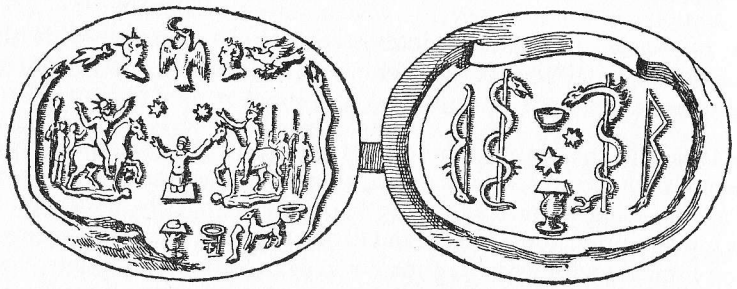
A reference by Zosimos interestingly links Hermes with the fantasies about Fallen Angels which we found earlier in Tertullian, the *Book of Enoch*, and the Hermetics.

It is said in the Holy Scriptures, woman, that there exists a race of demons who have commerce with women. Hermes mentions it in his *Physika*—indeed almost all the work, openly or covertly, deals with it. It is then related in the ancient and divine Scriptures that certain angels were smitten with women, came down from heaven, and taught them all the arts of nature. Because of this, says the Scripture, they offended God and dwelt outside heaven; for they had taught men all the wicked arts that have no utility for the soul.[56]

Hermes then seems to have known the *Book of Enoch*, as Zosimos does. This link would put the *Physika* of Hermes on to a date sometime in the 2nd century A.D.—unless there was an earlier tradition of the fallen angels teaching arts and crafts, which has been lost to us. St Paul evidently knew of tales about the angels coming down to copulate with women; otherwise there is no point in his rebuking the Corinthian women for praying or prophesying without covered heads. They should be shorn or covered, he says; woman was created for man. "For this cause ought the woman to have power on her head because of the angels."[57] No doubt he was thinking of *Genesis*, where we are told the sons of God saw that the daughters of men were fair, and they took "wives of all which they chose". But he would hardly have felt that this remote event was going to be re-enacted in Corinth unless there were more topical records of such goings-on. Still, the statement by Zosimos does make us feel that the

*Physika* passing under the name of Hermes could not be very ancient, especially as we are told that the theme of the fallen angels pervaded the work.

There is another angle from which we can approach the question of Hermes; that of the *Koiranides* which form a Bestiary with the animals studied in alphabetical order. The *Short Book of Hermes Trismegistos* is a work by a Byzantine editor, who had also brought together two versions of the *Kyranis*, that of Hermes and that of Harpokration. This Book deals also with plants and stones, as was normal in *Physika*, *e.g.* that of Bolos.[58] Further, the prologue of the *Kyranis*, in the two editions of Hermes and Harpokration, refers



21. Mithraic cameo: Mithras born from the rock between the dioscures, surrounded by various symbols, including the cup and bread of his eucharist; reverse two snakes twined on staff with drinking-bowl, stars, and altar between—note the two more stylised snakes on the outside with heads going the other way

to an earlier work, the *Archaic Book*. The connections here are with Syria rather than with Egypt; both the works of Hermes and Harpokration give a Syrian provenance. Thus Harpokration says the book had "come from Syria, from the region where the Euphrates flows," as also had the *Kyranis*. Both books he mentions as sunk in a Syrian lake.[59] In the *Kyranis* we read:

*Peewit*: a creature that flies in the air, called the peewit. It has a crest of seven colours, two-fingers-long, which stands up and comes down. It is itself of four colours, as in relation with the four seasons of the year. It is called *koukouphas* or *poupos*, as is written on the subject in the preceding work called the *Archaic Book*. The creature is sacred.[60]

There is another reference by Olympiodoros. In reading this passage we must remember that the alchemists used the term Man



for the Metal being treated. We hear of copper-man, asem-man and gold-man, and we shall later see the imagery at work in the vision of Zosimos. In one MS we see the metals and various substances represented as men and kings shut up in the phials where the operations are going on.[61]

And indeed as for the Man, we can dilute him and transmute him by projection, as said the Philosopher [Hermes] to Zosimos. He said in effect, "I have demonstrated that this living thing here is on the model of the cosmic living thing. And again in the *Pyramis* Hermes, making an enigmatic allusion to the living thing, said that the living thing is in the proper sense the essence of the *chrysokollē* and of silver. Hermes recounts in effect that the Man is the Cock cursed by the Sun. He tells that in the Archaic Book. He also mentions there the Mole. He says that the Mole also was once a Man, but came under God's curse for having revealed the mysteries of the Sun [Gold] and been made blind. And indeed, if it comes to be seen by the Sun, the earth does not receive it into its breast again until the evening. He says that it's because of having seen the form of the Sun [Gold] such as it was [or, the nature of Goldmaking]. And it has exiled the Mole into the black earth for having broken the rule and revealed the mystery to men.[62]

We also find a reference to Hermes' book in a treatise on the Peony: "It is called consecrated in the preceding book called *The Archaic Book*." The consecration of the flower was by attaching to it, with a thread of raw silk, a piece of the skin of seal which had also been consecrated at the moment of dissection: "as you have been told in *The Sacred Book*, in the chapter on dissections." Some stones (keramite, siderite, and beryllite) are also somehow used, and the plant is fumigated in a circle while two prayers are said; then it has its roots laid bare and is taken up.[63]

We meet the seal in other magic relations, as a prophylactic or a good-luck talisman. The cosmic blood in the following passage was made from the little black pismires found at the heart of a chrysanthemum.

Take then from a sea-seal the hairs between nostrils and jaw, a stone of green jasper, the heart and liver of a peewit, a radicle of peony or *glykysidē*, vervain seed, cosmic blood of the chrysanthemum, the point of a seal's heart, and again the crest on the peewit's head. Then you'll have a recipe more powerful than all those that have been given. After rolling the lot, with a little musk, in a balsam of four ingredients, put it in the skin of ichneumon or seal or young peacock or vulture, and carry it, being in a state of purity.[64]

We see then that these citations support the view of Hermes as a strong partisan of the unitary concept of the cosmos, with all things bound together with correspondences and sympathies. He seems close to Bolos. We cannot prove that his works were written before the 1st century A.D.; and so on the whole we may take his *Physika* and related works (which include the alchemic) as later than Bolos, the products of a general trend that Bolos seems largely to have initiated. But this does not mean that there were not works or aphorisms going under the name of Hermes much earlier.

We should expect the Egyptian approach to alchemy to be typified by the works attributed to Hermes, whether they had one author or several. If this were so, Hermes would be the figure set up to oppose Demokritos and Ostanes, and would stand for varnishing, tincturing methods as opposed to alloying. We have already noted the definite existence of two schools. A small work with the title *The True Book of Sophe* [Cheops] *the Egyptian and of the God of the Hebrews, Lord of the Powers, Sabaoth*, makes a plain statement of the opposing views. The corrupted text seems to date sometime after A.D. 300. The author is a supporter of the Egyptian way: he wants to obtain gold by means of a simple varnish that imitates the colour without alloying any parcel of the metal in question with common metal. He calls this way the Tincture of Demokritos: also the Tincture with the name of Monad, which yields the *komaris* of Skythia, that is, the red coloration drawn from the root of the *comarum palustre*. The other method, which he considers imperfect, consists of "making" gold by alloying a small quantity of gold with a large quantity of common metal. This way is the Tincture of Isis, "which Heron has made known". It corresponds to that set out by Hermes, which is also the way advocated by Isis: to multiply gold by gold, just as the farmer multiplies wheat by sowing the seed of wheat. (Why Heron appears in the matter is not clear. There was a god Heron in Ptolemaic Egypt, of a complex character. For our purposes here it is sufficient to see him as a form of Horos.)[65]

*The Book of Sophe* opens with a statement which directly connects alchemic process with the movement of the soul in salvation:

> The True Book of Sophe the Egyptian and of the God of the Hebrews, Lord of the Powers, Sabaoth—for there are two sciences and two wisdoms, that of the Egyptians and that of the Hebrews—is more solid than divine justice. Indeed this knowledge and wisdom of the most excellent things has issued from the depth of the ages. No master has produced it; it is autonomous. It is immaterial and seeks nothing from bodies plunged into matter and wholly perishable; for it operates without itself having to undergo itself any changes. Now you possess it as a free gift. In effect, for those who save and purify the divine soul enchained in the elements, or rather the divine *pneuma* mixed in the dough of the flesh, the symbol of *chēmeia* is drawn from worldmaking, *kosmopoiia*, by way of example, just as the sun, flower of fire, is celestial sun and right-hand eye of the cosmos, and as copper, if it becomes flower through purification, is an earthly sun, who is king on the earth as the sun is in the sky.



The touch about the sun as the right-hand eye of the cosmos is genuinely Egyptian. "The Egyptians compare the Sun to a King and to the Right Eye" (Sextus Empiricus); "The Sun rules the heart ... and the right-hand vision of man, the left hand of woman" (Porphyrios).

This high-flown language, important in showing how the alchemist saw himself as a demiurge recovering the secrets of creative process, suggests a late date (4th or 5th century A.D.) for the treatise; but the distinction it makes between the two schools certainly went far back. The Egyptian type of recipe appears in the following from *Physika and Mystika*, with its two powders of projection:

> Take mercury, fix it with the body [metal] of magnesia or with the body of stibium of Italy or with sulphur that has not passed through fire, or with aphroselinon, or with quicklime, or the alum of Melos, or arsenic, or as you like, and throw the white powder on the copper. Then you'll have copper that has lost its dark colour. Pour the red powder on the silver, you'll get gold. If it's on gold you throw it, then you'll have gold-coral embodied. Sandaric produces this yellow powder as well as well-prepared arzenic or cinnabar after it has been entirely changed. Mercury alone can remove the dark colour from copper. Nature triumphs over nature.

Still, can we apply at all easily the simple differentiation of the two schools to the various facts or statements of theory we have brought together in connection with Demokritos-Bolos and Hermes? The triadic formula of Ostanes, with its conception of a progressive state of order developed out of chaos, the primary black, could not have been devised out of purely tinctorial methods. It presupposes a genuine chemical series of changes, in which the whole nature of the fused substances undergoes

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qualitative shifts; it presupposes the use of fire as an active force, disintegrating and reintegrating the substances and their qualities. Again, both Demokritos-Bolos and Hermes insist on the unitary nature of process; both are profoundly affected by the sense of dynamic correspondences and interrelationships, which net the whole universe and provide a ceaseless and unbroken series of tensions, of fields of force.

However, there can be no doubt that the two lines of approach did exist at an early date and that they generated fierce controversies among the alchemists. But probably various convergences also began early, and the strict lines of demarcation began to break down. We may safely take the trio, Demokritos, Ostanes, and Hermes, to represent the fact that from the outset Greek, Egyptian and Iranian elements came together, in conflict and in amity, to bring about the basic concepts of alchemy and to develop the broad lines of technical approach. At root the conflict was one between the methods of metallurgy and those of the dyeing or colouring industries—though many other craft-processes (perfume-making, cooking, fermentation) contributed their quota of ideas and methods.

We may add two trifles connected with the name of Hermes. First, an *Organon* or *Instrument* for foretelling the issue of sickness according to a number applied in a certain way. A calculation was made, starting with the rise of Sirius in the month Epeiph, and was then referred to the table. The numbers ran from 1 to 34 in Greek, in a special order. A similar *Organon* was attributed to Demokritos; and we may compare the system with that mentioned by Horapollon for dealing with illness.[66] Secondly, under the names of Hermes and Agathodaimon we meet a commentary on a Riddle about the Stone: "I have 9 Letters and 4 Syllables, know me. The first 3 have 2 letters," and so on. This riddle is also found in the Sibylline Books; it fascinated the alchemists, is cited by Demokritos and Olympiodoros, and discussed by Stephanos. Various answers were arrived at: *Zōēs Bythos* (Abyss of Life), *Theos Soter* (Saviour God), *Anexphonos* (Voiceless), *Phaosphoros* (Light-bearing); and later on Cardan and Leibnitz took it to be *Arsenikon*. *Bythos*, by the way, was the fountain-source of life in Valentinian theology, throwing off a succession of emanations; sometimes it was given the name of *Charis*, Grace.[67]

We gain from the Arab alchemists many statements about



Hermes, some of which seem certainly of Greek origin. Most interesting is *The Emerald Table of Hermes*, a summary of alchemic thought, which exists in Arabic and in Latin versions.[68] It cannot be taken in any way as citing early works of Hermes, but it has its roots deep in Graeco-Roman alchemy, including that of Hermes. It is mentioned in an Arab work of the 8th century; and in the Latin text the Greek word *telesmus* is embedded. In one Latin version the translator tells us that the precious sentences of Hermes were found by Galienus Alfachim, or the Physician, on a plaque of emerald in a cave, which was clasped in the hands of the corpse of Hermes Trismegistos. The reader is exhorted to keep the text in strict secrecy from all but men of proved goodwill. Galienus is cited as saying, "When I entered into the cave I received from between the hands of Hermes the inscribed *Table of Zaradi*, on which I found these words." The name Galienus has been taken as Galen, but is seems a corruption of Balinas (Apollonios of Tyana). Emerald was a term given by Egyptians and Greeks to almost any green substance, not only the true beryl, but also green granite and perhaps green jasper. The emerald vessels of medieval times, however, were made of green glass, like the emerald table of the Gothic kings of Spain or the Sacro Catino of Genoa (a great dish taken by Crusaders at the sack of Caesarea in 1101, which was said to have been brought by Sheba to Solomon and used at the Last Supper.) The term *zaradi* seems as well to be a variant of a Persian word for an underground chamber.[69] Variants of the legend declared that the emerald slab with its precepts inscribed in Phoinikian characters was found in Hermes' Tomb by Alexander the Great; or that a woman Zara, at times indentified with Sarah, Abraham's wife, took the table from the hands of the dead Hermes in a cave near Hebron some ages after the Flood. The text had a great effect on Western medieval alchemy; its words were often endowed with talismanic force and engraved on laboratory walls or interspersed through writings:

> True it is, without falsehood, certain and most true.
>
> What is below is like what is above, and what is above is like what is below, for accomplishing the marvels of the One Thing.
>
> And as all things were from one thing, by the mediation of one thing, so all things were born of this one thing, by adaptation.
>
> Its father is the Sun, its mother is the Moon. The Wind carried it in its womb, its nurse is the Earth.

It is the father of all the Perfection of the whole world.
Its power is integral, if it be turned into Earth.
Separate the Earth from the Fire, the Subtle from the Gross, smoothly and with judgment.
It ascends from the Earth into the Heaven and again descends into the Earth and unites in itself the powers of things superior and things inferior. Thus you will receive the brightness of the whole world and all obscurity will fly far from you.
It is the strong fortitude of all fortitude, for it will overcome every subtle thing and penetrate every solid.
Thus was the world created.
Hence there will be marvellous adaptations of which this is the means.
Therefore am I called Hermes Trismegistus, having three parts of the wisdom of the whole world.
What I had to say about the operation of Sol is completed.

The *Table* thus states the doctrine of the unity of all things, the common origin of all forms of matter, the common soul or essence that is to be found underlying all the forms, the belief that all substances are the result of a developmental process and are thus capable of undergoing transformation. Sun, Moon, Wind, and Earth (gold, silver, sulphur, mercury) are seen as the sources of the Stone, as the main stages of change; and the remark about up-and-down movement suggests the *kerotakis* or later Vase-of-Hermes in which the Stone was held to be prepared.[70] (In medieval alchemy the most important vessel was called Aludel, Hermetic Vase, Vase of the Philosophers, Philosophers' Egg, and was shaped like an egg; sometimes it was shown with an enclosing serpent.)[71] We see then that the main elements of thought in the *Table* are in accord with the doctrines attributed in Greek MSS to Hermes.

There are also many citations from Hermes in Arab manuscripts; and some of these can be taken as carried over from the Greek with reasonable certainty. Thus, we know Hermes as a philosopher of the Microcosm; and Ibn Umail writes, "And so Hermes [Hurmus] named it [the Egg] Microcosm, from which and by which this thing of theirs is One. They called it Everything and they called it Every Body and Every Drug that is in the Hands of Men." Greek texts deal with the Parts of the Egg and show that attempts were made to assimilate or classify all the materials of alchemy as these parts. "One is All" is a basic Greek aphorism and is inscribed in the egg-shaped space of Kleopatra's *Goldmaking*.



Drug, *pharmakon*, was a common term for the preparation meant to colour metals.[72]

Again Ibn Umail writes:

Hermes said, "The thing agrees with the thing nearest to it in its Nature. Then a Child, like to them in appearance, is born from them."
Know too that the Humidity is from the influence of the Moon, and the Oiliness from the influence of the Sun; and consequently the Oil rises above the Water. The Element of all Heat is Oiliness, and the element of all Cold is Humidity. The thing that comes into existence from the subtlety of its Element, then becomes gross and strong and hard in proportion to the moderation of its Nature and in proportion to the strength which Allah—glorified and honourable is He—has granted to it. Some of it is immoveable and some moveable, and some is solid and some is liquid. This corresponds to the statement of the sage Aras to the King that the Water does not adhere save with that which has a similar sulphurous constituent in it, and nothing will be found in it of a similar sulphurous constituent except that from which it came into existence.
It is just like the words of Hermes: "The thing agrees with the thing nearest to it." He followed this with his words "in its Nature" and did not say "other than its Nature;" and this is manifest and clear from the words of Hermes. The Stone of the Sages is [produced] from it, and by it it is perfected.[73]

Here we have an echo of the Ostanes-formula about a nature rejoicing in a nature. What Ibn Umail is bringing out is that alchemic combination is not just the union of any two substances; the latter must have a living relationship to one another, a dialectical unity, before their coming-together can be productive of a qualitative change. We do not know in Greek MSS a reference to Oiliness as the Element of Heat; but in an Arabic treatise of *Hermes to his son Tat*, Hermes defines Oil, the Master of Water, as existing midway between Water and Fire, and asserts that through Oil or the Oils there is a close relationship between mercury, sulphur, and fire. "Just as the Fire is kindled in the Oil, so also is it kindled in the Sulphur." It is therefore quite likely that Greek theory did deal with the function of Oiliness.

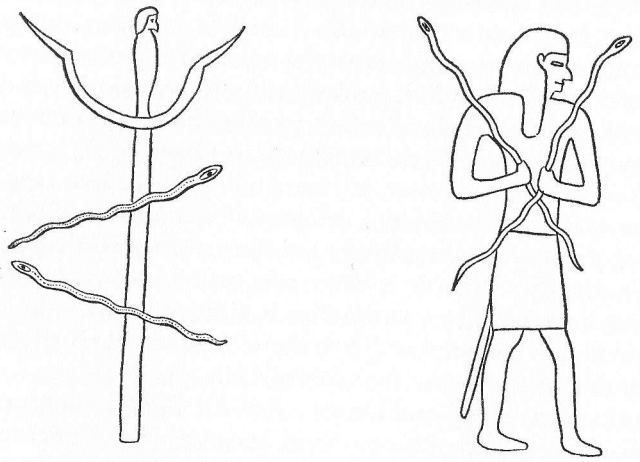
The notion of Up-and-Down, *Anō kai Katō*, is important in Greek alchemy: on the one hand because of the microcosmic image in which things below reflect things above or correspond with them, and on the other hand because in processes such as distillation and condensation the production of vapour and water

seemed to reflect the evaporation, mists, clouds, and rains seen at work in a circular movement between earth and sky. Ibn Umail says:

Regarding this Spiritual Water and the Sanctified and Thirsty Earth, Hermes the Great, crowned with the Glorious Wisdom and the Sublime Sciences, said, "Truth it is, indubitable, certain and correct that the High is from the Low and the Low is from the High. They bring about wonders through the One"—just as things are produced from that One Essence by a single preparation. Later, by his statement, "Its father is the Sun and its mother is the Moon," he meant their Male and their Female. They are the Two Birds that are linked in the pictures [I have] given of the beginning of the operation; and from them the Spiritual Tinctures are produced. And similarly they are at the end of the operation.

Later in his statement, "The Subtle is more honourable than the Gross," he means by the Subtle the Divine Spiritual Water; and by the Gross the Earthly Body. As for his later statement, "With gentleness and wisdom it will ascend from the Earth to the Sky, and will take fire from the Higher Lights," he means by this the Distillation and the raising of the Water into the Air.

As for his later statement, "It will descend to the Earth, containing the strength of the High and the Low," he means by this the breathing-in of the Air and the taking of the Spirit from it, and its subsequent elevation to the highest degree of heat, and it is the Fire; and the Low



22. Mummiform figures on staff with snakes undulating across and figure with two crossed snakes from the Book of the Underworld (tomb of Osorkon II at Tanis)



is the Body, and its content of the controlling earthly power which imparts the colours. For there lie in it those higher powers, as well as the earthly powers, which were submerged in it. The natural operation and decay causes it to be manifest, and hence the strength of the Earth, and of the Air, and of the Higher Fire, passed into it.

Later he said, "It will overcome the High and the Low, because in it is found the Light of Lights; and so the Darkness will flee from it."[74]

This is a commentary on the Emerald Table and brings out the significance of the movement up-and-down, down-and-up. The use of the term, the Raising of the Water, occurs in Greek as early as Demokritos-Bolos' *Physika and Mystika*; and the term Bird for a volatile substance is found in Zosimos.[75] Thus Ibn Umail remarks further on this point:

Aras in his discussion with Quisar, King of Rum, regarding this White, Clear, Red, Hidden Water, spoke as follows, "Hermes said, 'It is necessary to extract the Spirit with gentle fire because this Spirit, whose extraction must be carried out by a gentle fire like [the heat of] a brooding bird, is the Spirit that imparts Tinctures to the Natures and torments the Natures because its sulphur was [formerly] combustible, but now becomes incombustible and tinctures like the Tincture of Purple; and it is the Spirit of the Bodies because it is a Spirit that has been extracted.' "[76]

The Heat of the Brooding Bird is prescribed in the *Dialogue of Komarios and Kleopatra*. We may recall also how Hermes in Greek texts liked a slow and lengthy operation, and preferred the use of sun-heat.

Such quotations as these from Ibn Umail, which might be multiplied from his writings or from those of al-Razi and Maslama al-Majriti, show that there was among the Arabs a genuine literature of Hermes, translated from or closely connected with Greek works, as well as a large amount of treatises which merely used the name of the master to gain prestige. They do not add much to the picture given by the Greek passages, but help to convince us of the importance of the Hermetic side of the alchemic tradition.

Before, however, we pass on, it is of interest to note that the notion of up-and-down, down-and-up, as distinct from that of the lower world merely reflecting the upper, is to be found in ancient Egyptian thought. The caduceus of Hermes has prototypes that can be found in early eastern imagery, from India to Egypt.

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The rod or staff can be linked in a general way with the sacred Tree, Mountain, or Ded-pillar that are prominent in Egyptian mythology and ritual; and much light is cast on the inner meaning of these symbols by Indian ideas. There we find the idea of an invisible canal called *nādī* in Sanskrit (from *nāda*, movement). Various translations have been made of the term: subtle canals (tubes), luminous arteries, psychic canals or nerves. There were many *nadi*, but three chief ones: *Ida*, *Pingala*, and *Susumna*. The last-named, the most important, corresponded to the vertebral column, *Brahma-danda*: "the microcosm of the macrocosm." It was the great road for the movement of the spiritual forces of the body; and around it were twined, like the two snakes on Hermes' staff, the two other *nadi*, *Ida* on the left, female and passive, and *Pingala* on the right, male and active. On the top of *Susumna*, at a point corresponding to the top of the skull, shone the Sun. Along the central axis were located six main centres or *cakras* (circles, wheels, represented in the shamanist rituals of Central Asia by the six cuts made in the Tree before which the shaman falls in his possessed fit of initiation and which in turn represent the six heavens through which he ascends, with mimed episodes at each stage.) At the base of the spine, like a snake coiled in its spirals, sleeps *Kundalini*, the "igneous serpentine power", which awakens during the initiation and rises up, from base to top, through the various *cakras* till it reaches *Sahasrara*, located at the suture on the crown where the two parietal bones meet. This aperture, the *Brahme* (*Brahme-randhra*), is the place where "the Sun rises." The original text thus expresses the imagery: "The Bride [*Kundalini*] entering into the Royal Highway [the central nadi] and resting at certain spots [the six *cakras*] meets and embraces the Supreme Bridegroom and in the embrace makes springs of nectar gush out." A Brahmin of Malabar, speaking of the Dravidian caduceus, said, "The snakes that enlace represent the two currents that run, in opposite directions, along the spine."[77]

But can we definitely transport these notions into ancient Egypt? It seems that we can. Take such a representation as that from the tomb of Ramses VI of a staff on which stands a mummified figure; between him and the staff-top is a pair of horns, and wriggling across the staff, lower down, in opposite directions, are two snakes. The dead man, at the last Hour in the Book of the Underworld, leaves his mortal remains, sloughs them, and is reborn as the scarab Khepri. A stele sets out the idea: "Homage



to you, Mummy, that are perpetually rejuvenated and reborn." The horns on top of the staff are called *Wpt*, "summit of the skull, to open, divide separate"—that is, the parietal bones are thought of as opening to release the reborn dead-man. *Wpt* also means the Zenith of the Heaven. A figure in the tomb of Osorkon II at Tanis stands with a snake in each hand; the snakes criss-cross in their undulant movement, forming an X across the body. A symbol often cut on scarabs and scaraboids is that of the Ded-pillar with a snake hanging on either side, the heads going in opposite directions. The word *Imakh* (Blessed) in its ending and especially in its determinative is represented by the spinal column with an indication of the medulla; the ending also denotes the canal or channel of the spine of the snake through which the Sun passes—the Night Sun in the Underworld. So the one symbol brings together the ideas of Blessedness, Spine, Spinal Canal (of the Sun). The Sun emerging at the end of the snake staff is both the dead man reborn and the newborn Sun (Khepri); the dead man emerges from the spinal column at the top of the skull, and is reborn—the sun emerges from the spinal night-canal and is reborn; the dead man and the sun are one. We may add that *Sa*, which means the Back, the Spine, and which enters into the god name Besa, is homonymous with *Sa*, which means Protection. The determinate connected with *Imakh* appears also in *Pesedj*, which takes on the meaning of both Spine and Illumination—a meaning attested from the time of the Pyramid Texts. The root *Ima* of *Imakh* merges again with the homonymous Tree assimilated to the Ded-pillar and expressing the luminosity of the sun.[78]

We see, then, in ancient Egyptian thought a system closely analogous to that of India which we discussed. The individual spine and the world-pillar are identified; there is a concept of life-forces moving up and down this axis; the skull top is also the sky-zenith; the new birth of the life-force is one with the rising of the sun. The microcosm-macrocosm relationship is very close to what we find in alchemy, but with the latter the whole system operates on a new and higher level of philosophic and scientific thinking.

In Greek thought we do not find anything so precise as the systems in Sanskrit and Egyptian; but with the growth of ideas about the pervasive *pneuma* the notion of forces descending into the body and ascending out of it appears. Porphyrios cites an Oracle of Apollo:

> The stream separating from Phoibos' splendour on high
> and enveloped in the pure Air's sonorous breath
> falls enchanted by songs and by ineffable words
> about the Head of the blameless recipient:
> it fills the soft integument of the tender membranes,
> ascends through the Stomach and rises up again
> and produces a lovely song from the mortal pipe.

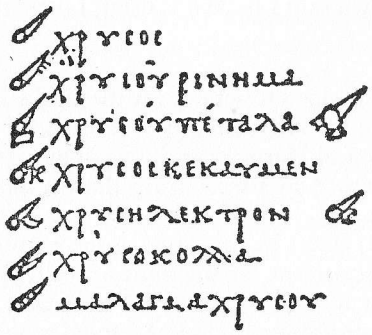
Porphyrios comments that the descending *pneuma* enters into the body, "and, using the soul as a base, gives out a sound through the mouth as through an instrument." We are reminded of the ecstatic noises of the Gnostics which were thought to echo the music of the spheres. The lovely song from the mortal *aulos* seems to go straight up to the celestial source of *pneuma* in the sun. The down-and-up, up-and-down pattern is completed.[79]

Perhaps a confused version of the ideas we saw associated with *Imakh*, *Sa*, *Pesedj*, appears in a magical intaglio of terracotta where we see a serpent twining round a star-topped staff; parallel with the staff rise an altar surmounted with a staff (starred at either end) on the right and a schematic human form standing on its head on the left. Here there seems depicted an up-and-down flow of forces. On a blue-flecked onyx a monstrous figure (with scarab-body, human legs, head of a maned animal) stands crowned, holding in each hand a staff round which a snake twines. One staff has a goat-head, the other a dog-head; and under the creature's feet is an Ouroboros enclosing a man, perhaps ithyphallic, and what seems a thunderbolt. The head of the Ouroboros is down at the bottom. The crown is made of a disk set on long horns and flanked with four uraei. There seem here defined two contrary motions: one of the scarab-sun (upwards to the large crown), and one of the cosmic serpent (downwards into the underworld of death). Interpretation of such obscure objects cannot but be doubtful, though there does seem a link with the complex of ideas and images we have discussed.[80] A passage in Hippolytos' account of the Peratai also reveals this complex in a slightly confused form. He is discussing an up-and-down movement. The Son, he says, brings down from above the paternal Signs and again carries aloft those Signs when they have been "roused from a dormant condition and made into paternal characteristics—substantial from unsubstantial being; transferring them hither from thence". The Son's cerebellum is "in the form of a Serpent", that is, a serpent-head, "and they allege that this, by an ineffable



and inscrutable process, attracts through the pineal gland the pneumatic and life-giving substance emanating from the vaulted chamber [? both the skull and the heavenly vault]. And on receiving this, the cerebellum in an ineffable way imparts the Idea, just as the Son does, to Matter; or, in other words, the seeds and genera of things produced according to the flesh flow along into the spinal marrow." Though the description is unclear, the idea of an up-and-down, down-and-up flow of pneuma is certainly present, as also that of an entry of divine force through the cerebellum into the spinal column. The Peratai thus interpreted the phrase, "I am the Door," in *John*.[81]

We may add that the idea of the staff of Hermes as a resolving or balancing power between two opposing principles (the snakes) appears in a tale, given by Hyginus, that Mercury saw two snakes fighting in Arcadia and put his staff between them, thus arresting the conflict; hence the caduceus as an emblem of peace.[82]



23. Combinations of signs to express modifications of gold

# 9

# Isis

Isis plays only a slight part in alchemic literature apart from one work, which we have in two versions. The opening mythological sections differ, but the more purely alchemic content is the same in both versions and has been taken to date closely to the main Demokritean texts. The title is *Isis the Prophetess to her Son Horos*, and the narrative deserves quotation in full. The two versions do not differ radically, but where it has seemed advisable to add a passage from the version I have not used, I have done so in square brackets.

You, my Son, you decided to set out for the battle with Typhon, so as to dispute with him the kingdom of your father. As for me, after your departure, I went off to Hormanouthi, where the Sacred Art of Egypt is practised in secret. And after staying there a long enough time, I wished to come back.

Well, when I was about to leave, one of the prophets or angels who dwell in the first firmament caught sight of me [by the permission of a favouring season and according to the necessary movement of the spheres]. He advanced towards me and wanted to mate with me in the intercourse of love.

[He was just about to do as he wanted] but I refused to yield. I demanded first from him that he should tell me of the preparation of gold and silver.

However he answered that he wasn't allowed to explain such matters, for this mystery went beyond every description. [But next day there'd come to me an angel, his superior, Amnael, and he would be powerful enough to reply to my question.]

Next day there came to me the first angel and prophet among them, by name Amnael, and once more I questioned him on the preparation of gold and silver.

He however exhibited a certain sign that he had on his head, and a vase that had not been coated with pitch, filled with transparent water, which he held between his hands. But he refused to tell me the truth.



Next day, having returned towards me, Amnael was seized with desire on my account and [unable to contain his impatience] he hastened to achieve the object for which he had come. But as for me, I deliberately took no notice [and did not ask him about those things].

He however did not stop from trying to win me over and to invite me to the business, but I refused to let him take me. I triumphed over his lust till he was ready to show me the sign on his head and reveal to me, generously and without hiding anything, the sought-for mysteries.

So he decided then to show me the sign and reveal the mysteries. He began by retailing the warnings and the oaths—and this is how he phrased it:

"I adjure you by heaven and earth, light and darkness. I adjure you by fire, water, air and earth. I adjure you by the height of the heaven and by the depth of the Tartaros. I adjure you by Hermes and Anubis, and by the roaring of the Serpent Ouroboros and of the Threeheaded Dog, Kerberos, guardian of Hades. I adjure you by the Ferry and by the Boatman who crosses Acheron. I adjure you by the Three Goddesses of Fate, by their Whips and by their Sword."

When he had made me swear by all these words, he went on to enjoin upon me that I must never communicate the revelation to anyone except you, my beloved and legitimate son [so that he might be you, and you, he].

So go then, my child, to a certain labourer [Achaab] and ask him what he has sown and what he has harvested, and you will learn from him that the man who sows wheat also harvests wheat, and the man who sows barley harvests also barley.

Now that you've heard this discourse, my child, learn to comprehend the whole fabrication, *demiourgia*, and generation of these things, and know that it is the condition of man to sow a man, of a lion to sow a lion, of a dog to sow a dog, and if it happens that one of these beings is produced against the order of nature, he has been engendered in the state of a monster and cannot subsist.

For a nature rejoices another nature, and a nature conquers another nature.

[So then, having shared in this divine power and been favoured with this divine presence, illuminated in turn as a result of Isis's demand] we must prepare the matter with the aid of minerals alone without using other substances [and attain our goal by the fact that matter added was of the same nature as that which was prepared]. Just as, I have told you, wheat engenders wheat, man engenders man, and similarly gold engenders gold.

See, there is the whole of the mystery.

Then, having taken some mercury . . .[1]

And recipes for operations follow.

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We find there, in truncated form, the triadic formula of Ostanes-Demokritos; but the main bias of the doctrine is towards Hermes with his insistence that like begets like. Further, Hermes used the parable of Achaab, a name we do not seem to meet in the Jewish tradition, though the general principle of like from like is found in *Jeremiah* (xii 13), *Proverbs* (xxii 8) and *Job* (iv 17). Olympiodoros tells us:

> And Zosimos says in the book *According to Energy*: "For the truth of my words. I take Hermes to witness. He declares: Go to Achaab the labourer and learn that he who sows wheat brings wheat to birth. Similarly I too have told you that substances are tinctured by substances as it is written: as to the tincturing, it is divided into two kinds, the bodily and the incorporeal. The Art limits itself to these two kinds.[2]

The formula "so that he may be you, and you, he", occurs in a magical papyrus and in a *Prophecy of Zoroaster* surviving in Syriac texts.[3] The latter deals with the prophecy by Zaradoust of the virgin-born saviour whose birth will be marked by a brilliant star. "He will rise up from my family and my line. I am he and he is I, I am in him and he is in me." Zarathustra is defining the saviour, Saoshyant, as his avatar; he has himself received in the *Avesta* the title Saoshyant that is to mark the world-renewer.[4] In our text it seems then that Horos is in some sort an incarnation of Amnael—unless all the true practitioners of the art are from one aspect spiritually identified with one another. Just as the devotee of a mystery-religion might seek to become the god, the bacchant to become a *bacchos*, so the true alchemic seeker became Hermes, Ostanes, Demokritos, or whomever he took to be the divine founder of his art. He became, in fact, the Alchemic Man. We may note that in the Syriac prophecy cited above the saviour is described: "You, my Son, you the seed of life, issue of the treasure [or storehouse] of light and of spirit, that has been sown in the soil of fire and water." This Iranian imagery would serve very well as a description of the vital seed, the egg or the divine water, of alchemy.

The name Amnael does not appear in the *Book of Enoch* or in Synkellos. It means: *El-has-declared*. Perhaps it appeared in some Egyptian version of the Fallen Angels who teach the crafts to men. Attempts have been made to identify the angel here with Hermes. Also with Agathodaimon and with the Egyptian god Psais, who could be called Heron in Greek. As Isis seems to belong to the



school of Hermes, it would be most plausible to take Amnael as Hermes, the original revealer of her kind of doctrine.[5] There is also a tradition making Isis the daughter of Thoth. Ploutarch states:

> Many have made her out to be the daughter of Hermes; many others, of Prometheus, whom they hold to be the inventor of wisdom and foreknowledge, while Hermes invented grammar and music. So, of the Muses at Hermopolis [Hermes' Town] they call the foremost one Isis and Justice-Wisdom. And they show the divine mysteries to such as are truly and rightfully styled Carriers-of-sacred-things and Wearers-of-sacred-robes: these are those that carry in the soul, as it were in a copper, the sacred stories of the gods that cleanses the recipient from all superstition and magical follies. . . .[6]

Here we find Isis and her mysteries connected with the temple of Hermes; and we may note the odd metaphor of the soul as a copper in which are put the genuine myths that have a cleansing effect—apparently by boiling or some such process. The magical papyri show Thoth-Hermes aiding Isis with his counsel to find her brother Osiris. Diodoros cites from his supposed *stēlē*, "I am Isis, Queen of every land, she who was instructed by Hermes . . . The aretologies use the same opening, "I am Isis, the mistress of every land. I was taught by Hermes and by his aid I found out demotic letters, so that all things should not be written with the same letters."[7]

The formula of you-as-he, he-as-you, is found in Hermetic texts. *Hermes to his Son Tat* deals with the revelation of a god: that is, with the process of initiation. The author deals with the creation of a human being in the womb: "examine with care the *technē* of this production, *dēmiourgēmata*, and learn to know who fashions, *demiourgōn*, this beautiful and divine image, *eikōn*, that is man." Then, turning to this divine craftsman, he cries:

> When shall I sing you? One cannot conceive season or time that concern you. And for what shall I sing you? For the things you have created or that you have not created? For those you have made appear or those you have hidden? And on account of what shall I sing you? As belonging to myself, as having something all my own, as being other than you? For you are all that I am, you are all that I make, you are all that I say.[8]

These passages confirm the idea that the drama defined in *Isis the Prophetess* is that of revealing god and initiate.

In general Iris is represented as teaching her son Horos. Diodoros describes how she manifests herself as a healer. "Standing above the sick in their sleep, she gives them aid for their diseases and works remarkable cures upon such as submit themselves to her." She discovered the *pharmakon* of immortality and revived Horos when, after the Titans' attack, he was found under the water, "giving him back his soul and also making him immortal." (There are several confusions there: Horos is merged with both Dionysos and his father Osiris; and the idea that Isis made him immortal is a derivation from magical practices. He was an ancient god in his own right.) Diodoros adds that Horos, "instructed by his mother Isis in both medicine and divination, is now a benefactor of mankind through his oracles and his healings."[9] The Hermetic books carry on the tradition of the aretologies that Isis as the great civilising teacher was herself taught by Hermes. In the *Kore Kosmou* she tells at length of the mission carried out by herself and Osiris, and defines his lore in terms of the analogy of Above with Below, of Macrocosm with Microcosm, which was a part of the alchemic creed.

> There are those who, having learned from Hermes that the atmosphere is full of daimons, have engraved it on hidden *stēlai*.
>
> There are those alone, who, instructed by Hermes in the secret ordinances of God, have made themselves the initiators of the arts, sciences, and occupations of all sorts for mankind. They it is who, learning from Hermes that all things below have received from the Demiurge the order of being in sympathy with those on high, have instituted on earth the sacred functions bound up vertically with the mysteries of heaven.[10]

Thus the prophets can use philosophy (the occult sciences) and *mageia*, magical practices, "to nourish the soul and medicine to cure the afflicted body".

There is one more point in the tale of Isis that needs consideration. Some emphasis is laid on the sign, *sēmeion*, on the head of Amnael. *Sēmeion* means some distinctive sign, especially one of a physical nature, *e.g.* "The High Priest inquired of the leaders there present if the child had a *sēmeion*, and they replied that he was without a sign, *asemos*" (a text dated A.D. 171).[11] Here we would expect the sign to be a tattoo-mark, such as was put on the initiates of various mystery-cults: those of Mithras, Attis, Dionysos, Atargatis.[12] Often the tattooing was done on the brows (as with



Mithraics) or on the arm or hands. On a *kylix* with white ground the Thracian Mainad who kills Orpheus is tattooed with a little stag on the upper part of her right arm; another vase has a Mainad pursuing Orpheus—she is tattooed on the right arm and both insteps with a ladder-pattern.[13] The ritual practice was later interpreted as a punishment for the death of Orpheus; and Ploutarch tells us the husbands of the guilty women tattooed them for their crime and later husbands continued to do likewise with their descendants right down to his time; he comments that he cannot praise them as long-protracted punishment is "the prerogative of the deity".[14] But Isiacs had their heads shaven, so that Amnael might well have been tattooed on the brow or skull. Oath and tattooing are connected in a papyrus.[15]

This account is worth citing since it brings out the close relation of such a text as ours about Isis and Amnael to initiation-experience. The oath is fragmentary, but may be amended something like the following:

> [In the name of the god who se]parated Earth from Heaven, [Light from Dark], Day from Night, [World from Chaos] Life from Death, [and Generation] from Corruption, I swear [in all good faith] to keep [among the secrets] the Mysteries transmitted to me [by the very pious] Father Sarapion [and the most reverend] Sacred-Herald Ka . . . [on whom this] devolves, and by my Fellow [initiates and my dear] Brothers. Faithful to my oath [may I fare well, but] may the contrary befall me [if I reveal anything of it all] . . .
>
> Kautau [pates? . . . with the aid of needles] sharpened [has tattooed on my two hands] seals [so as to] mark [the mystery for ever . . . Then] to the initiates the Father will tell [the sacred discourses or *logoi*].

Despite the mutilations the essential points are clear. The sect in question has been taken as Kabeiric (by the emendation made of *Ka* . . .) or as composed of devotees of Sarapis (by the emendation of *Ka* . . . as Kanopos.) However, it seems more likely to be Mithraic, despite the comparative lack of remains left by that cult in Egypt. The Mithraics had the title of Father for a high stage of initiation; they also had sacred heralds. The *hierokeryx* played an important part at Eleusis, assisting at the initiations, calling for the holy Silence, and reciting the secret formula the initiates repreated after him. We also find him joined with priests at the oath-taking required from functionaries; and he was often named in connection with mystery-cults, *e.g.* at Andania. *Kautau* . . . is probably the

start of an unusual form of Kautopates, who in the Mithraic mysteries stood for the Setting Sun as opposed to Kautes, the Sun of the Morning.

We may note also an odd passage in Dion concerning Augustus and the year 7 A.D.

> He made a vow with reference to the Megalensian Games; for some woman had cut certain letters on her arm and practised a kind of divination. He knew well indeed that she had not been possessed by a god but had done the thing of set purpose. Still, as the populace was terribly worked up over both the wars and the famine, which had now set in again, he too affected to credit the common report and proceeded to do something which would make the crowd cheerful. He regarded such measures as necessary.

There is a further aspect of Amnael. Perhaps in a primitive version of the encounter he was simply a revealing god, Hermes; but here his advent has been linked with the Fall of the lustful Angels. Not that the mystery-revealer might not exact a sexual price for his secret. Clement of Alexandreia says that the Dionysiac Phallus was the emblem of the god's intercourse with a person who told him the way to the Underworld.

> Dionysos was anxious to go down into Hades, but did not know the way. So a certain Proshymnos promises to tell him, not without payment. The price was not a pretty one, though Dionysos thought it was. The god was asked to enjoy the fellow; and he swore, in the event of returning, to do to Proshymnos what he wanted, conforming his promise with an oath. Learning the way, he went down, then returned. He didn't find Proshymnos, who was dead. To fulfil the vow to his lover, Dionysos hurried, all agog, to the tomb. Cutting a branch from a figtree at hand, he shaped it as a penis and then carried out his promise to the corpse. As a mystic memorial of this Passion *phalloi* are set up to Dionysos in cities.

The descent into the Underworld has its ritual mime in the passage of the phallus into the bowels of the corpse, into the cavern of the dead. (The word, *proshymnos*, only occurring thus as name, would mean something like "a hymn sung in addition"; the verb *proshymnein* means "to sing besides". Proshymnos thus suggests the personification of some moment of ritual celebration.) To enter into a mother-goddess would be to go down inside the earth, into the cave-womb or secret chamber of initiation. However that may be, in one of our texts an effort has been made to



connect the Angel in a precise way with the movement of bodies or sphere in the sky. We are told that he needed to revolve round to the correct point in time and space before he could see Isis, and, it follows, he could descend, only at that moment and position. Here it seems that an unconsidered effort has been made to link revelation with astrologic position; and we could assume that the lesser angel represents the spirit of a dekan or some smaller measure of sky-time, while Amnael represents the spirit of a planet. But there is no precedent for such a spirit leaving his post on a mission of revelation or a love-adventure, so that we can only assume that the author of the text in question has over-reached himself in trying to work out a precision which ends by becoming illogical. There is no need then to interpret the sign as a planetary symbol or something of the sort set on the angel's head, e.g. the waterplants on the head of the Waterman, Aquarius (Waterpourer in Greek) in his Egyptian guise.[16] Aquarius is shown holding two water-jars; Amnael has one such jar, which has no role in the story unless it is intended to define his character as an inhabitant of the first firmament, Still, there seems no point in linking Amnael with Aquarius. More likely the picture is that of the Egyptian prophet who bore the sacred vase of Isis in procession.[17] Apuleius calls this *hydreion* or water-jar "the revered effigy of the godhead"—

> not formed like any beast, bird, wild thing or human shape, but, the result of a sagacious invention and by its very novelty something to be venerated and an ineffable emblem of a religion of a higher kind, that should be shrouded in a great silence: and so fashioned in glittering gold: a vessel wrought with hollow bottom, hollowed with the utmost skill, with pictures outside marvellously done in the Egyptian style; the mouth not very high but jutting in a long funnel; on the other side a handle which stuck far out, on it standing an asp rearing its swelling and scaly neck, and entwining it all as in a knot.[18]

In an Isiac procession (in the Vatican) we see the priest holding with both arms, before his chest, a large *oinochoe* decorated with a uraeus-head at the point where the handle joins the orifice. This hydreion, which Apuleius says represented Isis herself, certainly held the holy water of the Nile.[19] We may say then that Amnael as prophet holds the hydreion of Isis, emblem of a cult "that should be shrouded in a great silence". However, he does thus oddly merge with Aquarius, who in his Egyptian form had affinities with Hapi, the god of Nilewater.

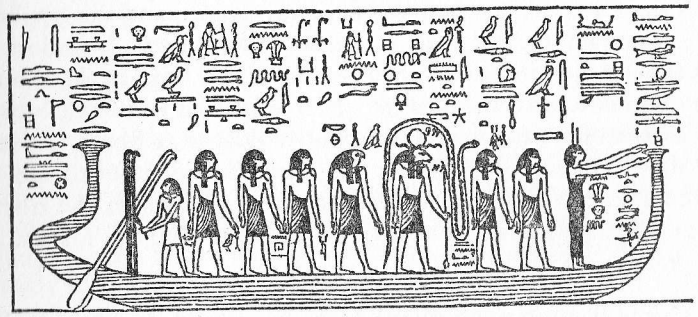
If we may judge by the stories, it was the correct thing to go to the temples of Egypt to be initiated by a vision into some higher knowledge. Demokritos and Ostanes are described as coming from some foreign place. We have seen how often the *stēlai* of ultimate knowledge are located in a temple. That of Memphis was especially venerated by the seekers of knowledge and Zosimos describes the things he saw there. The mysterious John, Arch-priest of Tuthia in Euagia "and the sanctuaries there found", seems of Egyptian provenance—whatever place-names have been corrupted in his description. An alchemic text states, "It is necessary to know in what parts of the Land of the Thebaid is prepared the mysterious powder: Kleopolis (Herakleopolis), Alkoprios (Lykopolis), Aphrodite, Apolenos (Apollōnopolis), and Elephantine."[20] There seems behind this list a memory of places of metallurgical exploitation in Egypt. Afrikanos, who seems an historical character, Sextus Julius Africanus, stated (cited by the Synkellos), "Souphis" of the 4th dynasty of Memphis, ruled "for 63 years. He reared the Great Pyramid, which Herodotos says was built by Kheops. Souphis conceived a contempt for the gods"—perhaps Afrikanos was taking the Great Pyramid as a sort of Tower of Babel. "He also composed the Sacred Book, which I acquired on my visit to Egypt because of its great renown." Eusebios says much the same of Souphis; but the Armenian version of his *Chronika*, adds, "Souphis behaved arrogantly towards the gods themselves; then in penitence he composed the Sacred Book, in which the Egyptians believe that they possess a great treasure."[21] The place-name Hormanouthi, where Isis met Amnael, has been taken as an error for *Hōrmachythi* ("at the place of Horos of Edfu") and this site as the seat of alchemy in Apollōnopolis. Orpheus in the Orphic *Argonautika* speaks of the underworld-journey and the necessary revelation at Memphis as the same sort of thing:

> I've told you other things I've meditated
> and grasped when I went by Tainaron's dark road
> to Hades, trusting in my life, my love
> for her my wife; and how I brought forth the holy
> Egyptian Word, when I entered divine Memphis.

Zosimos writes, "At the eastern entry of Isis' Temple you'll see characters dealing with the white substance [silver]; at the western entry you'll find the yellow mineral [gold] near the orifice



of the Three Springs."[22] We may add that the Gnostic writings show much interest in the life led in and round the Egyptian temples, those centres of economic activity as well as of religious rites.[23] If Afrikanos the alchemist was also the historian of the early 3rd century, we know that he did go to Egypt, presumably from Emmaos in Palestine where he mostly lived; he visited Alexandreia to meet the philosopher Heraklas.[24] St Jerome in his *Life of Hilarion* says, "He went to Memphis so that, after confessing his wound [of love] he might return to the girl, armed with the magical arts; and so, after a year, taught by the prophets [*vates*] of Aesculapius [Asklepios, Imhotep]," he left.[25]



24. The Sungod, with ram-head, standing under a circular canopy made by the serpent Mahen, and sailing on the river of the underworld; his crew consists of Isis, Sia, Heka (god of magic), Horos of Heken, Ka-Maat, Nehes (lookout), and Hu with magical steering-pole (Book of Gates)

But the most extraordinary, because most detailed, account of a quest for revelation in Egypt is that of Thessalos. Though he was seeking medical and botanical knowledge, we may cite it here because it helps considerably to illuminate the psychological experience which is so important for all these Hermetic quests and discoveries, including alchemy. It is possible that he was, in fact, Thessalos of Tralles in Lydia, who lived in the 1st century, dying under Nero at Rome. In the time of Plinius his tomb was still to be seen on the Via Appia with the arrogant title of *Iatronikes*, Healing-Victor. Son of a weaver, he had followed his father's trade for a while; then, despite his slight education, he took up medicine and soon acquired both a great name and a large fortune. He was extremely vain and constantly asserted that

medicine was the highest art and he the best physician. He belonged to the school of the *Methodikoi*, but developed its doctrine and practice so thoroughly that he has been taken as one of the school's founders. His way, in extreme cases, was to bring about a thorough commotion or disturbance in the constitution of the organism: synkrisis. For this purpose he used, internally and externally, strong vegetable remedies for three days, together with a very strict regimen and the use of emetics at intervals. A period of fasting following, and then a course of restoratives. His reputation seems to have soon waned, though Galen often mentioned him with scorn and ridicule.[26]

This proud and opinionated character seems to fit fairly well with the tone of the narrative of the revelation; and the emphasis on vegetable remedies harmonises with a deep botanical interest. The identification is thus by no means impossible, though the obsession with magical procedures is hard to reconcile with the career of an acceptable if eccentric doctor at Rome. At least we should expect Plinius to have some sinister tales to tell, or Juvenal to have written a blistering line or two on the doctor from Lydia. However that may be, the narrative is a fascinating document:

To Caesar Augustus, Greeting! Many have tried during their life, Augustus Caesar, to deliver up the secrets of lots of marvellous things, but none of them has been able to complete his project because of the fatal darkness that came to overwhelm his spirit; and I then seem to be the only one of all those who have lived since the beginning of time to have composed a marvellous treatise. Indeed, though I had undertaken a task that goes beyond the limits of human powers, I have been able to crown it with the end that it required—not, it is true, without many trials and dangers.[27]

After being trained in the science of grammar in Asia and becoming more learned than the people of that country, I decided to turn my knowledge to account for a while. So I set sail to that town where all flocked, Alexandreia, Furnished with a good sum of money, I frequented the most accomplished philologists, and everyone praised me for my love of study and quickness in understanding.

I was also steadily assiduous in learning from the dialectical physicians; for I was consumed by an incredible passion for that science Then, as the time had come for me to return home—for I was already. far enough advanced in medicine—I began to scour the libraries in quest of knowledge. There I came on a book by Nechepso, describing 24 ways of treating the whole body and every malady, according to each



Zodiacal sign, with stones and plants. I was confounded by the wonderful grandeur of the undertaking. But it held apparently nothing but the vain phantom of a royal futility. For I prepared to no purpose the Heliac Pill recommended by the author together with other recipes. I failed in all my attempts to treat illnesses.

This mistake I felt as something more cruel than death. I was eaten up with chagrin. Indeed I had trusted so blindly in the book that I had boasted about the virtue of these remedies to my parents, and had told them I'd return home as soon as I had tried them out. Now I could not remain at Alexandreia because of my colleagues' mockeries; for it's the way of fine exploits to arouse jealousy. Besides I wasn't eager to return as I had been convinced of my incapacity to carry out my promises.

So I began to travel about Egypt, driven on by this goad that wounded my soul, seeking some way of making my rash hope, or, if I failed, resolved to abandon life by suicide. As my soul predicted to me ceaselessly that I'd have communication with the gods, I went on raising my hands to heaven, begging the gods to accord me, by a dream-vision or by an inspiration from on high, some favour of which I might be proud, returning, joyous, to Alexandreia and my homeland.

Thus I arrived at Diospolis [Thebes], the most ancient capital I mean of Egypt, which possesses a host of temples; and there I established myself. In effect there lived there priests, friends of letters and learned in many sciences. Time passed. My friendship with the priests went on increasing all the while. One day I asked them if something of the operative force of magic survived. I noticed that most of them were shocked at my boldness in conceiving such hopes; but one, who inspired confidence by the gravity of his manners and his great age, did not disappoint my friendship. He assured me that he had the power of producing visions by means of a basin filled with water.

I then invited him to stroll with me in the most deserted part of the city without telling him what I wanted. We came to a woodland environed with a profound peace, and there I suddenly threw myself down on the ground, and, weeping, embraced his feet. And as he, bewildered at this unexpected act, asked me why I had done it, I declared that my life was in his hands, that it was absolutely necessary for me to converse with a god, and that, if this desire was not satisfied, I was ready to give up living. Raising me up from the earth, he quieted me with the most amiable discourse, promised cordially to yield to my prayer, and bade me fast for three days.

As for me, my soul was completely melted at the declaration of these promises. I kissed his hand and heaped him with thanks, weeping like a fountain. For it's a law of nature that an unhoped-for joy provokes more tears than grief. Then, emerging from the wood, we began to fast; and those three days, in my impatient condition seemed to me as many years.

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When the third day was come, from the moment of dawn, I went to greet the priest. He had prepared a suitable chamber with everything needed for the consultation. On my side, always prepared, I had brought, without informing the priest, paper and ink for taking notes, if I had the chance, of anything said. The priest asked if I wanted to talk with the ghost of a dead man or with a god.

"With Asklepios," I told him, adding that he would crown his kindnesses if he let me converse with the god on my own. He agreed without pleasure, as I could tell clearly from his face, but at least he promised. Then he shut me in the chamber, bade me sit down opposite the throne where the god would take his seat, and invoked Asklepios, thanks to the virtue of mysterious words. After that he hurried out, locking the door with a key.

And there I was seated, annihilated in body and soul at the sight of so wonderful a thing—for no human word could render the features of that face or the splendours of the ornaments that set it off—when the god, lifting his right hand, saluted me thus:

"O blessed Thessalos, today a god honours you, and soon, when men learn of your success, they will hold you in reverence as a god yourself. Ask me what you please, I will reply to you faithfully in all matters."

I could scarcely speak, so much was I carried out of myself and so much fascinated by the god's beauty. Still, I asked him why I had failed in trying the recipes of Nechepso.

The god answered me, "King Nechepso, highly intelligent man as he was, and possessing every magic power, had not however received from any divine voice the secrets that you want to learn. Endowed with a natural sagacity, he had grasped the affinities [*sympatheiai*] of stones and plants with the stars; but he did not know the moments or the places were the plants must be gathered. The growth or the withering of all fruits of the season depend on the efflux [*aporrhoia*] of the stars. Further the divine spirit [*pneuma*], which in its extreme subtlety passes through every substance, is spread in particular abundance in the spots which the astral influx successively reached in the course of the cosmic revolution."[28]

The god then expounds a pneumatic explanation of the diversity of virtues in plants according to the different climates in which they grow; and ends with technical advice as to the ways of gathering them, with a final prayer. Thessalos has promised to hold the revelation secret: "to keep with care the discourse delivered to you without transmitting it to anyone who is a stranger to our art."

We may note a few points in the story which help to authenticate a 1st-century background, though they do not prove it.



The priests are indignant at Thessalos' question because magic is a capital offence. The description of Thebes accords with that given by Strabon:

> Even now traces of its magnitude are pointed out, extending as they do for a distance of 80 stadia in length; and there are several temples, but most of these too were mutilated by Kambyses, and now it is a collection of villages, part of it in Arabia (the eastern side of the Nile) where was the city, and a part on the far side of the river, where was the Memnonion.[29]

What perhaps most strongly suggests a fairly early date is the directness and coherence of the narrative, despite supernatural aspects. Divinations have been classified under three headings: (a) theurgic, in a sort of ecstatic state, when the gods makes his unmistakeable advent: the person concerned may feel himself awake or dreaming; (b) magical, where the god or the divine force makes an indirect advent or impact, through material objects (lamp flame or basin of water) or through a medium whom he possesses; (c) goetic, where the force animates an object by imprinting on it certain movements or modifies certain of its proportions.[30] Thessalos' experience was of the first type; and it has been asked whether he was in an hallucinatory state as a result of fasting, excitement, strain, or whether the initiator had hypnotised him and suggested the vision to his already heightened sensibilities. We cannot tell. Certainly, as we know from the evidence of what primitive folk have been capable of imagining and feeling as reality during initiation-ordeals accompanied by fastings, men like Thessalos were able in these centuries to convince themselves of strange things. What is hard to harmonise is the direct experience of the advent, which we can pass off as the result of a dream-hallucinatory state controlled by an intense hope of contacting the sources of truth and certainty, and the aftermath of detailed recipes and so on. Unless we are to take the whole thing as a fabrication—and that is a very unlikely hypothesis—we must assume that the priest-initiator, after playing his part in directing the liberated fantasies of Thessalos, provides the recipes and assures his disciple that they have been left by the god. Thessalos, in a mixture of good faith and desire to tell as convincing a tale as possible, then makes the transition from vision to recipes much less abrupt or unclear than it actually was.

There certainly were magicians who faked their effects. Hippolytos informs us of the magician who "after making obscurity in the chamber"—*oikos*, the same word as that used by Thesallos for the place of advent—"boasts of bringing about his presentation with the aid of gods or demons, and if anyone happens to ask to be shown Asklepios, invokes him by this prayer." We are then given eleven hexameters of invocation or *epiklēsis*. "When he has finished with this pleasantry, an Asklepios of fire appears on the wall at the back." Then we are told of a performance of lekanomancy, basin-divination, and recipe for falsifying seals. At last Hippolytos comes back to the explanation of the fire-revealed god. The magician, "after drawing on the wall the silhouette he wants, coats its surface secretly with a pharmakon composed of the following mixture: Lakonian Purple and Bitumen of Zante. Then, as if in an ecstatic delirium, he moves near the wall a flaming torch and the drug takes fire, throwing out a great light."[31] As the bitumen could be dangerous, phosphorescent substances were commonly used. Elsewhere we are told: "If you want to draw on the wall any living thing (*zōidion*) you like, even with night coming on, whoever sees it in the dark will run off, thinking it demons or gods."[32]

But we must remember that Hippolytos is a Christian anxious to debunk such phenomena. Fakings certainly existed, but also experiences such as that of Thessalos, which, however induced, were subjectively honest and sincere.

Two prayers or incantations to be uttered at herb-gathering may be given here to bring out how close were the principles in such procedures to alchemic doctrine. The first develops the notion of Sympathy into that of the Union of Opposites. It was to be said before the rising of the sun:

Lord, Master of the Universe, Author of all Creation, invisible and visible, you who of this Visible Creation have made certain parts naturally allied and harmonious one with another so that they own the same power in their beings that are born by means of it, and who have made other parts in return not sympathetic, not harmonious, except that, in this state, from their fusion together and from their union, there results a well-tempered mixture, and these things are the heralds proclaiming from afar your Majesty: you then at this moment still when I gather the plant here NN which you have made smypathise with the planet NN, consent that it may be strong and filled with your might and fully efficacious for use in medicines which are drawn from



it against the maladies that afflict your creature, with the aid of this same beginning that obeys your command, for your name is blessed and glorified ages in ages Amen.[33]

The same prayer is to be said in preparing the medicine and in using it.

The second prayer shows the magician making himself into Hermes by the ritual act. It is remarkable also for the lavish way in which it personifies the flower or herb as deity after deity, thus both glorifying and magnifying the virtues inherent in it, and placating it, winning it over so that it will not resent the act of gathering, but will allow all the magnified virtues to be taken over:

You have been sown by Kronos, conceived in the womb of Hera, kept from all evil by Ammon, brought forth by Isis, nourished by Zeus of Rain, raised to maturity by Helios and Dew.

You are the Dew of all the Gods, you are the Heart of Hermes, you are the Seed of the Ancestral Gods, you are the Eye of Helios, you are the Light of the Moon, you are the ashes of Osiris, you are the Beauty and the Splendour of the Heaven, you are the Soul of the Daimon of Osiris which goes dancing in every place, you are the Vital Breath of Ammon.

As you have lifted up Osiris, so lift up yourself. Rise up as Helios rises every day. Your Height is equal to that of Helios at the zenith, your Roots are as deep as the Roots of the Abyss, your Powers are in the Heart of Hermes, your Stalk and your Branches are the Bones of Mnevis, your Flowers are the Eye of Horos, your Seed is the Seed of Pan [Min].

I wash you of this Bitch as I wash the Gods. Be you then also purified by my prayer for your Salvation and give us your Force like Ares and Athena. I am Hermes. I gather you with Good Fortune, with the Good Spirit, at the right hour of the day, on the day when everything must succeed.[34]

Note the mixture of Greek and Egyptian deities. Another magical text has, "I am Isis who is called Dew." The Daimon of Osiris is the Ka (which we may call roughly the Double in Egyptian religious psychology). The little plant is swollen in the ritual moment into a cosmic tree, linking the Above and the Below.

In all primitive religion there is a sense in which the earth itself and the spirit-world are one, though the unity is only realised normally at a ritual moment. The relation is thus a dynamic one, continuous and yet only sporadically grasped.

With the growth of civilisation the unity tends to break up and the secular world from which the impact of spirit or god has been eliminated extends its range. Apart from ritual moments, it is at moments of fear and uncertainty, when the unknown is felt to be invading the individual or collective existence, that the sense of a pervasive spirit-world reasserts itself. In ritual-myth and in meditations about the gods, efforts are made, consciously or unconsciously, to define the relations of the two worlds and to set up certain boundaries. A culture like that of the Mesopotamians, with its steady concern for the world of the stars, is in a position to work out elaborate systems in which the other world (largely seen now as a sky-world) is both separated from the earth and then reconnected with it, both in general schemes and in particular networks. Hence it seems that this culture, or set of cultures, first at all fully elaborated schemes of heaven-earth correspondences. A text of the Kassite era (the second half of the 2nd millennium B.C.), together with the fragment of an Assyrian tablet and a tablet of the Seleukid epoch, serves to show how far back such schemes went and how strong was their persistence.

Here is a summary of the third tablet:

Gypsum is the god Ninurtu [wargod]. The pear is the demon asakku. The meal mash is Lugalgirra and Meslamtae [lesser gods of Nergal's cycle, underworld gods]. Three meal-cakes are the gods Anu [heaven], Enlil [earth] Ea [waters]. A great bull's skin is also the god Anu. The copper drum is Enlil. Seven big reed-poles are the seven great gods of Ishara [an aspect of Ishtar, a goddess of fertility]. The scapegoat is Ninamashazagga, spirit of herds.

The censer is Kusud "the great libation-pourer" [or a grain goddess: it appears under both male and female aspects]. The torch is Nusku god of fire in the pantheon of the town of Nippur, but also Gibil god of fire in the pantheon of the town of Eridu.

Then comes the assimilation of metals to certain gods, though the text is defective, and then the various parts of the body with their correspondences. Now let us look at the tablet of the Kassite epoch:

The vase agubbu is Ninhaburkuddu, queen of incantations. . . . The tamarisk is Anu. The palmtree-head is Tammuz. The plant *mashtakal* (? sage) is Ea, the reed *salalu* is Ninurta. The plant *el* [? craetegus] is the goddess Nina. The wood *bur* is the god Girra. Silver is the Great God [moon]. Gold is Enmesharra [sun]. Copper is Ea. Lead is Ninmah [here a great mother-goddess] . . .



The cypress is Adad. Variegated wool is Lamashtu, daughter of Anu. The aromatic Zu is Ninurta. The censer is the god Urash. The torch is the god Gibil. The pure incense is the god Negun [son of Ninlil, consort of Enlil]. The amphora [?] is Igi-balag, gardener of Nergal. The skin of a great bull is Ninda-Gud [priest of Enlil]. Gypsum is the stormgod [Ninurta]. Bitumen is the rivergod. The scapegoat is Kushu [demon of plague, son of Anu]. The Living Lamb is Girra [god of herds, not Girra of plague]. The goatbitch of sacrifice by burning is Muhru.

The barley grains, the dining-table, the pots *gagz* are Ninurra-Ea [here gods of potters]. The weapon with seven laurel-wood heads is the storm, the weapon is Marduk. The goat of Ungal [patron god] of Nippur. The crane is the god Ninsig [Ea of metallurgists]. The . . . of cedar is the weapon of Zu [the birdgod who stole the tablets of fate] . . .

The white wine and its vessel are the eyes of the consultant [?]. The white fig is his chest. The *nur* fig is his knees. The fig is his loins. The sweet wine is his lower-stomach. The god Kushu [is] in the ceiling of the room. The god Muhru before the city-gate. The god Sakkut in midst of the ponds. The god Silakku in the ruins. The god Equrum in the leg-muscles. The god Abbagula in the wall . . .[35]

The text ends with the formula: "Let the initiated explain it to the initiated; he who has not been initiated must not read it." And we are told it is a copy of an ancient tablet owned by the temple Eshumera at Nippur. We see that everything on earth has its divine exemplar; the two aspects, the divine and the earthly, are both fused together and separate, the earthly reflecting or expressing the divine. Under the extreme intellectualising pressure at work in Greek philosophic circles, the divine was cut away and became the transcendent Ideas of Plato. With the Stoics a more organic sense reasserted itself; and among the alchemists the divine aspect (that of energy, of formative and transformative process with its dynamic element of extending significant structure) became fully fused afresh in theory with the material aspect. That is, in alchemy we find the earlier correspondence-schemes lifted on to a new level, still holding many fantasy-elements, but tending towards scientific systems of inter-relationship.

# 10

# Ancient and Contemporary Crafts

BEFORE we turn to the historical figures of alchemy, we should glance briefly at the various craft-traditions which underlay the ideas and methods of the art. From the very first, metallurgy must have involved various magics and ritual-practices with their expression in myth. The extraction of metal from ore was itself a form of transmutation, which must have produced a great awe and sense of wonder translated into rituals meant to safeguard, analyse and help the processes. The same situation appeared in other crafts connected with fire as a transforming agent: cooking which changed flesh or plant in various ways, and pottery-making which changed a soft, pervious substance into a hard, impervious one, giving earth something of the character of a stone. In all these processes the qualities of the materials were changed. Such important craft-systems, considered to involve dangerous potencies and crucial moments of change, were hedged round with ritual secrecies, oaths, mysteries of all kinds. The operators formed a fraternity fiercely guarding its lore. There was clearly a period when the smith was a sort of semi-divine shaman owning hidden forms of contact with the spirit-world. We cannot here explore this field, but may point to the abundant evidence in Africa and Asia for this phase; to the identification of the smith with the shaman-heroes of the Finnish *Kalevala*.[1]

There would appear to have existed at several different cultural levels (which is a mark of very great antiquity), a close connection between the art of the smith, the occult sciences (shamanism, magic, healing etc.) and the art of song, dance, and poetry. These overlapping techniques, moreover, appear to have been handed down in an aura of sacred mystery comprising inititations, specific rituals and "trade secrets." . . . One element is constant—that is the sacredness of metal and consequently the ambivalent, eccentric and mysterious character of all mining and metallurgical operations. Certain mythological themes of



the earlier stone ages were integrated in the mythology of the age of metals. What is especially significant is the fact that symbolism of the "thunderstone", in which projectiles and stone missiles are compared with the thunderbolt, underwent a great development in the mythologies of metallurgy. The weapons which the smith-gods or divine-smiths forge for the celestial gods are thunder and lightning. (Eliade).[2]

We cannot follow up these points; but we must remember that the craft-lores of miners and metallurgists had existed for millennia and had developed rich traditions. Sumerian terms, carried on by the later Akkadians, Assyrians and Babylonians, can often be identified; and we meet many minerals as well as terms for processes, such as cooking, leaching, washing, roasting, which play an important part in due time in alchemy.[3] Texts show, however, that there was a kind of secret language, using effects of similar sounds. Thus, a recipe for making glass dating back to the 17th century B.C. uses *erū*, eagle, for *ērū*, copper. *A-ba-an* (stone) is written *ha-bar-an*, the signs *ha* and *bar* having also the values of *a* and *ba*. Crude sulphur is called the bank-of-the-river. We also meet craft-jargon, abbreviations and Sumerian values imposed on Akkadian terms in technical works as well as in those of astronomers and physicians. Cryptograms occur in medical texts: lion-fat, human-fat for opium and blood-of-a-black-snake for castor-oil are common. "Let him that knows show him that knows; but he that knows shall not show him that does not know," says a 7th-century work. On tablets concerned with glass-making in the Kassite period of the 2nd millennium there are prohibitions against making the lore known. There is also an insistence on correct and exact copying that springs from a belief in the magical efficacy of the text as it has been used.[4]

Artificial alloys were also known. Inlays and metalwork show the use of both natural and synthetic alloys; the delight in rich colours led to various combinations and experiments. Sardeis, the city of the Lydian empire ruled by Kroisos, which played an important part in the creation of coinage proper, has revealed a 6th-century workshop near the torrent of the Paktolos, which ancient writings reported to be rich in gold-bearing sands. Fragments of gold, parts of crucibles, blow-pipe nozzles and other apparatus were found; in the area were more than 300 small clay basins in which gold was refined from ore by blowing intense flame through pipes, and furnaces in which silver had been

separated from gold. Some of the gold appeared to contain bits of silver and it has been conjectured that the king may have deliberately debased one of the earliest currencies.[5]

The Babylonians knew an excellent test for gold—cupellation. A mixture of metals, including gold and silver, is heated strongly for a while in air, plus some lead, in a cupel, a porous vessel made of bone-ash. The lead and copper, oxidised, pass through the cupel, while the gold-silver remains as a metallic button. The silver can then be removed by heating again in a cupel with some sulphur compounds, which convert the silver into its sulphide and allow it in turn to pass through the cupel. Thus only the gold is left. This quite sophisticated process was invented in north-east Asia Minor in the first half of the third millennium B.C.[6] The fining-pot of the refiner's-fire are often mentioned in the Bible.[7]

In the 14th century B.C. the pharaoh Akhenaten was in correspondence with Burrahuriash II, king of Babylon. A letter from the latter complained, "The 20 *mnas* of gold were not complete. When it was put in the furnace, it did not come forth 5 *mnas*."[8] The metallurgists of these days would not easily be deceived by faked or adulterated metals; but at the same time their power of manipulating metals, *e.g.* converting silver into its sulphides, must have stimulated ideas of yet further conversions. Egypt was the most abundant source of gold in the ancient world, and we should have expected its smiths to acquire what technological skills were available, for dealing with it.[9] They were able to make extensive use of gold in colouring decorative work; the hues range from bright yellow, grey, various shades of red, reddish-brown, brick-colour, to dull purple-plum and an odd rose-pink.[10] Much was no doubt due to chance and the natural mixtures of silver, copper, and iron in varying quantities, but in some cases the stain was caused by organic matter. The rose-pink was a heat-resisting coat of oxide of iron, produced by dipping the object in an iron solution and heating it.[11] This process was used many centuries before the oldest written recipes for tinting vessels. Old Akkadian texts describe ways of staining mineral and stones by cooking them in solutions or embedding them in chemicals to produce faked gems. The importance of colour is brought out by the syllabaries. The sixteen Akkadian terms for gold include nine referring to colour or shade. The colours were valued for their beauty but they also had their magical virtues.

The Assyrian library of Assurbanipal has left many tablets



dealing with glass. In all glass-making the essentials are silica, an alkali, and lime (or less often lead oxide); a decolorising agent like manganese is generally added. Analysis of window-glass from Pompeii shows silica 69, soda 17, lime 7, alumina 3, iron oxide 1, manganese and copper traces. Many colouring agents have been found in ancient glass. Assyrian blue glass used copper, red glass used cuprous oxide. Assyrian white glass has tin oxide, lead antimonate has been found in yellow. One recipe seems to have in rudimentary form the Purple-of-Cassius, the aim being apparently a pink or red coral. The ingredients are 7,200 parts of ordinary glass, 32 of oxide of tin, 20 of antimony, an unreadable portion of salt or saltpetre, and 1 part of gold. The proportion here of gold (·014%) is the usual order of magnitude in the preparation of ruby glass. A Mesopotamian text going back to the 17th century B.C., to the reign of Gulkizar, gives us several recipes of metallurgical chemistry:

> To a *mina* of *zuku* glass add 10 shekels of lead, 15 of copper, ½ shekel of saltpetre, ½ of lime. Put it on to smelt and you'll obtain Copper of Lead.
>
> To a *mina* of *zuku* glass add 10 shekels of lead, 14 of copper, 2 of lime, 1 of saltpetre. Put it on to smelt and you'll obtain Copper of Lead.[12]

These recipes are not alchemic, but they show already a sophisticated sense of fusing and modifying metals.

We noted that we should expect Egyptian smiths to be in the forefront of gold-techniques. However gold does not seem to have been refined or purified till the Persian period (525–332 B.C.) when the method presumably came in through Persian and Syrian influences—and with it much of the myth and ritual connected with the techniques.[13] Agatharkides described in the later Ptolemaic period the way of refining gold with lead, salt, tin and barley-bran; no provision seems made for recovering the silver, which would have been lost. Debasement of gold, however, is found far back, near the end of the 18th dynasty; rings have up to 75% of copper.[14] Cobalt was used in glass colouring from the 18th dynasty; as in Egypt it occurs only as traces in other minerals, the glass-makers must have been in contact with the industries abroad, in Persia and the Caucasus. The early use of cobalt is of interest in general, since the ore is not blue and does not suggest its colour-possibilities.[15] The Egyptians early learned

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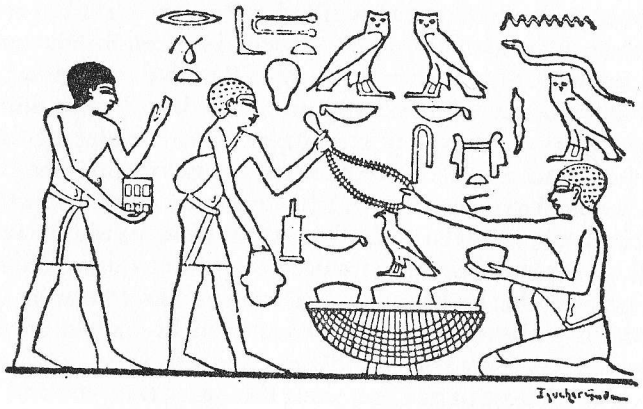
how to glaze; a piece of glazed steatite comes from the Badaean epoch, glazed powdered quartz faience and then glazed solid quartz from predynastic times, then glazed pottery on till the Arab period.[16] In faience a vitreous alkaline paste is used; the colours were mostly blue, green, or greenish-blue, but at times we meet violet, white, yellow, or two or more colours; an extra layer was also used to enhance or modify the effects. The period when lead glazes came in is uncertain and much debated.[17]

The magical effects of colours were often deduced on the principle of sympathies. Galactitite (evidently white) was thought to promote the flow of milk in women; amethyst seems to have been considered a defence against drunkenness on account of its wine-like hues.[18] An old Sumerian hymn compares the change from light to darkness with that of gypsum into bitumen; and words like "night" and "day", *salmu* and *pisū*, are often used for black and white.[19] By neo-Babylonian or Chaldean times the correlation of stars or gods with metal has developed. Silver becomes the metal of Marduk, gold that of En.Me.Shar.Ra, copper that of Ea; a tablet allots silver, gold, copper, tin, to Anu, Enlil, Ea, Nin-a-mal; other tablets connect gods, metals, plants, stars.[20]

In Egypt, Ptah of Memphis was "master of gold-smelters and goldsmith", his temple was the Goldsmithy, his priests had titles like Great Wielder of the Hammer, or He who Knows the Secret of the Goldsmiths. The tradition of Memphis as a gold-centre was remembered by the alchemists; Zosimos said, "I have



25. Bartering a necklet for perfume



examined in detail a furnace in the ancient temple of Memphis." Ptah was a creator-god, and his cosmic role had been formulated already by his priests in the Old Kingdom.[21] Echoes of their thought can be found in texts of all periods; but what seems the original statement was copied under Shabako (about 700 B.C.). It accepts the gods of Heliopolis and Hermopolis but subordinates them to Ptah, of whom they are seen as forms. First comes Ptah who is upon the great (primeval) place; then Ptah as the Waters; then Ptah-Naunet, the female counterpart of the spirit of the abyss; then Ptah "the very great [ancient] one who is the heart and tongue of the divine company." As creator, he represents the seat of intelligence (heart) and the organ of spech that translates thought into command (action). In all he takes eight forms, of which the last is the lotus. "The supreme god is Ptah, who has endowed all the gods and their Ka's through that heart [of his] which appeared in the form of Horos and that tongue [of his] which appeared in the form of Thoth, both of which were forms of Ptah."[22] We thus see him in a hierarchical series of manifestations or transformations while remaining a single person. If the priests or craftsmen applied this conception of him to the metallurgical processes over which he presided (and in which in a sense he would be incarnated), they were approaching a proto-alchemic position.

There is much more we might profitably consider in early metallurgy, but the above points are sufficient for our purposes. If we turn to the alchemists we find that they seem to have used four main methods in goldmaking: they produced yellow alloys of base metals like brass; they prepared debased gold; they superficially coloured metals or alloys; they tried a set of complicated processes in which distilled liquids were used or in which metals were subjected to the action of vapours. The last method was the important one.

The brass-like alloys (including some of the alloys of copper, tin, zinc), which have been made in modern times under names like ormolu or mannheim-gold, were known to the alchemists. They prepared them by smelting mixtures of copper, tin, etc., with *kadmia* (a mixture of metallic oxides with a variable proportion of zinc, found in the flues of the furnaces). This impure and uncertain material cannot have yielded regular results, which may be the reason for the differing recipes for its use. As for the brass

alloys, the alchemists seem to have prepared a number of them with copper as the main ingredient, plus tin, lead, zinc, iron, silver, mercury, or some of these. Doublings of gold, so-called, probably often involved copper and silver. Silver gives gold a greenish, copper a reddish tinge; the admixture of both copper and silver hardly altered the hue. The alchemist would interpret the effect as showing that gold as a seed acted on the silver and copper, growing at their expense, till the whole amount became gold.

Superficial colouring was probably understood for what it was, at least to some extent; it is called tinging, not making, of gold. Then as now three main methods were used. The metal was coated with a tinted lacquer of gums; solutions were laid on to form a thin layer of sulphides; the base metal in debased gold was removed from the surface by corrosive substances so that a layer of fairly pure gold was left showing. (The corrosive would be something like sulphur trioxide got by calcining sulphates of iron and copper.) But the typical alchemic process involved volatile substances, spirits, and was done by means of distillations and sublimations. All pictures of apparatus or workshops show instruments for dealing with volatile substances. Only such apparatus could be imagined as extracting the spirit from a body or re-infusing it.[23]

We may now pause to glance at the random indications we get in the papyri of the trades which played their part in bringing alchemy about. First, the metallurgical. The mining of metals and semi-precious or precious stones remained a government monopoly in Egypt under the Romans.[24] The government also controlled the quarrying of granite, porphyry, marble and the like. Working conditions seem to have been miserable; and more than elsewhere in the empire compulsion was used to get labour.[25]

26. Egyptian unguent-maker's workshop



Criminals were also sent to the mines. We know little, however, of the minerals mined. Copper, gold, iron, lead, and manganese ores are still found in the eastern desert and in the Sinai peninsula, but how far they were worked by the Romans is uncertain. Some gold still came down the Nile from Aithiopia. Antimony, cobalt, and tin were imported. Philostratos gives us a picture of the barter-system on the borders of Egypt and Aithiopia: "When he [Apollonios] arrived at the frontier—at a place named Sykaminos —he came across a quantity of uncoined gold, an elephant, and various roots, myrrh, and spices, all lying there without anyone to guard them at the crossroads." Apollonios contrasted the honest ways of the folk there with the commercial greeds of the Greeks:

> Contrast our good Hellenes. They pretend they can't live unless one penny begets another, and unless they can drive up the price of their wares by chaffering or by creating a scarcity. One pretends he's got a daughter due for marriage, another that his son is just reaching manhood, a third has to pay his subscription to his club, a fourth is having a house built, a fifth would be ashamed to be thought a worse man of business than his father before him. What a splendid thing if wealth were less honoured and equality flourished a bit more, and "if the black iron were left to rust in the ground." Then all men would be in accord and the whole earth like one brotherhood.[26]

We gain a few glimpses of the premises of goldsmiths in contracts. Thus, in 18 B.C. at Alexandreia Apollonios, son of Sarapion, made a contract to cede his goldsmith's shop to Euangelos, son of Archoneus, on "receiving the balance of 300 silver drachmai on or before 9 Phamenoth". The premises include "the shop, the tables built for the trade and . . . belonging to him in the inner circle of the square portico on the street(?) leading westward, The neighbours on the south being Eirenaios, on the north Apollophanes, on the east Sosibios, and facing the street on the west." There were several strict terms:

> The costs of the cession are borne by Euangelos himself. In addition it is agreed that Apollonios shall give undisturbed possession, inviolate and free from rental charges up to the present month Mecheir of Caesar's 12th Year. And Apollonios shall at his expense withstand anyone, who may proceed against him or lay claim to the property for private debts, nor shall he himself take possession nor use the law and custom about any such transactions. But if he violates any of these provisions, apart from the agreement being valid, he shall pay what he

has received on the principal with a penalty of 50% immediately and besides 500 dr. in silver as a private debt, and damages and costs as well as the prescribed penalty.

Euangelos shall have the right of exaction from Apollonios himself and from all his property as if legal judgment had been pronounced. And if Apollonios makes any evasion in the matter of cession, it shall be possible for Euangelos, on depositing the balance of 300 silver dr. at an authorised bank in the name of Apollonios, the risk of the bank falling on Apollonios, and on transferring a copy of this agreement to the Record Office of the Porch, to effect a cession from the name of Apollonios and those associated with him to his own name or to whomsoever he chooses without personal recognition and without requiring the presence of Apollonios himself, the cost of the transfer falling upon the latter.

But if in his turn Apollonios is ready to make the cession in accordance with the agreement and Euangelos does not pay the balance of 300 silver dr. in the prescribed time, he shall pay them with a penalty of 50% increase and for over time he shall pay interest at the rate of 2 dr. per mna a month. We request that this agreement be recorded. Registered in Caesar's 12th Year, 8 Mecheir.[27]

A similar cession dated 128 from the village of Euhemereia is much shorter:

From . . . , registered in the ward of Horion Hierax, and from Gaius Longinus Priscus, honourably discharged from the Army as he claims, we wish you to cede to us for a further term of 4 years from the month Sebastos of the present 13th Year of Our Lord Hadrianus Caesar the Goldsmith's Industry at the Village of Euhemereia at a yearly inclusive rental of 264 dr. in silver, which we shall pay in equal instalments on the 10th, 20th, and 30th of each month, all other charges to the treasury being borne by . . .[28]

We are given a rough view of the accumulation of trades in a town of the early Byzantine period in a document probably dealing with Panopolis, which Strabon had called "an old settlement of linen-workers and stone-workers". In this, the town of Zosimos, the poet Nonnos, and several other interesting writers, we meet weaver, oilmaker, fuller, potter, miller, scent-maker, carpenter, perhaps machine-constructor (for irrigation-works), linen-weaver, weaver of rush-ropes or mats, smith of bronze (*chalkotypos*), and four goldsmiths as well as a workshop, *ergasterion*, without qualification. There seems a tendency for the workers of the same trade to gather in the same district. There were also

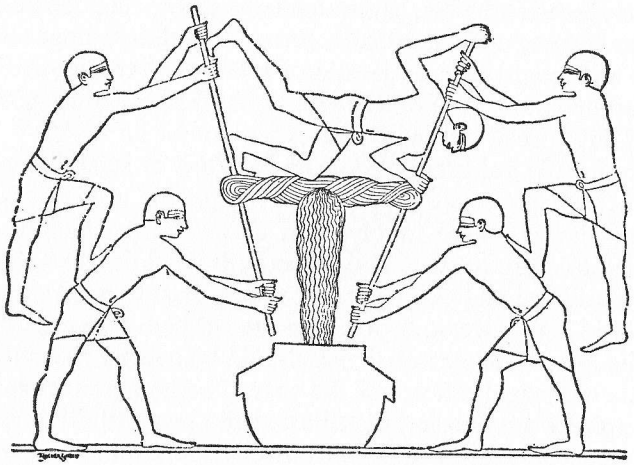


sellers of bread and wine, bath-attendant, sailor, shepherd, schoolmaster, lawyer, doctor, banker, not to mention trumpet-player, priests and magistrates. Interestingly there was a temple dedicated to Agathodaimon, though whether he was merely a town-guardian or had any special link with smiths we do not know.[29]

Occasionally goldsmiths come up in letters or legal documents. In A.D. 178 six persons, superintendents of the golden statue of Athene-Theoris, were involved in a case of peculation. They appealed to a prefect who had recently decided the case. A statue of the goddess had been made and someone embezzled a quantity of gold in the process. A previous prefect had given the verdict that the loss, 18 talents of silver, should be met by the craftsmen and the municipal officers of the year. The new prefect substantially upheld this verdict, distributing the responsibility between the contractor, the inspector, the officials who paid out the money, and the overseers, who now apply for relief. They do not deny responsibility, but ask that two gymnasiarchs and a third official whom (they allege) had been concerned in the disbursements, should be ordered to aid them; they also ask for an extension of time, offering a yearly payment of two talents and claiming that the existing order would bring them to ruin. The craftsmen are described as *techneitai chrysochooi*.[30]

In a petition dated 5 September 296 two women, Thaēsion and Kyrillous, daughters of Koprēs of the village of Karanis, were acting through their maternal uncle Ammonios. Their father had died (probably in 283–4) and they assert that before his death their stepmother admitted that her husband owed her nothing, yet later persuaded her father to remove seven sheep from the flock he left. As reason for the act, she insisted that her dead husband had owed her a *mna* in gold; but she failed to prove her case. So she brought up a contract supposed to have been made by Koprēs which assigned her a half-interest in a slave-girl as security for her dowry. The daughters in reply stated that by law all dowries recorded in writing must be evalued by a goldsmith (for jewellery and metal objects) and a tailor (for clothes), and they denied that the contract of dowry or that of security upheld the stepmother's demands.[31]

We get some idea of what a goldsmith's workshop was like from one of the panels of the Black Room in the House of the Vettii at Pompeii. A big furnace stands on the right; behind it a workman (represented by a Cupid) is busy chiselling a metal



27. Egyptians using a torsion-press

bowl, probably one of bronze, which is being prepared for silver-inlays—such a bowl was found in the shop of a trader in bronze-work, *negotiator aerarius*. A second Cupid-worker keeps the furnace blazing with a blowpipe and heats a piece of metal held in tongs. A third hammers a small bit of metal on an anvil. Near him is a counter with three open drawers and two pairs of scales, one large, one smaller. A lady-customer discusses with the goldsmith the weight of a jewel and beyond them two more workers hammer a big piece of metal on an anvil.

Goldsmiths were used by hard-up persons for the sale of valuable objects. A letter, probably of the 2nd century A.D., shows a man in trouble, writing to some one (perhaps his wife) about the disposition of articles:

I paid you 32 dr. by weight for the . . . of the embroiderer. I wrote to you by letter telling you to get 80 dr. from Krissa who's staying with . . . on the mirror's account. I wrote that Epiktetos has my big silver ring, making a . . . weighing a stater of Ptolemaic silver, so that my might sell it. I sent you a message that Kornelis [Kornelios] the Goldsmith has my silver ring-key [or finger-key] of $\frac{2}{3}$ (? of a dr.) weight, to be sold. You have 2 bronze strainers, one new, one in medium condition, and a new cup [or pint-measure] and you have my white cloak and the white cloak of woollen felt and the self-coloured [undyed] trimmings and those made of Xoitic wool and the near-white ones, apart from the . . . , but the big walking stick which is under the . . . I



didn't write all this in the tablet, as I was going out, being unable to . . .[32]

A 2nd-century letter expresses delight at the recovery of a friend from illness. A goldsmith named Serenos has arrived and brought the news that "he is now free from fever. This is the good news we wished for."[33] A 5th-century letter shows a goldsmith occupied with various matters that have no connection with his craft:

To my truly beloved brother Aphyngios, from Ptolemaios of Takona. Since your Charity has pleased God, it's our Duty to laud your Honoured State, brother. Deign, if it be your Pleasure, to meet . . . the camel-driver until you speedily receive the articles sent to me by Isak: 2 pairs of loaves, 1 vessel of radish-oil holding 2 sextarii, 1 double jar of good vinegar, and 1 flagon of wine, 1 . . . , 1 . . . , 3 cheeses and $\frac{1}{2}$ a . . . , and 1 pair of [?] bellows, and . . . whatever the camel-driver gets from the said man, give me a complete account, what this is, so that the camel-driver may take it. I greet my Honoured Mother Kyra and all my friends. I could not . . . dispatch him, but with God's help I shall soon send you a present [?]. I pray for your health.

To my truly Beloved Brother Aphyngios Goldsmith from Ptolemaios of Takona.[34]

Naturally goldsmiths figure in many accounts. From the Ptolemaic period we may take an expense-account, perhaps made up on a journey, in which is recorded, as well as four copper drachmai offered to the sacred ibis, something "from Horos gold [smith] through Agathon". In a papyrus that seems to give a statement of banker's daily business goldsmiths appear, Semthis and Opos (several times) as well as "the goldsmiths of the town". An account of 21–20 B.C. of expenditure in copper has "to the priest of Thoēris, to Kephalas goldsmith", and so on. Payments in the early 4th century include as recipients a high priest, linen-dealer, women bakers, a goldsmith, stoker, dyer and bankers.[35]

A goldsmith who played a minor part in history was Aetios of Antioch in Koilē Syria, who founded the Anomoian form of Arianism. Left fatherless and penniless as a child, he became the slave of a vine-dresser's wife, then a wandering tinker or goldsmith. A scandal, or impulse of ambition led him to turn to medicine under a quack (some herbalist or the like?); and he set himself up at Antioch. The schools of medicine, having a materialist outlook, favoured the Arian heresy with its more rational theology—the Son seen as not mystically identical in substance

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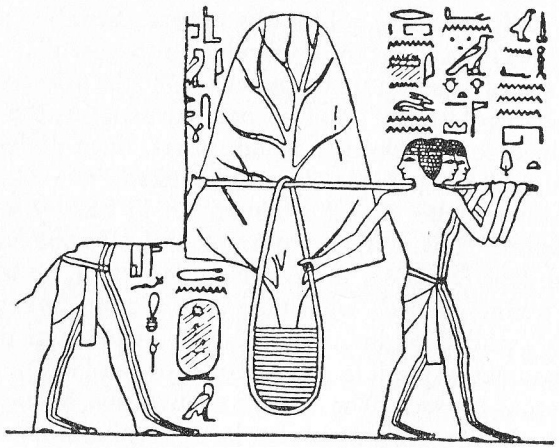
with the Father—and Aetios took up the Arian position with extreme fervour. He frequented the meetings of the physicians where theory was fiercely argued out, and became such a keen and expert debater that he was paid by less eloquent thinkers to set out their principles. After his mother's death he studied under an Arian bishop, but was driven out of Antioch to Anazarbos, where, about A.D. 331, he resumed his work as a goldsmith. A professor of grammar employed him as a servant, but dismissed him for publicly arguing for views that he, the professor, opposed. Again an Arian bishop took him up and he returned to Antioch, but was again driven out. This time (before A.D. 348) he went to Kilikia, where he debated with the Boborian Gnostics. Via Antioch he travelled now to Alexandreia, where he debated with the Manichee Aphthonios. Once again he took up medicine, giving his services free to the sick and earning his livelihood by goldsmith-work at night. His opponents, however, declared that his main occupation at the time was an irreverent application of logical figures and geometrical diagrams to the nature of God's Word. On a former master of his becoming bishop at Antioch, he went back there, but his enemies forced him out of his ordination as deacon (in which he was accepted only for teaching work).

The remainder of his career was on the same stormy and restless pattern. With the rise of Arianism he defended the sharpest and most explicit form of the heresy, at one time becoming bishop at Constantinople. During a period of exile at Amblada, in Pisidia,



28. Incense-trees imported from Punt



he composed what the orthodox described as 300 Blasphemies; and we know that he called his opponents Chronites (Temporals) with an apparent allusion to their courtly obsequiousness. Unfortunately we do not own any complete work of his and are dependent on the abuse of the orthodox for the account of his life and ideas. They attacked his morals; but his wickedness seems to have consisted in following various Gnostics in denying the need of fasting and self-mortification. While we cannot prove that his heretical positions were linked with his training as goldsmith and physician, the connection is likely and suggestive.[36]

Bronzesmiths were scattered often in small localities. A document of the late 3rd or early 4th century, drawn up by some official apparently with a view to exacting contributions from each of them, mentions Pasion bronzesmith, and then "in the village Tēis workshop of Ammonios with his sons and bronzesmith Euangelos". In the Byzantine period we find them on the big estates. Late 6th-century documents, probably of the Apion family, name Ioannes and Petros as *chalkeis*, and

> To Phib, smith, when working on the 6 irregatos outside the gate, on account of pay, 10 art. of corn by kank. measure, of which 5 art. were given through the cultivators outside the gate, remainder through us 5 art. by kank. measure, 5 art. by kank. measure.

Then we have a piece of yellow sandstone inscribed in Greek, which must have been let into the wall of a foundry; the date is perhaps 1 October 641. "With the Help of the One God to Appa Iosephios Bishop who Built this Bronze Foundry for the Holy Church in the Name of J. C. Amen in the Month Phaophi of the 4th Year of the Indiction." The term used for foundry *chalkeutikon ergasterion*, is not found elsewhere. At this time the Church had gained a very strong economic position, acquiring or building workshops of many kinds.[37]

In 316 we find a guild of ironsmiths at Oxythynchos gave a receipt to the authorities through their monthly president, Aurelios Severos son of Sarmates:

> I have received from Aurelios Agathoboulos son of Alexandros, banker in charge of the Public Receipts in the Official Bank of Oxyrhynchos in accordance with the Order of the said Most Estimable Logistes, the appointed sum which was to be ordered to be paid to us as the price of one hundred-weight of usable iron intended for public works of the City, namely 6 talants in full.[38]

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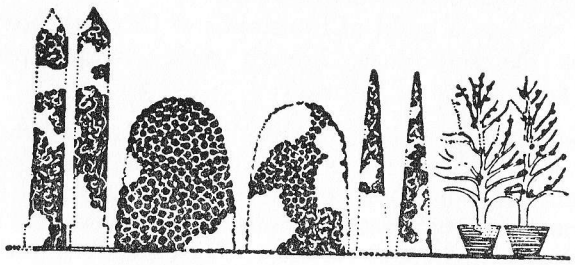
We may note that though the term *chalkeus* above is translated bronzesmith, in fact it was used for almost any kind of smith. The ironsmiths are called *siderochalkeis*, literally "ironbronzesmiths". Already, in the *Odyssey*, *chalkeus* is used of a goldsmith and/or an ironsmith. A lead-worker, Aurelios Pamouthios, in 579 stood as surety to the heirs of Flavios Apion that Aurelios Abraham, son of Herminos and Herais, who came from the estate Great Tarouthinos (also belonging to the heirs), would remain where he was, "together with his dear ones and wife and herds and all his possession". If Abraham defaulted and went off, Pamouthios, son of Georgios and Anniana, "coming from the City of Oxyrhynchos", would have to pay 8 gold solidi.[39]

Gems and semi-precious stones found in Egypt, included agate, amethyst, beryl, calcite, chalcedony, carnelian, garnet, haematite, jasper red and brown, peridot (from an island in the Red Sea), quartz, turquoise, sard, sardonyx, onyx, green felspar (amazonite, probably the stone called emerald, the gem itself being imported from India). The Stockholm Papyrus cites as materials used in making artificial gems and dyes: Cyprian and Galatian copper, Kappadokian salt, asphalt, Spanish tin, mercury, Kimolian earth, Makedonian *chrysokolla*, Knidian and Syrian *kokkos*, Pontic honey, Indian crystal, Armenian blue, asbestos, resin from Palestine or Tomoi, Pontic henna, indigo, Skythian bark, Phrygian stone, Sinopic earth, orpiment, litharge.[40]

In *The Paradise of the Holy Fathers*, which we have in a Syriac version, we hear how the Abba Makarios practised a holy fraud on a rich, unmarried woman of Alexandreia:

From his youth up he had been a skilful workman in the cutting of gems and he went to her and said, "Certain very precious emeralds and gems have fallen into my hands, and whether they have been



29. Heaps and cones of incense



stolen or not I do not know; their value cannot be ascertained, because they are above price, but the man who has them will sell them for five hundred dinars.[41]

The woman gave him the money, which he gave to the poor. Later she asked what he had done, and he took her to his house, where she saw the decrepit folk he kept.

Plinius remarks that to tell genuine from false gems was extremely difficult:

especially as we have discovered how to transfer genuine stones of one variety into false stones of another. For example, a sardonyx can be glued-up so convincingly by sticking three gems together that the artifice cannot be detected. A black stone is taken from one species, a white from another, and a vermilion-coloured stone from a third, all being excellent in their way. And further, there are treatises by authorities, which I at least shall not deign to mention by name, describing how by means of dyestuffs, emeralds and other transparent coloured gems are made from rock-crystal, or a sardonyx from a sard, and similarly all the other gemstones from one stone or another. And there is no other trickery that is practised against people more profitably.

This reference to books on tinctures suggests that alchemic or near-alchemic works were partly misunderstood. Plinius goes on to give some rules for testing gems. First, do it early, not later than 10 a.m., and then look for weight, coolness, and structure.

In artificial stones globules deep below the surface, rough particles on the surface itself, filaments, inconsistent lustre, and brightness that fails to strike the eye. The most effective test is to knock off a piece of the stone so that it can be baked on an iron plate; but dealers in precious stones do not unnaturally object to this, as likewise to testing with a file.[42]

Clement records an odd belief that had grown up about the cult-statue of Sarapis at Alexandreia, which had, in fact, been made under Ptolemaios I. The historian Athenodoros, he declares, wrote that:

Sesostris, the [legendary] Egyptian king, after subduing most of the nations of Greece, brought back to Egypt a number of skilled craftsmen. He therefore gave personal orders that a statue of Osiris his ancestor should be elaborately wrought at great cost; and the statue was made by the artist Bryaxis, not the famous Athinian but another of

the same name, who used a mixed and varied [*poikilos*] set of material in its construction. He had filings of gold, silver, bronze, iron, lead, and even tin; and not a single Egyptian stone was left out, there being bits of sapphire, haemetite, emerald, and topaz as well. After reducing them all to powder and mixing them, he stained the mixture dark blue, so that the statue's colour is nearly black and mingled the whole with the pigment left over from the funeral rites of Osiris and Apis. Thus he moulded Sarapis: whose very name implies this link with funeral rites and the construction out of burial material, Osirapis being a compound from Osiris and Apis.[43]

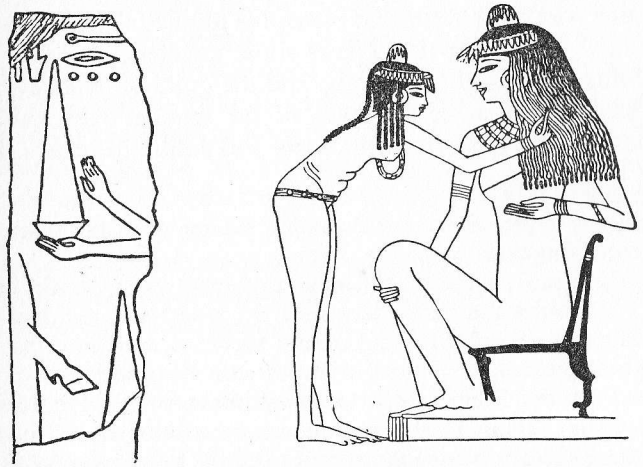
Here we meet the dyeing of metals and stones, the connection of this process with death-rebirth ritual, the notion that a cosmic god ought to be made up out of all the main metals (planetary systems), and the further notion that this god in his underworld or death-aspect should be black (like the primary matter of the alchemist).

The Empire exported both gems and false precious-stones to the east. At Virapatnam, the Roman-Indian emporium near Pondicherry, large numbers have been found, some made of glass, dating from the first half of the 1st century A.D. Accounts of Chinese embassies about 97, 220–64, and 420–78 refer to imitation-gems from Syria.[44] Records dealing with western contacts mention the Nightshining Stone, a Syrian product, and western sources tell of precious stones luminous in the dark: perhaps chlorophane, which, despite synonyms like pyrosmaragd, is not an emerald or beryl but a fluorspar, of which many varieties have strong phosphorescence and fluorescence on being heated or scratched in a dim light.[45] There may be a link with the Indian cobra-stone or *naga-kallu*, said to be used by cobras to attract fireflies and to lie behind the sacred jewel famous in Japan as *hoshi-no-tama*. The wealth of gold and jewels described in ancient and early medieval writings about the East Roman palaces and temples were, in fact, gilt copper and coloured glass.[46]

Fire-effects were used by the western jugglers taken home to China by the embassy of 120 to Shan (on the Burmese border). The jugglers performed before the emperor An on New Year's Day 121; they could "conjure, spit fire, bind and release their limbs without aid, interchange the heads of cows and horses, and dance cleverly with up to a thousand balls". Jugglers had already been mentioned in the Parthian missions of Chang Chhien's time, about 120 B.C.[47]



As for colouring materials, deposits of gypsum between Ismailia and the Red Sea, and along the Red Sea coast, were used mainly for making plaster; the Romans also taught the Egyptians how to use lime for this purpose; and both gypsum and lime were used for whiting. Near Syene and in the western oases red and yellow ochres were found; the yellow, calcined, becomes red, and no doubt both kinds were used in red paint. Ochre and sandaraca also came from Topazos, a Red Sea island; and the blue pigment called caeruleum that came from Egypt may have been azurite, found in the eastern deserts and Sinai, or an artificial fruit. Dyeing had been practised from predynastic days. The five



30. Cones of incense; lady and servant with cones

main dyes cited in the Leyden Papyrus X and the Stockholm Papyrus are archil (orchil), a purple got from certain sea-algae on rocks in the Mediterranean; alkanet, a red from the roots of the Alkanna tinctoria; madder, a red from the roots of the Rubia tinctorum and Rubia peregrina; kermes, a red from the dried body of a female insect found on an evergreen oak; and woad, got by fermenting the leaves of the Isatis-tinctoria. Woad was certainly grown in the Fayum from the Christian era, and probably earlier. In several documents of the 2nd century A.D. we find it prohibited as a crop, though no reason is given.[48] As a mordant or fixing agent, alum seems chiefly used. Plinius describes the method without naming the mordant:

After pressing the material, which is white at first, they saturate it, not with colours, but with mordants calculated to absorb colour. This done, the tissues, still apparently unchanged, are plunged into a cauldron of boiling dye and are taken out the next moment fully coloured. It is a singular fact too that though the dye in the pan is of one uniform colour, the material when taken out is of various colours, according to the nature of the mordants that have been respectively applied. These colours too will never wash out.[49]

He mentions also a secret method known to the Egyptians for bringing out the design on stuffs.

The industry of dyeing and fulling was closely connected with weaving. The bids or reports of fullers and dyers lack details, but some sort of government control is implied. The accounts of the temple at Soknopaiou Nesos show payment made for taxes on a fulling works at Neilopolis; and the guild of dyers evidently requested a cession of the lease of the temple.[50] Probably the temple held the lease from the State and sublet to others. In the 160s:

The Fullers Dyers from the Arsinoite Nome were summoned and appeared. Longeinos, advocate, stated:

"Of these men, some are fullers and others dyers by trade, and for the tax on trades the fullers pay 1092 dr. yearly and the dyers 1088 according to tariff and custom. A certain Maximos, appointed inspector, wrongly entered against them a larger sum than was due. So they appealed to the Prefect, who referred them to his Highness the Epistrategos Crassus. The latter summoned the Eklogistes of the Nome and ordered him to verify the accounts of the last twenty years, and,

31. Relief of Roman goldworker, *aurifer*



on his reporting that no more had been paid than was sanctioned by the tariff, decided that they should pay on this scale, and they have done so up to the present time. A superintendent of the tax on trades has now been appointed, who wants to demand from them a larger amount than that in the tariff, and they therefore petitioned the strategos, adding a statement . . . , but as nothing was done by the strategos, they were obliged to appeal to you."

Protarchos, advocate, said: ". . . in accordance with the decision of Crassus . . . a report on the subject was laid before his Highness Liberalis, who made an endorsement that they should be obliged to pay."

Severianos said, "When the Eklogistes is present . . ."[51]

In 172 an offer was made by Herōn to the ten superintendents of the leasing of the dyeing monopoly at Arsinoe for a rental of 300 drachmai. Heron, who lived in the quarter of the Temple of Sekneptynis, was to make himself responsible for other charges falling in on the lessee if he gained the right of superintending the weaving-business in Archelais village.[52] To the 2nd-3rd centuries belongs an order "to the head-policeman of Tarouthinou Epoikion: send Andromachos and Paous, weavers . . . at the petition of the collectors of the dyeing trade".[53]

In some abstracts of contracts of the late 2nd century we meet sales connected with a dyeing-shop:

. . . and the drains in vacant spaces to the west of the workshop, the use of ½ the above-cited being reserved for Epeus son of Sarapiōn, freedman of Demetrous daughter of Ploutarchos, of the said city [Oxyrhynchos], for his lifetime in accordance with the aforesaid will, and . . . at the workshop and drains. The adjacent areas are on the south land of the heirs of Damas, on the north land of Philoneikos, on the east a street, on the west a garden.

Sarapias and Aunchis, both daughters of Harthonis son of Paapis, and their mother Terathōnis, daughter of Zōilos son of Sarapiōn son of Petōousarapis, have sold the produce and roofs and dyeing-workshops jointly constructed, which belongs to them in the aforesaid dyeing-place, and the leaden pot and earthenware cask which they possess there, and further the vacant spaces they possess to the west of workshop.[54]

In a document of 381, Aurelios Ploutarchos of the village of Phobōou in the 5th Pagus or District of the Oxyrhynchite Nome made himself the guarantor of a loan made by a dyer Aurelios . . . son of Heraklas of the city to a friend of his, Philonikos, son of

Besammon. The loan was 4,200 myriads of denars of silver "on account of extra payments in accordance with the contracts if . . . made by me [Ploutarchos] in order that you [the dyer] may have security from me until the repayment of the sum".[55]

In a 6th century document a purple-dyer from Alexandreia hires out his services to two businessmen. Andreas and Petros, for a period of two years, during which he is to work at their premises. In return he is to get 11 solidi less 5 carats, with 92 carats as advance payment. His name is Aurelios Menas, son of the blessed Abramios.[56] In a document of 399, also from Hermopolis, we meet in a fragmentary petition to the *nyktostrategos* the name Aurelios Annan Iōsēs. Apparently the Jewish name "Annan" has been left unhellenised.[57] And about 570 the lessee of a shop, in the southern agora of Antinopolis below the dwelling-house of the lessor, was a Jew Peret who meant to turn the site into a dyeing-works at a monthly rent. The lease was determinable (as often at this time) at the lessor's will. Peret, son of Iouab and Rhosyne, paid $1\frac{3}{4}$ carats of gold at the end of each month. Previously the place had been a general store.[58]

In the Gnostic *Gospels of Philip* much use is made of imagery from the crafts. God is compared at length with a good dyer who blends his colours. The breath of the glass-blower blowing a vase is the simile for the *pneuma*. The destiny of men is linked with that of the ass turning a mill, walking miles and miles, but finding himself at the end, for all his pains, wretchedly where he started.[59]

We may complete this chapter with a glance at drugs, cosmetics and fermenting processes. The papyri have many lists of drugs and medicines, which need not, however, detain us. A document of 18 May 253, concerned with the registration of druggist's stock, shows how carefully such matters were controlled. Aurelios Neoptolemos, son of Dioskoros of Oxyrhynchos, was writing to three men, lessees of the monopoly of the alum industry:

> In accordance with the orders of Aelius Sabeinos the most excellent procurator of Hermes, I make a punctual return of the items which I have received from the previous lesees of the industry as listed below:
>
> *Alum* from Psobthis, $2\frac{1}{2}$ talants weight; and *split alum*, 30 mnai weight *Melanteria*, 12 tal. *Miltos*. 7 tal. *Misy*, 450 loaves [or pellets] . . . 5 tal. *Ochre* from the Oasis, 3 tal. *Salt*, 5 tal . . . , 5 tal . . . 2 measures. I have remitted the price of all these, in full, as is customary in accordance with the receipts I hold.[60]



The five items that survive in the text all have a medical use; four are also pigments, and the fifth is a mordant (alum). Deposits of alum and ochre were found in all the oases, but here we are referred to Psobthis, capital of the Little Oasis, from which alum was brought on camel-back to the Fayum. The alum monopoly there is well-attested. Camel-drivers paid a toll at the gate of town or village. In 145:

> Through the Bank of Sabeionos in the Treasuries Quarter. Ischyrion, son of Aphrodisios, and his fellow supervisors of the alum monopoly in the Arsinoite Nome, to Panouphis, son of Tesenouphis and of Stotoetis, of the village of Soknopaiou Nesos in the Division of Herakleides, Camel-Driver, stating that he has received, for the toll [paid to him] on the 30 light talants of alum which he transported from the Little Oasis to the Arsinoite Nome through the toll-gate of Nynpou, at the rate of 1 dr. 3 ob. per talant, 45 dr.
>
> And as the said quantity equals 12 metal talants, he has received for their transport, at the rate of 7 dr. 3 ob., 90 dr., making in all 135 dr. Ischyrion has received from the supervisors in the Little Oasis through the above-named camel-driver the 12 metal talants of alum . . . the customary $6\frac{1}{2}\%$.[61]

The $6\frac{1}{2}\%$ payment is obscure; in some cases the government deducted that amount for payments in advance, but that hardly seems the case here. The journey in question took 8 to 9 days by camel. From a document of 229 in which a superintendent (of the Prefect's Boats) writes to three ex-magistrates of Oxyrhynchos, who superintend the alum monopoly, we learn how many statements had to be made out. "The 6 five-day accounts of the alum monopoly, from the 1st to 5th of the month Thoth of the present year, which you have sent, 2 for the dept. of the Dioiketes, 1 for the Roman [?] Archives, 1 for the Nome's Procurator, 1 for his Bureau, 1 for the Oikonomos, were received by me on the 20th of the month and forwarded." We also have a letter, dated 300, from a lessee:

> Aurelios Makrobios, Lessee of the Administration of Alum, through me, Kaisarios, clerk, to Aurelios Isak, greeting. I have sent you 1 Italian lb. of alum through Isidōros, and 2 ounces 8 carats of nasturtium, powder. 16th, 15th, and 8th Year, Tybi 28.[62]

To judge from the connection with *kardamon*, the alum here was to be for medical use.

In early days drugs and medicines were closely connected with

cosmetics and incense: all were life-giving substances. Hence the world of the gods was depicted as drenched in perfumes and cosmetical elements; and scents and incense were offered up to them. In ancient Egypt the priest who supervised embalming had a name connected with the knowledge of herbs, *wt*. The Akkadian word for ointment is closely connected with the name of the priest who made up the incense offerings, with the word for anointing-oil and the vase holding it or the spatula distributing it. The word for aromatic herbs denotes also resins and gums, all substances oozing or filtering from the plants, and is related to words denoting samples, medical herbs, unguents or pastes. The Egyptian word for the gums, *kmjt*, became in Greek *kommi*, and ultimately our own *gum*.[63] Though the Egyptians had a word for smell, they always called perfumes "the fragrance of the gods".[64]

The smell of incense accompanied a god and made his presence known. This connection of the smell and the god's advent is brought out, for instance, in the legend of Queen Hatshepsut's begetting, birth, and education. So, in turn, perfumes helped to lure gods or luminous spirits (those of the just dead) or to repel evil spirits (those of the unjust dead). The dead (the spirits of the unjust) fled before the gods; they therefore also fled from incense. A captured town was fumigated to drive out the previous gods and bring in the Egyptian ones; and the maladies caused by evil spirits were cured by fumigation.[65] Thus in a lantern-rite the Ptolemaic magician evoked the gods:

> You will say the formula 7 times on the boy [medium]. So that he won't see the lantern, he has his eyes closed. Then you'll throw pure incense into the stove and put a finger on the boy's head with closed eyes. When you've done that, order him to open his eyes before the lantern and he'll see a god-shadow by the lantern.[66]

Bad smells repelled. Maladies caused by the gods might be cured by fumigating the sick man with unpleasant things. "Pound together honey, fresh olives, northern salt, piss of a menstruating woman, ass-shit, tomcat-shit, pig-shit, the plant *ewnek* . . . so as to make a compact mass and use for fumigation round the man." As places from which the gods have gone are opened up for daimons, the appearance of the latter can best be precluded by the concoction of stinks. Thus a magician evokes the spirit of a damned person by burning ass-shit in a cauldron. In evocations with the aid of a vase and a medium:



> How to spell a vase quickly so that the gods may come and tell you always the truth. Throw into the fire a crocodile's eggshell or what you find there: the vase will be at once spelled. How to force them to speak. Throw a frog's head into the stove and they'll speak. How to bring the gods with living force: Throw into the stove crocodile bile powdered with incense. To force them to come at once, throw into the stove a small anise-bough and the above-cited eggshell and you'll spell the vase at once. To fetch a living man, throw in blue vitriol and he'll come. To evoke a luminous spirit, throw in a large amulet with some crystal, and the luminous spirit will come. If you throw in the heart of a hyena or hare, it'd be very good.
>
> To evoke a drowned man, throw in a seacrab. To evoke a dead man, throw in some ass-dung and the amulet of Nephthys, and he'll come. To fetch a robber, throw in powdered saffron and alum. To make the gods come and the vase work quickly the spells, take a scarab, drown it in the milk of a black cow, and throw into the stove. The vase will be spelled at once and the light will appear. If you want anything whatever to go off, throw in monkey-shit and each will go to his place when you recite the formula of dismissal.
>
> Amulet recommended for binding on the body of him performing the magic with a vase's help, for quick spells. Take a band of 16 linen threads, 4 white, [4 green], 4 blue, 4 red. Knot it and water it with peewit blood. Then tie it to a scarab in its solar form, drowned enveloped in a purse of the finest weave, and tie it on the body of the boy who exercises the magic with a vase's help. Then he quickly creates spells, without hesitation.[67]

The method for making perfumes was probably some primitive form of distillation. Thus some tribes near the Nile sources macerate herbs in water, cover the vessels with strips of cloth steeped in grease or fat, then boil till all the scents, evaporating, have been fixed in the fat or grease, which can be scraped off. Such methods must have been used in very ancient times. But certainly flowers were steeped in layers of fat, being replaced as soon as their perfumes had been absorbed. We see the resulting pomades as balls or cones attached to the heads of people at merrymakings; they also provided a normal part of the make-up of an Egyptian lady. In maceration the flowers were dipped into fat or oils at about 65°C. and the mixture was strained off. Also, men learned to express the flowers or seeds. First they trod the materials in a tub, then used a simple press of linen-cloth twisted at either end by a stick. By the 3rd dynasty they had improved the device by replacing one of the sticks with a noose attached to one of two

uprights carrying the bag-press. No advance was made till the classical world invented the beam-press and the screw-press.[68]

Egyptian eye-paints were ground on a palette, the name of which seems connected with the word "to protect": not simply from disease, but in the religous-magical sense. The paints or their ingredients were often offered to the gods or were used on the divine statues; they are often mentioned with regard to the Eye of Horos. Till a late stage in Egyptian history it was usual to paint the upper eyelid black with galena, the lower green.[69] The Akkadian term for galena gave birth to the Arabic word *kohl*, which, from meaning a specific eyepaint, came to denote a finely divided powder, then a subtle spirit, and finally emerged as our alcohol. In Egypt the cheeks and lips were coloured with red ochre, often with a lipstick of reed holding a small piece of ochre at each end. The Sumerians seem to have preferred yellow ochre, sometimes called golden clay or face-bloom (the face as a flower).[70]

Incense in Egypt was the Fruit of the Gods; a later term seems linked with the word for peace and happiness. The Ptolemaic period saw the greatest expansion of varieties. By the 1st century A.D. the more costly kinds of incense were scarce, replaced by resins from coniferous trees or terebinth, which may have been the original incense used before the Pyramid Age.[71] Alexandreia was the great manufacturing centre for cosmetics and perfumes, outdistancing towns like Antiocheia or Laodikeia, let alone old Greek sites like Korinth or Chaironeia with its *krinos*-lily ointment. We must not, however forget, Mendes, the home of Bolos, which

32. Egyptian lady using powderpuff



was an important place for scent-production. Plinius, commenting on changes in fashion, says that the perfume of Delos had to make way for that of Mendes as that of Korinth for that of Kyzikos and so on. Athenaios remarks of henna, "the *metopion* and the Mendesian are made best in Egypt; the *metopion* is produced with the oil got from bitter almonds." Despite the pre-eminence of Alexandreia there was much local production of unguents and the like. A town such as Oxyrhynchos had its Street of the Ointment-Makers. For a while a manufacturing centre in Campania competed with Alexandreia. There was a guild of *unguentarii* at Pompeii, but Capua with its Seplasia Quarter was the main producer. We hear of various fakes, *e.g.* white drops interspersing the resin from pitchpine—"closely resembling frankincense, so that when mixed together they're indistinguishable to the eye; hence the adulteration practised in the Seplasia." This quarter also faked its medical wares. "Ready-made plasters and salves are now on the market, and deteriorated goods and the deliberate falsifications of the Seplasia find their way into the mortar." The Capuans thus ended by ruining their name and losing trade.[72]

Magical qualities were at times attributed to cosmetics. Thus, at Rome, the olive-oil mixed with dust and sweat scraped by strigils from the dirtied body of gladiators and athletes was collected and sold as *rhypos* for the manufacture of unguents, which were believed to confer something of the power and fascination of the fighters on the ladies.

In a passage where Philon sees the whole universe and its processes symbolised in scents, we are made to feel how close the cosmetical and the alchemic workers could be. Philon is dealing with *Exodus* xxx (34):

> And I imagine these four ingredients of which the whole perfume is composed are emblems of the four elements of which the whole world is made. He likens the *statkē* to water, the *onycha* to land, the *galbanon* to air, and the pure transparent frankincense to fire. For *staktē*, deriving its name from the drops [*stagones*] in which it falls, is liquid; and *onycha* is dry and earthlike; the sweetsmelling *galbanon* is added to give a representation of air, for there is fragrance in the air; and the transparency in frankincense serves to represent fire.
>
> On this account too he has separated the things with weight from those that are light, uniting the one class by a closely-connecting combination and bringing forth the other in a disunited form: as where he says, "Take to yourself sweet odours, *staktē*, *onycha*." These

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things, weighty, he mentions unconnectedly, as they are symbols of earth and water. But afterwards he starts afresh with the other class, which he cites in combination: "And the sweet spice of the *galbanon* and the transparent frankincense," as these again are in their nature emblems of the light things, air and fire.

And the harmonious composition and mixture of these things is truly his most ancient and most perfect holy work. That is, the Universe. Speaking of it under the emblem of perfume, he thinks it is bound to show gratitude to its creator. So that in name the composition carefully fabricated by the apothecary's art may be offered up—but in reality the whole world, created by divine wisdom, may be consecrated and dedicated, being a burnt offering of early morning and again of evening. For such a life as this becomes the world: continually and unceasingly to be giving thanks to its Father and Creator, so as to stop short of nothing but evaporating and reducing it into its original element, to show that it stores up and hides nothing, but dedicates itself wholly as a pious offering to the god who created it.[73]

The *Talmud* remarked that "the world cannot exist without a perfumer or a tanner."[74]

Behind all these processes, of metallurgy as of perfumery, there lay the work of the kitchen. An examination of Akkadian and Egyptian terms shows that many which originated from some operation concerning food were taken over by various craftsmen and applied to the operations of the unguent-cooker, the miner, the metallurgist, the dyer. Similarly kitchen-apparatus provided the basis on which alchemic apparatus were developed.[75]

An alchemic text, probably of the 3rd–4th centuries, states, "This Water acts like leaven, producing the like by the like. As the leaven of bread, little as it is, ferments a great quantity of dough, so also a little gold can ferment the whole dry matter." It seems that a leaf of gold was dissolved first in the water on this fermentative principle.[76]

Zosimos is said to have given a recipe for beer. The drying in the sun was no doubt meant to peel off the bitter husks:

Take well-selected fine barley, macerate it a day with water, then spread it for a day in a spot exposed to an air current. Then moisten the whole again for 5 hours and set in a handled vessel with its bottom pierced like a sieve. The rest must be ground up and a dough made with it after yeast is added, just as in breadmaking. Next the whole is put away in a warm place; and as soon as fermentation has set in enough, the mass is squeezed through a cloth of coarse wool or a fine sieve, and the sweet liquid is collected. But others put the parched loaves into a

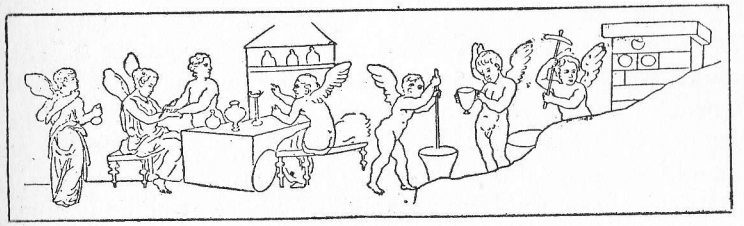


waterfilled vessel and subject this to some heating, but not enough to bring the water to a boil. Then they remove the vessel from the fire, pour its contents into a sieve, warm the fluid again, and then put it aside.[77]

We see there a primitive system of malting.

Finally we may cite a later text from Paracelsus, which finely brings out the way in which alchemy was bound up with all craft-techniques of transformation: "The baker is an alchemist when he bakes bread, the vinegrower when he make wine, the weaver when he makes cloth; therefore whatever grows in nature useful to man—whoever brings it to the point to which it was ordered by nature is an alchemist."

Now we may turn back to the alchemists. With Maria we find ourselves on comparatively solid ground.



33. Pompeian painting of loves as chemists

# 11

# Maria the Jewess

There is one other Egyptian alchemist who must be mentioned, though he is a somewhat shadowy figure: Chymes or Chemes, cited by Zosimos as an eminent author. Olympiodoros also mentions him a few times. His name seems to personify the art and he is made to take Parmenides as authority for the axioms: The All is One; by it the All is engendered; One is All and if the All did not contain everything it could not engender it. These axioms were written round magic circles and serpents with the figures of metals or plants in the middle. Zosimos associates Chymes with Maria, and it is possible he is of her period and school.[1] There is also a reference, in a text on Goldmaking, to Chyth, Orpheus, and Kleopatra, but Chyth may well be a copying error.[2]

We have noted how famous names are brought into the motley lists of alchemists, as also into spells, or else titles are added to familiar names. Petasios becomes King of Armenia; Kleopatra, the Queen of Egypt; Gebir among the Arabs, King of India. Alexander heads some Greek MSS; the emperor Heraklios is inserted, and we hear of "the Precepts of the Emperor Julian".[3] The Christians and the Jews brought in Biblical names. Moses naturally plays a considerable part. One MS opens: "And the Lord said to Moses, I have chosen by name Bezaleel, priest of the Tribe of Juda, to work gold, silver, copper, iron, all objects of stone, of wood, and to be the master of all the arts." The reference was to *Exodus* xxxi. This MS is perhaps the treatise elsewhere mentioned as *The Domestic Chemistry of Moses*.[4] We meet also a *diplosis*, or gold-doubling, of Moses:

> Copper of Kalais, 1 ounce, orpiment, native sulphur, 1 ounce, and native lead, 1 ounce, decomposed realgar [arsenic sulphide] 1 ounce. Boil in radish oil, with lead, 3 days. Put it in a roasting pan and set this on the coal till the sulphur is driven out, then take it off and you'll find your product. Of this copper take 1 part and 3 parts of gold. Melt it, fusing strongly, and, with God's help, you'll find it all changed to gold.[5]



The text is corrupt. The product would contain about 66% gold, 33% of an alloy of copper, lead, and arsenic, and in colour and resistance to chemical action would closely resemble pure gold. The alchemist might well think he had got gold by means of the gold-yellow colour of the orpiment. He would then argue that if gold could convert something like its own weight of copper and silver into gold, why should it not do the same to large quantities of base metals? While silver gives gold a greenish colour, and copper gives it a reddish one, the admixture of both copper and silver hardly alter the look. The alchemists though the gold acted as a seed which grew at the expense of the copper and silver till the whole mass became gold. He might have argued that a plant-seed drew on the earth around it and transformed it into a plant vastly larger than the seed.

In the Hermetic text XIII, Tat is given his instruction by Hermes "upon the Mountain"—suggesting both the Sinai of Moses and the mystery-mountains of Zoroastrian revelation. Magical and astrologic spells are attributed to Moses in the Leyden papyri; and in a demotic spellbook he is brought oddly into a charm to gain a woman's love:

> My heart languishes, my heart loves. As a she-cat sighs after a tomcat, as a shewolf sighs after a wolf, as a bitch sighs after a dog, as the son of Sopdet sighs after Moses coming to the walls of Ninaret [Os] to offer up water to his god, to his supreme master, to his Yaho, Sabaho, to his Glemora, Moses, Plerobe, Su, Mio, Abrasaks, Senklau, so N daughter of N sighs after N son of N.[6]

Solomon appears especially in exorcisms; his Labyrinth is drawn in a couple of alchemic MSS.[7] Zosimos refers to Judaic writings, some going back, he says, to Noah; he also mentions the translation of the Bible into Greek and Egyptian, attributing the work to a single person—an old erroneous idea. A recipe is assigned to Oseas King of Israel; and other texts gave the names of Abraham, Isaac, Jacob, Sabaoth, and so on.[8]

The hope of understanding and controlling material process was seen as the struggle to bring about the regeneration of matter, which in turn was indissolubly linked with the struggle to rise above the realm of necessity (slavery) into the freedom of true

human integration. The realm of necessity was above all regarded as the realm of mechanics, of mathematically determined laws, of the planetary systems considered to rule the lives of men in all details large or small. The realm of necessity was identified with the realm of the body, an organism controlled by a deterministic mechanism; the realm of freedom was variously taken as that of pure thought, abstract thought on Platonic lines; that of philosophic escape into regions felt emotionally to lie beyond the deterministic mechanism; and that of alchemic transformation into levels of qualitatively higher organisation. Only the alchemic way sought both to lay hold of reality and to change it. It took in both the aspiration to generalised and philosophic thought, and the passionate emotional desire to transcend the existent world in its totality; but it linked these aspirations and desires with the effort to understand and change the concrete world of process. Its one close affinity was thus, as we noted before, with the religious mass-movements that had a powerful element of social and political discontent underlying their formulations, and which looked to some kind of social reversal ("last shall be first", day of judgment, millennary peace and plenty) even if there was little awareness of the link except perhaps in some broad simple ways.

We can illustrate these points and at the same time show how Jewish and Iranian elements mingled with Greek in the images and ideas that most deeply moved men at this time. Thus we may take some connected prayers from magical papyri. In the Judaising version, the oldest of those in question, we find the sketch of an archaic gnosticism. It is a prayer for salvation (of the kind called a *stēlē*) and seems to derive from a yet more important secret work (now lost). Its liturgical form suggests an association with the cult of Seth-Typhon, in which all sorts of mysteries were celebrated. The reciter identifies himself with Man, "the most beautiful creation of the god who is in heaven": Man, who is "made of spirit, of dew, and of earth"—that is, Adam. Man longs to escape from the rule of Fate and to return to the original form from which he has fallen. The god invoked is the Propator or All-father, the Aion dwelling in the zenith of heaven. He is called Master of the Pole enthroned on the constellation of the Chariot: that is, he is the Biblical Sabaoth on his throne and in his chariot. He is served by myriads of angels and nearby at his side is the *aion* Sophia, Wisdom. Adam is here proclaiming that he knows the divine name of Salvation from the Demon of the Air and from Fate.



Two more obscure texts have the same basis: the Greek magical papyrus Mimaut, where a prayer to Helios is phrased as if spoken by Adam, and a Greek formulary (often called the Mithraic Liturgy) where the being from whose mouth comes the incantations is a Perfect Body made by the right hand of deity: that is, he is Adam. Born of an impure womb, he laments and hopes that psychic power will be restored when the Fatality dispensed by the spheres is wiped out.[9] The alchemists took over the symbol of Adam for the knowledge which liberates man and gives him mastery over living process. Zosimos and Olympiodoros see Adam as the Universal Man, who is identified with Hermes-Thoth. The four letters of his name—that there were only three in Hebrew was unknown—represent the four elements. Olympiodoros calls Adam virgin earth, igneous earth, carnal earth, and sanguineous earth. Eve was assimilated to Pandora, with Prometheus and Epimetheus taken to represent soul and body. In the *Geponika*, a recipe for keeping serpents out of pigeon-houses, attributed to Demokritos, advises the writing of the name of Adam on the four corners.[10]

Maria the Jewess belongs to the earlier alchemic traditions. She probably existed not very long after Bolos, and was much cited by Zosimos and other later writers. Zosimos knew her as Maria or Miriam, the sister of Moses; and we must not forget the role of Mary, mother of Jesus, in Gnostic evangels. But though there was the usual tendency to turn early alchemists into mythical figures, there is no reason why Maria should not have been an historical person with that name—just as Kleopatra may also have been, despite the inevitable identification with the great Queen. Maria and Kleopatra were common enough names. Though Maria's writings survive only in quotations, she stands out as a very definite character, indeed the first alchemist without any of the indeterminate elements that surround Demokritos-Bolos, Ostanes, Hermes. She was highly inventive and deeply interested in chemical experiments and in the instruments that made them effective and precise. She elaborated all the essential appliance on which alchemy or chemistry was to carry on for near two millennia: *kerotakis*, hot-ash bath, dung-bed, water-bath. And she seems to have perfected the apparatus for distilling liquids. She described her methods of construction in much detail, even to the point of telling how to make copper tubes from sheet metal. She

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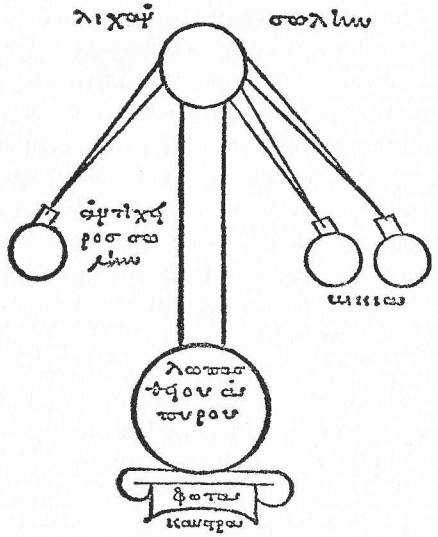
seems to have varied her experiments a great deal, but to have been specially absorbed in alloys of copper and lead. She speaks of Our Lead as distinct from common lead, perhaps meaning antimony or some metallic sulphide. Like Hermes and Agathodaimon, she is credited with the aphorism, "Unless you strip bodies of the corporeal state, you will not advance"—that is, unless you take the metallic state from metals.



34. The three-armed still of Maria the Jewess

The alchemists seem to have been the first investigators of distillation. At times some sort of sublimation of liquids had been attempted, *e.g.* seawater had been heated in a covered cauldron, then the drops condensed on the lid were shaken off and used as drinking water. Also oil-of-pitch was made by heating pitch and condensing the vapour on fleeces; and mercury was produced by heating cinnabar on an iron saucer in a pan covered by a pot called *ambix*, on which the mercury vapour condensed. But none of these crude devices was truly a still or an alembic, which consists of three parts: the vessel in which the material is heated, a cool part for condensing the vapour, a receiver. Maria describes the still and seems to have invented it. The *balneum Mariae* or *baine-marie* seems first used as a name by Arnald of Villanova in the 14th century. Zosimos cites Maria's account:



I'll describe the *tribikos* to you. For so is called the apparatus made of copper and set out by Maria, the transmitter of the art. She says as follows:

Make three tubes of ductile copper a little thicker than that of a pastrycook's copper frying-pan. Their length should be about a cubit and a half. Make three such tubes and also make a tube of a handsbreadth width and an opening proportioned to that of the still-head. The three tubes should have their openings adapted like a nail to the neck of a light receiver, so that they have the thumb-tube and the two finger-tubes joined laterally on either hand. Towards the bottom of the stillhead are three holes adjusted to the tubes; and when these are fitted, they are soldered in place—the one above receiving the vapour in a different fashion. Then, setting the stillhead on the earthenware pan containing the sulphur, and luting the joints with flourpaste, place at the tube-ends glass flasks, large and strong so that they won't break with the heat coming from the water in the middle. Here is the figure.[11]

Our manuscript dates from 700 years after Zosimos wrote, so that the drawing has become rather schematised during its repetitions; but it is still recognisable as based on the original illustration by Maria. The standard type of still was described by Synesios, commenting on a work by Demokritos:

What he [Demokritos] says, Dioskoros, is as follows . . . And put it into a flask on the hot-ash bed, not over a direct fire but on a gentle hot-ash bed, which is a *kerotakis*. During the action of the heat there is adapted, to the flask above, a glass apparatus with a *mastarion* [breast-shaped cup] fitting on to it. And put it on top of it, and receive the water that comes up through the breast and keep it and putrefy it. This is called Divine Water.[12]

Zosimos describes another type of still that remained popular till the 18th century and was called a Cold Still, as the liquid in the body was not boiled but only gently warmed. Recall Hermes' Heat of the Brooding Bird.

We can construct a series to show the development of the still. First came a simple condensation of seawater on a pot-lid as mentioned above: there is a description of the method by Alexandros of Aphrodisias, a commentator on Aristotle. Then the mercury was condensed in a flask-like vessel turned upside-down; there is a description by Dioskorides. Then, probably, the lid was turned in to provide a container for the distillate. The next and crucial step was the addition of a pipe to lead the distillate off. But such

a pipe was liable to cause trouble if the liquid boiled up quickly, right over the still-head. So Maria put in the wide vertical tube between boiling-pan and still-head. Demokritos got something of the same effect by using a long-necked flask; and Zosimos, who didn't want to boil liquids, kept to the old type.[13]

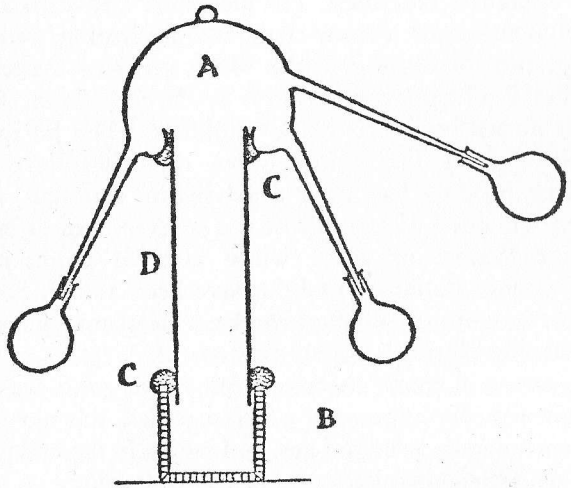
In all, some 80 pieces of apparatus are known: furnaces, lamps, water-baths, ash-baths, dung-beds, reverberatory furnaces, scorifying pans, crucibles, dishes, beakers, jars, flasks, phials, pestles and mortars, filters, strainers, ladles, string-rods, stills, sublimatories, all make their first known appearance as laboratory apparatus in the workshops of the alchemists; and they have persisted, in variously modified forms, up till today.

There was a reflux apparatus for treating metals with vapours. The most important of this type was called the *kerotakis*, meaning an artist's palette. An artist painted with a mixture of pigments and melted wax, and he had to keep his colours on the *kerotakis*, a metal sheet shaped like a bricklayer's trowel, which was kept hot over a pot of charcoal. The alchemist no doubt took over the palette in his attempts to soften metals and impregnate them with colours—just as the artist softened his wax and mixed it up with the colours, which were thus given a new quality of permanence and used to create earthly forms in a new dimension, that of the picture. First the alchemist tried to adapt the *kerotakis* for the treatment of metals by means of heated vapours. A vessel below the *kerotakis* held a vaporised substance capable of attacking metals, while an inverted cup, set over the sheet, condensed the vapour into a liquid which flowed back. (The reflux extractor is the closed modern analogy.) Then came attempts to refine and elaborate the heating and condensing systems, and to use some kind of grating or strainer—perhaps to stop solid fragments of metal from dropping back into the base.[14]

The MSS give us no clear account of how the *kerotakis* was used. It has been suggested that something like the following occurred. The alchemist took sulphur (sometimes mixed with arsenic sulphides) and put it in the lower part, while the *kerotakis* proper held the metal to be treated: copper and perhaps some gold and silver too. The covers were then luted on, with a small hole left for the escape of heated air. A small cup was put over the hole. The alchemist then started off his fire. The vapour of sulphur made its attack on the metal. The resulting sulphide dissolved in, or mixed with, the excess of liquid sulphur and ran through the



sieve or grating back into the lower part or Hades. The black mixture of sulphur and sulphides remaining there was the scoria or black lead. The alchemist desulphurised it by heating or by treating it with lime or oil-of-nitre, and then smelted it. What emerged was an alloy of the original metals, doubtless with the addition of some sulphur and arsenic (if arsenic was present in the attacking vapours). *Kadmia* or arsenic (the Etesian Stone) seem brought in at some stage. During the gentle roasting and smelting that followed, the *kadmia* perhaps added zinc to the alloy and thus created a sort of brass or latten containing copper, lead, zinc. The alloy thus thus produced was at times used in gold-doubling.




35. Reconstruction of the three-armed still

All this may seem, it has been pointed out, a very complicated way of preparing an alloy. But we must remember that with his limited means of testing and his almost total lack of quantitative methods for assessing and determining what happened at each phase of his operations, the alchemist had very little hope of eliminating chance factors, unnecessary factors, and working out just what were the essential factors for bringing about the desired results. He could not be precise as to what composition he had achieved. His aim throughout was to change the colour of metals in a certain direction; and even when he did something that was successful or seemed to be, he had no clear method for

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deciding just what substances or processes had brought the result about. He could no doubt repeat experiments and get rid of certain obviously unimportant factors, but he was unable to grasp the pattern of the process in a truly concise and adequate way. And the inability to grasp and define the pattern thus in any one experiment meant in turn that he could not effectively correlate one experiment with another and build up a coherent body of chemical knowledge. He had to content himself with endless drudgery of inconclusive results and marvellous moments when he seemed to have stumbled on the pure secret of transformation.

Some operations on the *kerotakis* were yet more complicated than the operation described. The alchemist strove to achieve a series of continuous colour-changes, blackening, whitening, yellowing, and then rising to the violet glow of matter-in-the-highest. Perhaps he got his blackness by the conversion of copper and other metals into their black sulphides. Then he smelted it into a yellow metal. The whitening was doubtless more difficult. If the black product had been dried before smelting, it might have been whitened as a result of the efflorescence of salts from the Divine Water; or some white material (compounds of mercury, arsenic, antimony) might have been added. Some final tincture or a cleaning of the produced metal may have begotten the *iōsis*. But all this is largely guesswork.[15]

In any event it seems to have been Maria who was mainly responsible for the apparatus which enabled the alchemist to produce such results as he did get, and which in the end provided the basis on which chemistry proper could develop.

She seems to have had a strong conviction of the unitary nature of process. We saw earlier how the *Kitab al-Habib* thus described her.[16] Ibn Umail attributes to her imagery of the above-and-below type, which accords with her interest in the processes of the still or the alembic. These processes were seen as the movement up and down of vapours and water; condensation was a kind of rain, bringing down the water in a purified form from the heavens.

The Strength of the Lowest and the Highest—as Hermes the Crown of the Sages, has said to us—has passed into that Water, and consequently it will not leave that which has been dissolved in it in darkness, the water reviving the dust like the rainbearing cloud . . .

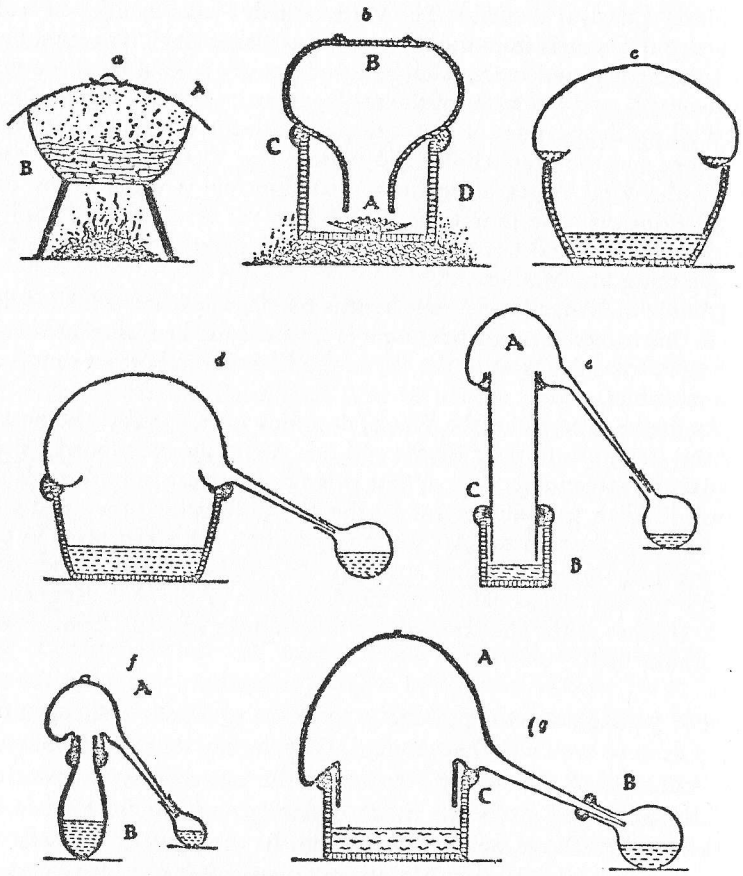


Maria [Mariya] also said: The Water which I have mentioned is an Angel and descends from the sky and the earth accepts it on account of its [the earth's] moistness. The water of the sky is held by the water of the earth, and the water of the earth acts as its servant, and its Sand [serves] for the purpose of honouring it. Both the waters are gathered together and the Water holds the Water. The Vital Principle [*Kiyan*] holds the Vital Principle, and the Vital Principle is whitened by the Vital Principle. She meant the Coction of the Soul with the Spirit until both mix and are thoroughly cooked together and become a single thing like Marble. . . .

[As for the Angel] she meant by this the Divine Water which is the Soul. She named it Angel because it is spiritual and because that Water has risen from the earth to the sky of the *Birba* [from bottom to top of the Alembic].

As for her statement [the Water] descends from the sky, she meant by this its return to their Earth; and this Angel she mentioned I shall explain to you another way so that you may be aware of both explanations, if Allah will. She meant by this the Child which they said will be born for them in the Air while Conception has taken place in the Lower [region]—this being through the Higher Celestial Strength which the Water has gained by its absorption of the Air. Regarding this, Hermes said: The strength of the Highest and the Lowest will be found in it.[17]

These passages seem genuinely to refer to Maria's theory, for they fit in so well with her devices. We may say that she developed the conception set out by Hermes of the macrocosm-microcosm relationship and gave it a more dynamic and concrete basis by linking the above-below system with the actual process of alchemy in a direct way. We cannot prove that she also worked out the analogy of mating and childbirth as expression of the triadic formula; but it is quite possible that she did so. We perhaps see her woman's-interests in her use of cooking imagery, her comparison of the still-tube's thickness with that of a pastry-cook's copper frying-pan, and her use of flour paste for luting. It would be in character for her to use the sexual metaphor for the fusion of substances. That metaphor did exist among the Greek alchemists, though not in such an expanded form as among the Arabs and the medieval alchemists of the West. In a work attributed to John the Archpriest, but actually consisting of excerpts from Zosimos, we meet the analogy of the alchemical process to the conception and birth of a child.[18] The imagery of the water reviving the dust is closely paralleled by passages in




36. Stages in the evolution of the still

Kleopatra's *Dialogue*: "how the highest descends to the lowest . . . how the blessed waters descend from on high to visit the dead . . . afflicted in darkness and shade . . . The cloud sustains them . . . and the cloud waters the plant." Here the imagery becomes that of the Osirian Resurrection. Ibn Umail has said further: "They name this Water also the Rain that revives the Lower World, and [by] all this [is to be understood] the Pure Silvery Water which is the Gold of the Sages. The excellent master Hermes named it the God with Many Names."[19] Indeed in view of the certain closeness of these passages from the Ibn Umail with Greek thought, we may take also the following:



In this water will be found the strength of the Highest and the Lowest. As Hermes, the excellent sage who is the Ocean of Wisdom, said:

Give it predominance over the Highest and the Lowest. It will then perform wonders—the thing and its opposite—because it will both blacken and whiten. It will also redden. It will harden the Moist and soften the Dry. Its brother is the Ash which has been extracted from the Ash with their Second White Body, which they named the Sanctified Thirsty Earth; and the Ash, which is the Ferment, they named the Ferment of Gold. The Gold is their Divine Water; and the Divine Water is the Ferment of the Bodies; and the Bodies are their Earth. The Ferment of the Divine Water, which is the Ferment of the Bodies, is the Ash and it is the Ferment of Ferments.

Maria the Sage, in several places in her books, named it the Rennet, because it coagulates their Water in their Second Earth, which is their Second Body. It is the Crown of Victory; and they called it Gold on account of its excessive whiteness, in connection with the expression: "their Water in their Second Earth, and their Silvery Water". They meant by their words "Mix Gold with Gold" the admixture of Water and Ash, and their Water and the Second Whitening Body.

Hermes said: O my Son, cultivate Gold in a White Silvery Earth.

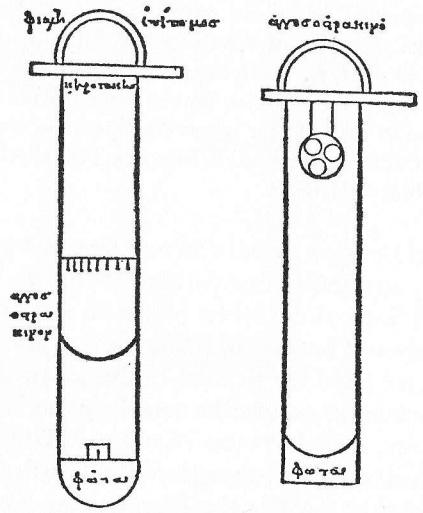
Hermes here called their White Water Gold because the Tincturing Soul is concealed in their Water when the Spirit becomes predominant over it by reason of its Colour and Whiteness. He called their Whitening Body, White Silvery Earth.[20]

The Alchemical Lexikon gives: "Silvery stream, vapour of sulphur and mercury"; and the phrase Silvery Water or Water of Silver is found in at least four other places in Greek texts. As for the comment about "becoming a single thing like Marble" in the previous text, we have the parallel in Demokritos-Bolos: "If the medicine becomes somewhat like marble, great is the mystery."[21] Rennet, however, does not seem to occur in Greek writings, nor does White Silvery Earth—though White Earth is often found.

We may add that a Maria the Egyptian or Kopt is also mentioned. A Book attributed to Ostanes tells how the philosophers, having seen a mysterious stone with an admirable colour, could not make out what it was, and so made a search all over the world to find the mine from which it came, but could learn nothing. Then they wrote to Maria to tell her of the wonderful colour and substance of the stone, about which they had inquired in vain. They added that the characteristics of this stone were that it was soft to the touch and shone in darkness. They begged her to tell them what it was if she knew. She replied that her predecessors

in the great work had been of the opinion that this stone came from a mountain in the midst of the sea and that it shone from the bottom of abysses like a torch in a dark night. We are also told that Maria wrote to Ostanes to ask his advice on certain matters and that he replied.

Whether there was any such Maria or whether she was merely an invention of the Egyptian school, meant to outshine Maria the Jewess, we have no idea. Probably she was a mere propagandist fiction. The second passage, however, makes her subsidiary to the Iranian school. The confusion is made yet more obscure by the fact that an Arab treatise (known in a Latin version under the name of *Calid and Morienus*) attributes to Maria the discourse with the philosophers that Kleopatra pronounces in the Greek text, and that the *Fihrist* refers to the *Book of Maria the Kopt with the Sages*.[22]



37. Kerotakis or reflux apparatus, as shown in a Greek MS

# 12

# Kleopatra

THE alchemist Kleopatra seems associated with the school of Maria. We have under her name an important sheet with diagrams and a *Dialogue*. As we noted, she was linked with the famous Queen Kleopatra, to whom the Arab writer Ibn-Wahs-Chijjah attributed a book on poisons and to whom the Romans gave a book on cosmetics. From Aetios we can recover some fragments of the latter work, for instance the recipe for a *smēgna* or unguent.[1] There is indeed nothing improbable about the Queen being connected with a work on cosmetics; and as the manufacture of cosmetics and perfumes contributed to the working-out of alchemic methods, there may thus be a slight link between her and the art. The practical aspect of Kleopatra the alchemist appears in the assignment to her of a work on weights and measures.

In the school of Kleopatra and Maria we find Komarios, by whom we have a fragmentary thesis. He was called high priest, philosopher, and teacher of Kleopatra.[2] Her contact with him seems like that of Isis with Amnael or Thessalios with Asklepios: a revelatory initiation. For he is described as seated on a throne and she learns from him the doctrine she transmits to later philosophers. His name is possibly derived from the Aramaic Komar, high priest.[3] Indeed the *Dialogue* may be a translation from the Syriac into Greek.[4] However that may be, it is a work of the utmost interest for the understanding of alchemic ideas and images.

First, however, the single page called her Goldmaking. The title is at the top. Three concentric circles enclose axioms. In the first ring we read: "One is the All and by it the All and in it the All and if it does not contain the All it is nothing." In the inner ring: "The Serpent is One, he who has the Venom with two Compositions", *synthemata*.[5] That is, the effective force comes

from the unity achieved out of the fusion of two opposites. In the centre are the signs of mercury, silver and gold; the rayed sun-sign is that found also in Assyria and in the heretical Valentinian writings. Below on the left is the serpent Ouroboros making a circle with his tail in his mouth and enclosing the axiom, "One the All". On the right is an alembic with two points; on its furnace is the word *phota*, flames, lights.[6]

Here we see clearly combined the Hermetic doctrine of unity, the Marian stress on experimental work and on the alembic in particular, and the triadic formula of what constitutes development. The *Dialogue* of Kleopatra is in tone close to the passages attributed to Maria and Hermes by Ibn Umail. The imagery of the waters reviving the dead is very Egyptian:

Then Kleopatra said to the Philosophers, "Look at the nature of plants, what they come from. Some come down from the mountains and grow out of the earth, and some grow up from the valleys and some come from the plains. But look how they develop. For it is at certain seasons of the year you must gather them; and you take them from the islands of the sea and from the most lofty place. And look at the air that ministers to them, and the nourishment circling round them, so that they may not perish or die. Look at the divine water that gives them drink, and the air that governs them after they have been given a body in a single being."

Ostanes and those with him answered Kleopatra. "In you is hidden a strange and terrible mystery. Enlighten us, throwing your light on the elements. Tell us how the highest descends to the lowest, and how the lowest rises to the highest, and is united with it, and what is the element that accomplishes these things. And tell us how the blessed waters visit the corpses lying in Hades fettered and afflicted in darkness, and how the Medicine of Life reaches them and rouses them as if woken by their possessors from sleep; and how the new waters, both brought forth on the bier and coming after the light penetrates them at the beginning of their prostration and how the cloud supporting the waters rises from the sea."

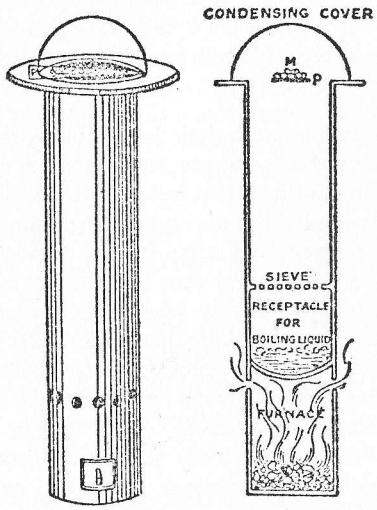
And the Philosophers, pondering what had been revealed to them, rejoiced.

Kleopatra said to them, "The waters, when they come, awake the bodies and the spirits that are imprisoned and weak. For they again undergo oppression and are enclosed in Hades, and yet in a little while they grow and rise up and put on various glorious colours like the flowers in spring and the spring itself rejoices and is glad at the beauty they wear.

"For I tell this to you who are wise. When you take plants, elements,



and stones from their places, they appear to you to be mature. But they are not mature till the fire has tested them. When they are clad in the glory from the fire and the shining colour of it, then rather will appear their hidden glory, their sought-for beauty, being transformed to the divine state of fusion. For they are nourished in the fire and the embryo grows little by little nourished in its mother's womb; and when the appointed month comes near is not held back from coming out. Such is the procedure of this worthy art. The waves and surges one after another in Hades wound them in the tomb where they lie. When the tomb is opened, they come out from Hades as the babe from the womb."[7]




38. Reconstruction of Kerotakis (M=Metals; P=Palette)

The whole background of this passage is essentially Egyptian. The imagery of the dead lying in their underground caves and waiting for the waters of resurrection had immemorial roots in Egypt. If we look at some of the ancient Pyramid texts we seem to be very close in idiom to the alchemic works though the earlier phrases refer wholly to the personal immortalisation of the Pharaoh in a cosmogonic situation. Note how in the following passage the waters are both those of the reviving Nile and those from the divine father's penis, the mother's vulva, so that the fusion of natural and sexual imagery in Kleopatra's parable is exactly paralleled:

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The waters of life which are in the sky, the waters of life which are in the earth come. The sky burns for you, the earth trembles for you, before the birth of the god. The mountains divide, a god comes into being, the god has power over his body. The two mountains divide, N comes into being, N has power over his body.

Behold N, his feet shall be kissed by the pure waters which come into being through Atum, which the penis of Shu makes, which the vulva of Tefnut brings into being. They have come to you, they have brought you the pure waters which issue from their Father. They purify you, they fumigate you, N, with incense.

You lift up the sky with your hand. You tread down the earth with your foot.[8]

Kleopatra continues with her metaphor of the womb and then carries on with her exposition:

The philosophers contemplate their beautiful work, just as a loving mother does the baby she has borne, and then they seek how they may nourish it, just as the mother does her infant. But for this art they use the Waters instead of milk. The art imitates the infant, since it is formed just as the baby is formed, and when it shall be brought to perfection in all things, behold the mystery that is sealed up inside.

But now I will tell you clearly where the elements and plants are found, and I'll begin by speaking in riddles. Go up to the highest point in the rugged mountain among the trees, and look, there is a rock in the mountain-ridge. From this rock take arsenic and use it for the divine process of whitening. And look, in the middle of the mountain, below the male there lies the mate with whom he is united and in whom he delights; for nature rejoices in nature, and without her there is no union.

Then go down to the Egyptian sea and bring up with you from its source in the sand the substance called nitron and unite it with the other things, and it brings forth the all-tingling beauty, and without it there is no union for the mate in due measure. See how nature corresponds with nature, and when you gather together all things in equal measure, then natures conquer natures and delight in one another.

See, you wise men, and understand. See the fulfilment of the art in the joining-together of the bride and bridegroom and in their becoming one. See the plants and their different kinds. See, I speak to you all the truth and again I'll say to you: See and understand that the clouds, which bear aloft the blessed Water, come up from the sea; and they water the lands and cause the seeds and flowers to grow. In the same way our Cloud, coming forth from our Element, bears on high the divine Waters and gives drink to the Plants and Elements, and needs nothing from other earths.



Again we note how much more vivid is Kleopatra's writing than most alchemic texts. Though she treats nature symbolically, we feel that she has her eye on it and loves it:

See, my brothers, the incredible mystery that is entirely unknown. See, the truth has been revealed to you. See how you water your earths and how you nourish your seeds, so that you may cause the fruit to be borne in its season. Hear then and understand and inquire closely into what I say.

Take from the four elements the arsenic which is highest and lowest, the white and the red, the male and female in equal balance, so that they may be joined to one another. For just as the bird warms her eggs with her heat and brings them to their appointed term, so yourselves warm your composition and bring it to its appointed term. And when you've borne it out and caused it to drink of the divine Waters in the Sun and in heated places, cook it upon a gentle fire with virginal milk, keeping it from the smoke. Then shut the ingredients up in Hades and stir carefully until the preparation becomes thicker and does not run from the fire. Then remove it from the fire; and when the soul and spirit are unified and become one, project upon the body of silver and you will have gold such as the treasuries of kings do not contain.

Hades, the underworld of the dead, is the lower part of the apparatus in question. We shall later explore the symbolism of the alchemic apparatus. Kleopatra goes on to describe the processes of transformation as a resurrection from Hades, from the blackness of the lowest forms of matter:

See the mystery of the philosophers which our fathers swore to you not to reveal or publish. It has a divine Form and a divine Activity. For that is divine which, by union with divinity, renders substances divine. In it the spirit acquires a body and mortal things a soul and by receiving the spirit which escapes from the ingredients they are overpowered and overpower one another. For the spirit, full of vanity and frailty of heart, overpowers bodies so that they are not whitened and do not receive the beauty and colour with which they are endowed by the creator. For the body and the spirit and the soul are weakened through the darkness that extends over them.

The divine, in this idiom, is not an abstract quality, something outside existence; it is simply the very quick of life, the element of qualitative change and of transformative leaps which cannot be reduced to any mechanistic formula; it is present in all things insofar as they possess qualities and organisational cohesions of

their distinctive own. The alchemist seeks to grasp the laws, the dynamic and dialectical systems, at work in the living processes of change and development; and it is because he gains only baffled glimpses, despite his conviction of having found the essential clues, that he feels a darkness clogging and obscuring the free and clear movement that he intuits and seeks to reproduce. Identifying, as he does, his own mental and emotional processes with those of nature, he feels his own confusions, difficulties, and uncertainties reflected in the behaviour of the substances he treats.

But when the spirit of darkness and of foul smell is rejected, so that no stench and no shadow of darkness appears, then the body is clothed with light, and the soul and the spirit rejoice at darkness put in flight from the body. And the soul, calling to the body now full of light, cries out, "Awaken from Hades! Rise up from the tomb and rouse yourself from darkness! For you have clothed yourself with spirituality and divinity, since the voice of the resurrection has sounded and the *pharmakon* of life has entered into you!"

Such statements must not be read with the modern connotation of the words. Just as the divine is the life-force, the spirit is *pneuma*, a material substance or force, which is merely subtler, freer, more volatile than matter in the ordinary sense. Above all, *pneuma* is that in each individual which links his share of the life-force with its universal flow and gives him fellowship with all things inside the system of complex correspondences and affinities. The resurrection that the alchemist seeks in himself and in his materials is not a disappearance into some quite different dimension of time-space; it is something that exists and manifests itself here and now, on earth; it is the movement from a lower level of life to a higher level, from one level of consciousness to a level with a qualitatively higher centre of organisation. It is hardly too much to say that the concepts of development and evolution which in variously limited and imperfect forms have begun to come up since the 18th century were present in alchemic thought in an obscurely intuitive way, incapable of basing themselves securely on an adequate scientific methodology, and yet passionately stirring the alchemist with a sense of grasping the core of the life-process. The intuitions of development thus fall back all the while into mystical formulations, into sterile recipes hidden in esoteric diction and symbol—as much to protect the alchemist against recognising his inability to apply his *gnosis* as



to exclude the profane who would mock at his weaknesses without being able to share his deep fugitive glimpses of the formative and integrative processes of nature.

For the spirit is again made happy in the body, as is also the soul, and runs with joyous haste to embrace it and does embrace it. Darkness no longer has dominion over the body, since it is a subject of light, and they will not suffer separation again for eternity. And the soul rejoices in her home, because, after the body had been hidden in darkness, she found it filled with light. And she united with it, for it had become divine towards her and it is now her home. For it had put on the right of divinity and darkness has gone from it. And the body and the soul and the spirit were all united in love and had become one: in which unity the mystery has been concealed. In their union the mystery has been accomplished, its dwelling-place sealed up and a monument built full of light and divinity.

For Fire has unified and transformed them, and from the hollow of its Womb they have gone forth, exactly as from the Womb of the Waters and of the Air which ministers to them. And Fire brought them forth from Darkness into Light, from Grief into Joy, from Sickness into Health, and from Death into Life. It clothed them with a divine spiritual glory such as they were not clothed with before. For in them has been hidden the whole Mystery which exists as something divine and unchangeable.

She goes on with her statement of the complexity of dynamic transformations in matter. Nature is seen, not as a series of mixtures in which the ingredients all exist on the same qualitative level and are thus computable in arithmetical terms or reducible to various geometrical atomic patterns. The mixtures and the patterns exist and are relevant to the inquiry; but the problem is to move beyond them to a grasp of the unseizable moment of total change, in which there is both continuity and discontinuity.

For the bodies coalesce with one another because of their virtue [their essential and dynamic quality, which makes them both what they are and what they may be].

In coming forth from the earth they clothe themselves with light and a divine glory, since they have grown according to nature and have undergone a change in form and have arisen from sleep and have gone forth from Hades. For the Womb of Fire has given them birth and they have clothed themselves with a glory from it. It has brought them to a single unity. Their likeness has been perfected in body soul, soul, and spirit, and they have become one.

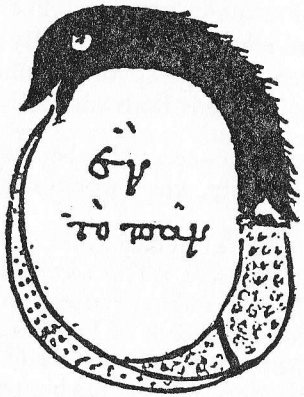
For Fire has been subjected to Water, and Earth to Air, in the same way as Air with Fire, and Earth with Water, and Fire and Water with Earth, and Water with Air, and they have become one.

For the One has been formed from Plants and Vapours; and from Natures and from Sulphur a divine substance has been produced, which pursues every Nature and overpowers it. See, natures have overpowered and conquered Natures, and as a result they change Natures and Bodies as well as things that proceed from their Nature. As the fugitive has entered into the non-fugitive, and that which overpowers into that which does not overpower, and they have been united to one another.

That is the Mystery we have learned, my Brothers, from God and from our Fathers, the high priest Komarios. See, I have spoken to you, my Brothers, all the truth that has been hidden away with many sages and prophets.

The philosophers then end the meeting. "You have amazed me, Kleopatra, with what you've told us. Blessed is the womb that bore you."

Indeed her discourse is the most imaginative and deeply-felt document left by the alchemists. It has a strong personal tone. We feel in its deep sense of life and its possibilities, an intense delight in the beauty of the earth as well as a sustained conviction in the powers of men to find the most fruitful and harmonious ways of integrating themselves with nature. She is inspired by the hope of an elixir, a pharmakon of life, and sees the scientific quest, not as a thing in itself, an abstract search for knowledge, but as a means of unimaginably enriching human life by integrating it consciously in the unitary process of the universe. She seems to have been the thinker who, for these reasons, most fully set the imagery of conception and childbirth in the heart of the alchemic idiom. But before we examine that imagery further, we must consider the Serpent Ouroboros who appears in Kleopatra's Goldmaking. The snake curving round with his tail in his mouth is an obvious emblem of the unity of the cosmos, of eternity, where the beginning is the end and the end is the beginning. It summarises the creed of up-and-down down-and-up, a circular movement of energies and qualities. It symbolises the Philosophers Stone or Egg in which All is included and yet a ferment of changes is going on. We have seen it in Kleopatra's Goldmaking, where it appears in both direct and abstract form. In another MS the serpent is made of three concentric rings. The outermost is scaly, with head and three ears shown in bright red, while the eye is white with a black pupil. The middle ring is also scaly and is coloured yellow, while the inner one, with four feet, was painted all in green. The four feet represented the tetrasomia, and the three ears the vapours (perhaps sulphur, mercury, orpiment). In a third MS we find a stylised version of the last design: two concentric rings with inscriptions close to those of Kleopatra's Goldmaking. A fourth MS has yet another variant; the axioms are there in red, but the circles are missing. Perhaps a copyist forgot to put them in. There appear also the signs for gold, silver, mercury, with those for lead and cinnabar (or the egg).[9]



39. Ouroboros: St Mark's MS 299 f188v



The tail-biting serpent has a considerable role in magic. A Leyden papyrus gives a good example. The text is in Egyptian hieratic with Greek inscribed on the inner face. It deals with rites brought about by Love envisaged as a great thaumaturgic power: the evoking of phantoms, the construction of images of Love, the making of a philtre composed of various plants. Recipes tell how to succeed in an undertaking, to get or send dreams, consult a deity who appears with a snake's head, bring someone bad luck, put a stop to someone's anger; then processes for refining gold, and how to make a talismanic ring by engraving on its jasper the figure of the tail-biting snake, which encloses the moon with two stars and the sun above. Love, we may note, appears in alchemic texts: in the midst of a recipe for transmutation in an incomprehensible phrase that seems the shred of some old mutilated treatise. And "Love Gold-extractor", where we are dealing with a work by an enigmatic person, Kron-Ammon.[10]

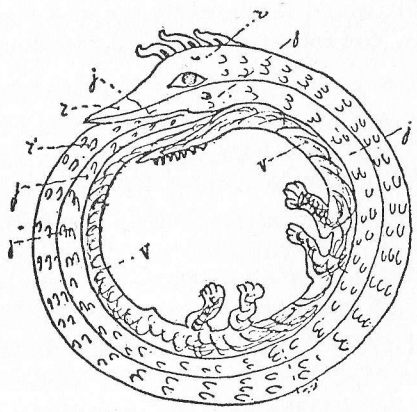
Another papyrus, after a long *logos* made up of many magical words addressed to the sun, sets out these directions: "the image, *andrias*, engraved on the stone is a lion-faced Helioros holding in his left hand an orb, *polos*, and [in the right] a whip, and round about him an ouroboros, and under the bottom of the stone, this name, keep it secret: *acha achacha chach chacrchara chach*." We may note that the grotesque Bes on the back of the Metternich stele stands on an elliptical cartouche formed by a serpent with tail in mouth which has been taken as a symbol of the abyss.[11]

On the engraved gems we find the *Ouroboros* enclosing a large number of different objects, inscriptions or symbols. For instance, on lapis lazuli, Osiris as a mummy; Sarapis with Kerberos at his feet; on haematite, the womb-symbol above which stands Isis-Tyche with sceptre and horn-of-plenty, and probably Anubis as mummy (? Thoueris); the womb-symbol over which are four deities, Anubis as mummy, the lion-headed snake Chnoubis, Bes, Isis with the horn; again the womb, here globular, with Nephthys (?), Anubis and Osiris as mummies, Isis-Tyche with horn; on red jasper, Harpokrates seated on a lotus in a papyrus-boat; a scarab; three ring signs; a rider design; a six-rayed ring-sign, an amphora with two drooping boughs that grow leaves and fruits, or buds—below *euthem*, probably an error for *eutheni*, *euthenei*, "flourish"; a rough figure that seems bound, with a trident-end or an object like an E turned forward over his head—compare the trident piercing the Evil-Eye on Syrian bronze pendants.[12] On a carnelian seemingly distorted by heat we find a Mithraic scene: inside the Ouroboros is a head at the top with a small oval under five cross-marks, perhaps stars; below, characters and letters; in the centre a table or couch with bundle, also a serpent with oxhead, a monster with ram-head on a snake's neck supported by the hindquarters of a goat; at the bottom, a jackal or fox. On one gem the encircling serpent has a seven-rayed human head which it turns in to the right, facing a seated Sarapis; there are star, scarab, crocodile, under the throne, and a crescent and a ladder-sign below the serpent-head.[13]

Generally the Ouroboros has in such designs a cosmic force, which magnifies the spell. With such figures as Sarapis or the mummied Osiris there may be an underworld significance. The snake which entwines the body of Aiōn on Mithraic monuments certainly shows the strong Time-aspect of the symbol. The word *aiōn* had expanded its means from lifetime, in Homer, to a long



space of time, and then at last to eternity by the later Hellenistic period. At Alexandreia a cult of Aion as the god of Time had grown up, in association with Kore, the earthmaiden. On the 5th January a statue of the god was brought by torchlight into the open from an under-earth sanctuary dedicated to Kore; and while pipes and tambourines played, it was carried seven times round the temple, then taken below the ground again. We are told that the rite signified the birth of Aion on this night by Kore. At Alexandreia, however, the images do not show the entwining snake; we see the god seated and naked, his head, hands, and knees decorated with gold seals. A statue found at Rome shows a god in a short loincloth encircled by a snake, its head resting on his; in both hands, pressed close to his body, he holds the ankh, the life-symbol; beside him stands a goddess, smaller in size, with the Isiac sistrum or rattle. A third statue found at a country-site where Domitian had a villa shows the loinclothed god with four arms, four wings, an eye in his chest, and lion-heads on his knees and stomach. Two serpents creep up on either side (one along a tree-trunk, one on a seat-arm); a lion-head and a water-snake can be seen on the tree-trunk and a three-headed Kerberos sits by his left foot. Lion and hydra, water-snake, represent the union and struggle of fire and water, while the four arms and wings stand for the four winds as the four cosmic forces. Macrobius in his Saturnalia says that the three heads of Gerberus stands for present, past and future. Aion became merged with Mithras as god of Time, and we see the snake twining round his body; sometimes



40. Ouroboros: Paris MS 2327 f196

the snake bites its own tail. As Helios-Mithras he became a high god by the 2nd century A.D., but still had his underworld aspect.[14]

The way in which Aion merges with Ouroboros can be seen in a Secret Stele from a magical papyrus, with its emphasis on circular motion:

> Hail whole structure of the pneuma of the air. Hail, pneuma that traverses all space from heaven to earth, and after the earth, taken to the central hollow of the world, right up to the extremities of the abyss. Hail, pneuma that enters into me, takes possession of me, and leaves me as God wills in his goodness. Hail, principle and end of immoveable Nature. Hail, revolution of the stars that tirelessly accompany your service. Hail, splendour of the solar rays in the service of the universe. Hail, circle of the Moon that lights up the night with unequal lustre. Hail, all the pneumata of the eidola of the air. Hail, you to whom one gives the hail in benediction, Brothers and Sisters, Holy Ones.
>
> O great, very great, inconceivable circular edifice of the world; celestial Pneuma, inside the sky; aitherial, inside aither; watery, earthly, igneous, aerial; luminous, dark; glittering with the light of the stars humid-burning-cold! I praise you, god of gods, you who have put together the universe member by member, who have made a reservoir of waters of the abyss by setting them on an invisible foundation, separated heaven from earth, and covered the heaven with eternal wings of gold, fixed the earth on eternal bases; you who have suspended the aither at the culminating point of the heavens, spread the air dispersed into all places by the self-moving winds, and set the Ocean in a circle all round; you bring storms, who thunder, launch lightnings, who make rain fall, who shake the earth, you who engender the living, God of the Aions. You are great, Lord, God, Master of the Universe.[15]

We can feel how Aion could be a great snake-form spiralling round in the courses of the stars, twining round all things as the oceanic serpent, the very pneuma or life-force of the "inconceivable circular edifice". If we look back to the consecration of the ring for bringing success mentioned above with an Ouroboros enclosing sun and moon cut on a jasper, see how the enclosing serpent is directly linked with Aion. On the jasper the name Abraxas is set over the sun and on the back of the stone; on the gold circlet of the ring "powerful holy ever-efficacious name Iao Sabaoth". During the consecration, with its sacrifice and other details, a prayer invokes the gods of the heaven, the gods of the earth, the gods of the middle; the magician presents himself as a



sort of all-god, *pantheios*. He is the Sun, Aphrodite Typhi, Kronos, Mother of the Gods, Osiris, Isis, Souchos; he is "Faith [*Pistis*] that has been found among men, and the prophet of the holy names"; he is "the ever-equal (?), he who is born of the Abyss". Also, "I am the sacred bird Phoenix." Then he invokes the Universal God, the ancestral god:

> Come to me, you who rise from the four winds, you who have breathed into man pneuma so that he may live. Master of all the beauties of the world, listen, who own the hidden and ineffable name. At this name the demons are gripped with fear, the sun on hearing it, the earth are smitten with vertigo, Hades is thrown into agitation. At this name, rivers, sea, pools, fountains are frozen up. At this name rocks are broken. The heaven is your head, the *aither* your body, the earth your feet, the water surrounding you is the Ocean. Agathos Daimon, you are the lord that begets, nourishes and makes all things grow.

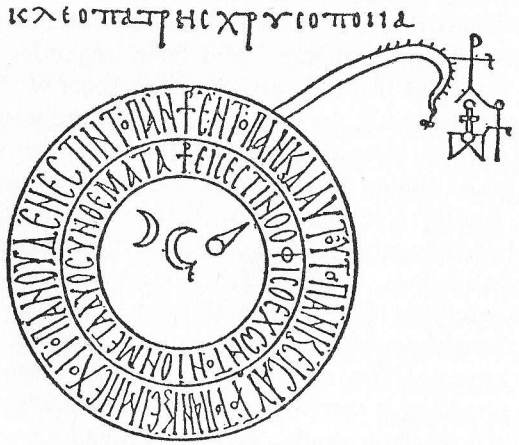
The Good Spirit here seems certainly Aion. Soon after, the text asks, "What Aion, nourishing the Aion, reigns over the Aions: the one immortal god?"[16]

The Phoenix whom the magician identified himself with was here a sort of doublet of the Ouroboros, and Aion a symbol of perpetually renewed time. Another magic text declares, "Hail, Tyche and Daimon of this place . . . Hail, the Envelopper; that is, the earth and heaven. Hail, Helios! You are he that is established on the holy foundation in an invisible light. You are the father of the ever-reborn Aion. You are the father of the unapproachable *Physis* [Nature]. You are he that contains in yourself the mixture of cosmic nature, who have engendered the five wandering stars [the planets], who are the viscera of the heavens, the entrails of the earth, the flowing of water, the impetuosity of fire. . . ."[17] Time is thus identified with Nature, with the mixture and the flux of things as also with the enduring structure. A prayer to Apollo (assimilated to Abrasax, Adonai, Ancestral God, Self-begotten, and Helios) cries, "I adjure the eternal god, the Aion of all beings, I adjure *Physis* born of herself . . ."[18]

In the symbolism of Kleopatra and the alchemists in general, then, the Ouroboros was used to represent the All, which was One, in its aspect of Time: that is, as a system in ceaseless development, yet revealing a comprehensible structure which could be defined in the triadic formula. The cosmos had a beginning and an end; it had no beginning and no end; it contained and was

contained; it was stable and unstable, a form inside the flux and a flux inside the form. These ideas appear in the magical and religious texts; but they have a coherent and concrete aspect in the thought of the alchemists which they lack elsewhere. For the alchemists alone were trying to apply them in the exploration of matter and its manifold changes.

Imagery similar to that surrounding Aion appeared in connection with Hekate in the Chaldean Oracles. There as *Zoe* she produces the life of blessed immortality; as *Psyche* she ensouls the worlds; as *Physis* (*Ananke*, Necessity) she rules over the spheres; as *Heimarmene* (Fate) she dominates the earth-zone. "Do not look at *Physis*, for her name is determined by Destiny."[19] She is also a Girdler, encircling and holding all things together. This aspect is brought out by the winding snakes on her statue. She is the universe with her hairs visible "by the glaring terrifying light" of the fiery snakes that symbolise the spheres. She is also a girdler as representing the Zone of Dreams; for dreams are brought by daimons of the moon or the aerial sphere. She is the mistress of the daimons and thus is the dream-sender. Her girdle stands for the limit of the aitherial and the sublunar worlds; in each of those worlds her ensouling power works differently, for one world is seen as composed of regular motion, the other of the conflicting powers of spirit and matter. Psyche comes in here as the ensouling principle. Created directly by the Father, without mother of other intermediary, she "ensouls the All with her warmth". In a way



41. Ouroboros: St Mark's MS 299 f188v



we can refer these images back to the *Timaios* with its idea of "evil encircling material nature and our earthly dwelling-place with necessity".[20]

Ideas about the Ouroboros found their way into the literary world, *e.g.*, in Artemidoros and Macrobius. The former, in his dream-book, remarks that "the dragon also signifies Time because it is long and undulant". The latter declares the two-headed Roman god Janus is the world:

> that is, the heavens, and his name Janus comes from *eundo* [by going] since the world always goes rolling on itself in its globe-form . . . So the Phoenicians have represented it in their temples as a dragon curled in a circle and devouring its tail, to denote the way in which the world feeds on itself and returns on itself. . . .
>
> It is also clear that it's the Sun honoured under the name of Mercurius [Hermes] according to the caduceus that the Egyptians have consecrated to the god in the figure of Two Serpents, male and female, interlaced. Their upper extremities bend round together, and, embracing one another, form a circle, while the tails, after forming a knot, come together at the haft of the caduceus and are provided with wings that start off at this point.[21]

Even more interesting is the passage that ends the second book of Claudian's poem, *On the Consulship of Stilicho*. Claudian came from Egypt and his imagery shows the Egyptian idea of the night-journey of the sun through a cave or tunnel in the earth. But the introduction of the Ouroboros in association with *Natura* (*Physis*), the various metals, and the Aged Seer strongly suggests one of the alchemic visions of revelation or initiation:

> Far off, unknown, beyond the range of thought,
> scarce reached by gods, the years' rough haggard mother,
> stands a primeval Cave in whose vast breast
> is Time's cradle and tomb. A Serpent encloses
> the Cave, consuming all things with slow power
> and green scales always glinting. Its mouth devours
> the backbent tail as with mute motion it traces
> its beginning. At the entrance Nature sits,
> the threshold-guardian, aged and yet lovely,
> and round her gather and flit on every side
> Spirits. A Venerable Man writes down
> immutable laws. He fixes the number of stars
> in every constellation, makes some of them move
> and others hang at rest. So all things live
> or die by predetermined laws . . .

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When the Sun rested on the cave's wide threshold,
Nature ran in her might to meet him; the Old Man bent
grey hairs to the proud rays. Of its own accord
the adamantine door swung open, revealing
the huge interior, displaying the House
the Secrets of Time. Here in appointed places
the Ages dwell, with varying Metals marking
their aspect. Those of brass are there upheaped,
there stiff the iron, there the silver gleaming;
shy of earth-contacts, in a distinguished section,
is set the flock of golden years.[22]

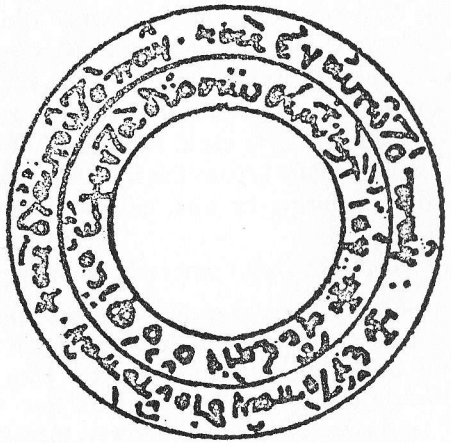
The Sun chooses one of the richest substances to be marked with Stilicho's name; bids the rest follow him and addresses them as they pass. "The consul is come for whom we have delayed an Age of nobler ore." Something of a golden age is prophesied. Then the Sun enters "his Garden starred with fiery dew, the valley round which there runs a river of flame that feeds with bounteous rays the dripping weeds on which the horses of the sun crop pasturing". As often with Claudian we find a genuinely imaginative reconstruction of the ideas of his period in terms of the contemporary situation: here, the need of the Empire to find some way of transforming itself.

There is yet another source by which we may judge the ideas held about the Ouroboros. Horapollon—his date is unclear, but was probably 5th century—attempted to explain in Greek the meaning of Egyptian hieroglyphs, with a slight amount of genuine knowledge and a great deal of the fantasies characteristic of his age. His work is thus of much value in telling us what that age made of various symbols. He gives the Ouroboros three main meanings: Eternity, the Universe, Power or Dominance. First the question of time:

To signify Eternity [*Aiōn*] they draw the Sun and Moon because they are eternal elements. But when they want to represent Eternity differently, they draw a Serpent with his tail hidden by the rest of the body. This the Egyptians call *Ouraion*, but the Greeks a Basilisk. They make it of Gold and set on the [heads of] Gods. [Eternity] because of the three kinds of serpents this alone is immortal, the others being mortal. Should it blow on any creatures, even without biting, the victim dies. So, as it seems to have power of life and death, they put it on the heads of the gods.[23]



The three kinds of snakes were *ptyas*, *chersaia*, and *chelidonia*; Galen says that the *ptyas* "spat poison into bodies with a good aim". Horapollon's idea of it blowing may have some connection with *pneuma*. But the uraeus (the cobra or asp) with which the Egyptians crowned their gods, did not stand for eternity; it had been worshipped from early times and was taken by the dynastic Egyptians as a sign of sovereignty. The disk of Re (the Sun) had a cobra coiled round it. However, an asp sacred to Isis was called Thermouthis and came to be regarded as immortal in Egypt; Ploutarch calls it unageing.[24] Kyrillos of Alexandreia,



42. Ouroboros: Paris MS 2225 f82, stylised version

in his attack on Julian, says that the snake is the emblem of the heavens because of its circular coil and that of time because it is "long and many-spiralled". Artemidoros in his Dream Book sees the skin-sloughing serpent among other things as time.[25] The symbolism was picked up again at the Renaissance. Marsilio Ficino, translator of Plotinos, remarks in a gloss on a passage declaring the hieroglyphs to be Platonic ideas made visible: "Your thought of Time, for example, is manifold and mobile, maintaining that Time is speedy and by a sort of revolution joins the beginning to the end; it teaches prudence, produces much and destroys it again. The Egyptians comprehend this whole discourse in one stable image, painting a winged serpent that holds its tail in its mouth."[26]

Next the Ouroboros as the emblem of the universe. Horapollon says:

> Wishing to represent the cosmos, they draw a serpent devouring its own tail, marked with variegated scales. By the scales they suggest the stars in heaven. This beast is the heaviest of animals, as the earth is the heaviest [of elements]. It is the smoothest, like water. And as each year it sheds its skin, it [represents] old age. But as each season of the year successively returns, it grows young again. But the fact that it uses its own body for food signifies that whatever things are generated in this world by divine providence are received back into it by diminution.[27]

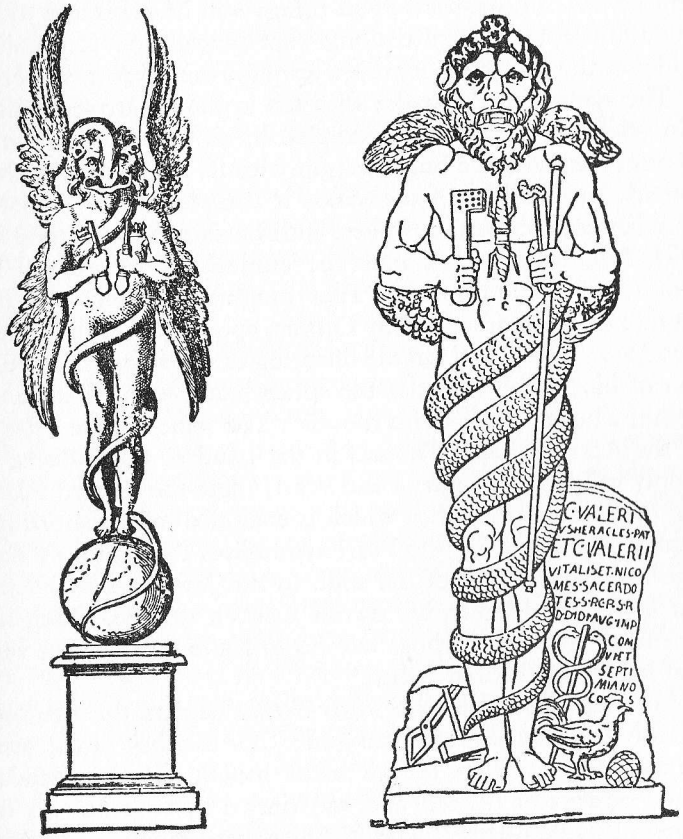
He is punning on *geras*, which means both "old age" and the "sloughed snake-skin". Servius in his commentary on the *Aeneid* says that the Phoenicians use the image of the snake curved in a circle and devouring his own tail to represent the universe which revolves out of itself and into itself. He adds that "The year was indicated by the Egyptians before the invention of letters by the drawing of a dragon biting its own tail: because it comes back upon itself."[28]

Thirdly, the Ouroboros represents power or perfection:

> To show a very powerful king, they draw a serpent represented as the kosmos with its tail in its mouth and the name of the king written in the midst of the coils, thus intimating that the king rules over the kosmos. And the name of the serpent among the Egyptians is *Meisi*.
>
> To show the king as guardian in another way, they draw the serpent in a state of watchfulness. And instead of the name of the king they draw a guard. For he is the guardian of the whole world.
>
> Again when they consider the king to be a cosmic ruler and wish to represent this, they draw the serpent and in the middle they represent a great palace. And reasonably, for the place of the king's palace is the kosmos.
>
> When they want to symbolise the king ruling not the whole world but a part of it, they draw a serpent cut in half.
>
> They symbolise the Pantokrator by the perfect animal, again drawing a complete serpent. Thus among them that which pervades the whole cosmos is *Pneuma*.[29]

The development of absolute monarchies in the Greek world after Alexander, who in various ways made claims to divine honours, led in turn to an increase in henotheistic tendencies in religion. Especially after the later Stoics produced apologetics for the kingship, with the centralised State supposed to reflect






43. Aion: nude lionheaded figure on globe, serpent entwining thrice with head over skull and about to enter mouth (sketched by Bartoll from account of Mithraeum found in Rome in 16th century); and statue from Mithraeum at Ostia, serpent entwining six times with head resting on skull; wings with symbols of seasons on back; hands hold keys and sceptre; thunderbolt engraved on breast; at base, hammer and tongs of Vulcan-Hephaistos, pine and cock of Aesculapius-Asklepios (? or Sun and Attis), and caduceus of Mercury-Hermes.

the divine guidance of the cosmos, the earthly and the heavenly ruler became ever more entangled; ideas and practices in politics affected ideas and practices in religion, and vice versa. The old notion of a King as necessarily Lord of the Cosmos was revived on a new level. With the Roman Empire the notion of an Almighty on earth and in heaven inevitably grew stronger. "There

will be a Kosmokrator and all things will be subjected to him," said the astrologer Hephaistion. From Caracalla on, Kosmokrator, Ruler of the Universe, became a term for the Roman Emperor.

The symbol of the snake with tail in mouth attracted also the Gnostics and writers of apocrypha. In the *Pistis Sophia* we read, "Outer darkness is a huge dragon with its tail in its mouth; it is outside the world and surrounds it completely."[30] The serpent here has connections, however, with Leviathan the dragon of the Old Testament, which must be annihilated before the lower world can be redeemed.[31] That dragon, depicted also in the Ophite diagram described by Origen, appears again in the *Acts of the Apostle Thomas*, "I am the offspring of the serpent nature," the son of him "who encircles the sphere" and who "is around the ocean, whose tail lies in his mouth". The same *Acts* has the Song of the Apostle Judas Thomas in the Land of the Indians, commonly called the Hymn of the Pearl; there the desired Pearl lies "in the middle of the Sea which is encircled by the snorting serpent". The quest for the Pearl symbolises the saviour's descent into matter in search of the soul. In the Jewish *Acts of Kyriakos and Iulitta* the hero in his travels meets a dragon, "king of the worms of the earth, whose tail lies in his mouth . . . the serpent that led astray the first Adam."

Another passage in the *Pistis Sophia* depicts the dragon differently,[32] as the supreme sun-god: "But the disk of the sun was a great dragon, with its tail in its mouth, which ascended to seven powers of the left and was drawn by four powers in the shape of white horses." The *Pistis* has been taken as the work of Syrian sects known as Barbelo-Gnostics, but the original text is in Koptic (Sahidic); and here we see a strong Egyptian image. Macrobius in his Saturnalia compares the setting and rising of the sun to the sloughing of the snake-skin, and ascribes the origin of the symbol to the Phoenicians.[33]

The serpent biting his tail was worshipped at Hierapolis in Phrygia; also by the Naasenes. The Gnostic Ophites worshipped the snake; and Ophiouchos, both a man and a constellation, played the main role in the mythology of the Perates, a sect of the Ophites, snake-worshippers. Ophiouchos, snake-masterer—the author of *Philosophoumena* compared the *Logos*, Christ, with him.[34] The Ophites declared, "We venerate the Serpent because God has made it the cause of *gnosis* for mankind. Ialdabaoth wanted men to have no recollection of the Mother or of the Father on high. The



Serpent, by tempting them, brought them *gnosis* and taught the man and woman the complete knowledge of the mysteries from on high. That is why [its] father Ialdabaoth, mad with fury, cast it down from the heavens." They argued, "Our bowels, thanks to which we nourish ourselves and live, do they not reproduce the form of the serpent?"[35]

The primeval serpent existed all over the Near East as well as in Egypt. It is, however, in ancient Egypt that we find the clearest antecedents of the alchemic ouroboros. There the cosmic serpent appears as Sito, who is shown with many coils or with tail in mouth. In the Book of the Dead, chapter lxxxvii, the sloughing motive is used, "I am Sito dilated with years, I die and am reborn daily. I am Sito dwelling in the farthest regions of the world."[36] As Scribe of the Divine Book, the serpent has his link with Thoth-Hermes.[37] Amun also was identified with a serpent creator, and of the Ogdoad, the eight cosmic deities at Hermopolis, four (female) are shown with snake-heads.[38] A hymn from the Coffin Texts shows that the creative word was uttered by the coiled serpent. "I bent right round myself. I was encircled in my coils, one who made a place for himself in the midst of the coils. His utterance was what came forth from his own mouth." At the end of time, *The Book of the Dead* says, the world will revert to its primary state, and Atum, or Re, will again become a serpent.[39]

In the inner coffin of Zepi the tail-eater is represented as symbol of the cosmic ocean surrounding the world; and in the innermost shrine of Tutankhamen a mummy-like figure is ringed above and below by two encircling serpents, those of sky and earth.[40] We also find a few representations of Osiris bent right round, head to feet, encircling the Tuat or Underworld. A long snake surrounds the Sun god in his boat; the solar eye appears enclosed in oval (cosmic) waters; and the night-sun is depicted encircled by a five-headed snake. Osiris, transformed into a serpent, takes again the form of the primordial abyss.

Relevant too are the ancient representations of the cosmos as

44. The Consort of the Sky-goddess in his circular form

Nut standing on the earth and bent right round, supporting herself on her hands: her elongated middle as the sky. Under her Geb lies flat. These two figures, female and male, enclose all things. To bring the point out, Geb is shown touching Nut's hands with his toes and reaching out to touch her toes with his fingers. Once he appears as a snake. In another design, between him and Nut, is a snake biting its tail to repeat the pattern of enclosing earth-sky.[41] The twisted-back posture that Geb at times assumes is connected with the acrobatic dance, which I have elsewhere shown to be a ritual dance of life and death. It is especially linked with death, and the circular twist-back of the body must have something of the sense of completion, of merged ends and beginnings, which emerges in the Ouroboros. Though this death-birth dance was very ancient, its significance was still strong in the minds of men who were interested in symbolism; for its imagery pervades the *Dionysiaka* of Nonnos of Panopolis in the 5th century A.D.[42]

A small point: the star-scales of the cosmic serpent have their anticipation in what seem *pholides*, scales or beast-dapplings, on the body of Nut, of Hathor the sky-cow, or of the serpent. Ailian remarks, "I hear the Kings of Egypt wear speckled asps on their diadems."[43]

Inevitably the serpent as the cosmic encircler, as Okeanos, at times was confused with, or merged into, the serpent as the enemy. In alchemic myth he was seen then as a guardian of the secret that had to be gained, the initiation-monster that had to be slain or outwitted. After the design of the dragon with three ears and four feet we read, "The dragon is the guardian of the temple. Sacrifice him, skin him, separate the flesh from the bones, and you will find what you seek."[44] Then appears the man of brass who changes colour and becomes the man of silver, who in turn becomes the man of gold. The destruction of the serpent reminds us of the ancient Egyptian ritual for demolishing Apepi, who sought to swallow the sun. Only by continually breaking Apepi up could the course of the sun be kept safe and the daily rising assured.[45]

In a passage in Stephanos, as in later alchemy in general, the serpent in his annihilations seems to represent the moment of putrefaction.

As for the field, know that it has many unprofitable farmers, and unless you cast these out you'll get no profit from the field. There



are all the Six Brothers [metals] attendant on *klaudianos* and the others together. Except for the 2 useful ones, they are not One. And all the *leukargenos* [not known elsewhere] is useless. For the field has a Serpent and he dries up the place with his breath, where also men grow enfeebled. And I saw him and the spotted scales of his body. The beginning of his tail was white as milk, but his belly and back were saffron-hued and his head was greenish-black. You should divide the field into 3, the 4 brothers one part and the great stone one part, for thus the ancients sought to do with the field, as I found out. For so does Theodoros the Magistrianos, and so Iakobos the lapidary teaches.[46]

*Klaudianos* occurs eleven times in the alchemic corpus; it has been interpreted as a copper-lead alloy perhaps plus some zinc, equivalent to *aes Claudianum*.[47] But this is dubious; it is ranked with minerals rather than metals. The description of the colours of parts of the dragon are found in two anonymous fragments of uncertain date.[48] In the poem by Theophrastos the serpent is both Ouroboros and the moment of whitening:

> A Dragon springs from that. For twenty days
> exposed in horse-dung, he'll devour his tail
> till nothing is left of it. This Dragon's name
> is *Ouroboros*. He is white to see,
> his skin is spotted, and his form and shape
> are very strange. At birth he was produced
> out of the warm wet substance of mated things.
> The close embrace of male and female kind,
> a union clasped and working in the sea,
> brought forth this Dragon, as I said, a Monster
> blasting all earth with flames. With all his might
> and armour shown, he swims until he reaches
> a site within the currents of the Nile.
> His glistening skin and his engirdling bands
> are bright as gold and shine with points of light.
>
> Then sieze and slay with skilful art this Dragon
> there in the sea, and quickly wield your knife
> two-edged with hot and moist. And when you've cleft
> his carcass through, lift out the gall and take
> its blackened form that's heavy with earthy bile.
> From it ascend great clouds of steaming mist,
> which, when they've risen dense enough, can bear
> the Dragon from the sea and lift him up
> to a warm station. The air's moisture upholds
> his lightened shape and form. Be cautious then.

Don't burn his substance. Rather change its nature
with quenching draughts. Pour out the mercury
into a gaping urn; and when its stream
of sacred fluid ceases flowing, wash
the blackened dross of earth away with care.
So, when you've brightened what the darkness hid,
inside the Dragon's entrails, you will bring
an unspeakable mystery to light. For there,
extremely bright and lucid, it will shine,
and, tinged throughout with perfect white, will stand
revealed with marvellous brilliancy—its blackness
changed utterly to white. When cloud-sent water
flows there, it cleanses each dark and earthy stain.
Thus easily he frees himself by drinking
nectar, though he's quite dead; and all his wealth
he outpours for mortals. Abundantly the earthborn
are sustained in life when they have found at last
the wonderful mystery, which, being fixed,
will turn to silver, dazzling-bright in kind,
a metal purified of earthly taint,
so shining, clear, and marvellously white.

45. Aion, relief in white marble (found in same Mithraeum as no. 43a); naked to waist, then wide trousers; extended arms hold torches; four wings from back, two pointing up, two down, with serpent round each. Circular burning altar with god's breath, *pneuma*, connected



Theophrastos described also the stage of yellowing as a killing of the dragon. Now liquid mercury can be dispensed with; only heat is needed. The knife of fire replaces the double-edged knife of hot and moist.

Then seize again the Dragon changed to white
(a change divinely achieved, as I have told,
by means of whitening twice performed). Again
kill him with a knife of fire, draw all his blood
which gushes blazing-hot and red as flame
glittering as it ignites. Then dip his skin
into the blood that spurted from the wound
deep in his belly (as you would dip in dye
of murex-purple a whitened robe). You'll gain
a shining glory lustrous as the sun,
of noble form and gladdening the heart
of mortals who behold its excellence.[49]

The whitened metal is melted over a fire, preparatory to the addition of the Stone of powder of projection. Drawing off the melted metal is here described as drawing out the blood of the dragon, and stirring in the powder as dipping the skin in the blood. In the alchemic lexicon mercury is the Seed or the Bile of the Dragon as well as the Milk of a Black Cow, Water of Silver, Water of the Moon, River Water, Dew.[50]

It is perhaps not irrelevant to end this section with a reminder of the important part played by the Ouroboros-image in a great chemical discovery. Friedrich Kekulé in 1865 had a vision of a snake seizing hold of its own tail and was thus led to formulate his theory of the benzene ring.[51]

# 13

# Womb Furnace and Vase

We have noted some examples of imagery from mating, gestation and birth in alchemy. Now we had better look at the extent to which such ideas penetrated ancient culture. The division of ores and metals, stones and precious stones into male and female was very ancient. The Mesopotamians had made it, using shape, colour and brilliance as criteria. An Assyrian text spoke of "the *musa* stone, male [in shape] and the copper stone, female [in shape]". The male stones were thought to be those with a more vivid colour; the female ones were the paler. The ancient onomastica and recipes recognise male and female forms of various minerals or chemicals; the male here being in general the harder or darker modification or characterised by some sort of structure that suggested maleness.[1] Stones were thought to have their own force or magical powers; they were thought also to grow like organisms, though more slowly, and at times to produce their young.

In Babylonian ritual texts we find a sexual division of salts and ores; and the general outlook survived into the medieval world in alchemic writings and in lapidaries.[2] Syrian alchemical works speak of female magnesium; the *lapis judaicus* was male or female.[3] In dealing with stibnite (a common antimony sulphur, brittle with a metallic gloss like galena) Plinius writes, "In the same silvermines is found what we might best describe as petrified foam, white and shining, but not transparent. It is variously called *stimmi*, *stibi*, *alabastrum* and *larbasis*. There are two varieties, male and female, of which the female is considered the better. The male is coarser, rougher, less dense. Its surface is not broken and it contains more grit. The female on the other hand glistens and is easily broken, showing a lengthways cleavage instead of crumbling into small lumps." Dioskorides makes the same distinction. In ancient Egypt the Ebers papyrus mentions *stimmi*,



and speaks of true and male stibnite no less than thirty-six times.[4] Again Plinius tells of the male and female *sandastros* (possibly aventurine quartz):

> . . . golden particles that shine like stars within the stone, always within its structure and never upon its surface. More, there is always a religious aspect declaring their affinity with the stars, because the embellishing starry particles generally conform in number and arrangement to the Pleiades and Hyades, They are therefore regarded by astrologers as *caerimoniae* [ritual objects].[5]

Plinius further respects the belief of Theophrastos and Mucianus that certain stones had offspring. Theophrastos in *On Stones* states that some have the power "to act on other substances or to react to them and to fail so to react. For instance, some stones can be melted while others cannot be, some are combustible, while others are not, and so forth. More, in the very process of combustion or rather of exposure to fire, stones exhibit many differences. Again, some stones, the *smaragdus* for example, have the power of communicating their colour to water, and others that of completely petrifying objects placed in them. Some have a power of attraction, and others of testing gold and silver, like the so-called Herakleian and Lydian stones. But the greatest and most remarkable power, if it be true, is that possessed by the stones that bring forth other stones."[6] Futher he makes such remarks as: "the stone known as *sapphieros*, which is black and does not differ greatly from the male kind of *kyanos*." And dealing with the lyngourion (which was thought to be made of lynx-urine) he says that the urine of the male lynx produces a better (probably darker) stone than that of the female. Plinius tells us:

> The *paeanis* [Apollo Stone], otherwise known as *gaeanis* [earthstone] is said to become pregnant and give birth to another stone. It is therefore considered to relieve labour pains. Its birthplace is in Macedonia, near the Tomb of Teiresias, and it looks like ice.[7]

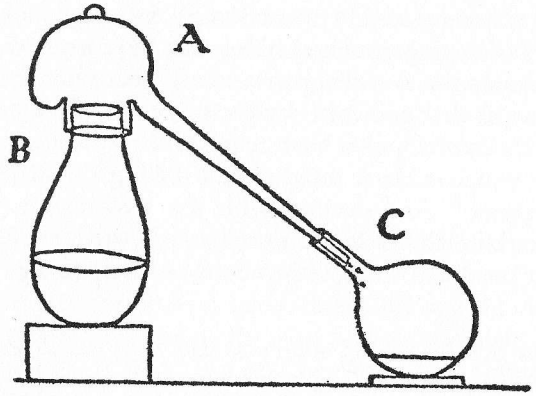
The name-link with Apollo and the place-link with Teiresias suggest also some mantic connection.

We find the sexual differentiation of ores also in Africa, *e.g.* among the Kitara, who consider as male the hard black stones found on the surface, as female the soft red ones from down inside the mine—that is, deep inside mother earth. The mingling of the two kinds of stone is needed for fruitful fusion in metallurgy.

STOKE-ON-TRENT
CITY

In ancient China, Yu the Great, the primeval smelter, could tell male from female metals; and he saw a parallel between his boilers and the cosmic forces of *yang* and *yin*, which also had a sexual basis.[8] A common instance of sexual differentiation all over the world is provided in firemaking rites, where the hard male stick is rubbed or twirled into the softer female stick, which at last bursts into flame. Nonnos applies the distinction to firemaking stones:

> As the female stone is struck by the male stone,
> one stone on another brings flame to birth as crusht
> and beaten it loosens a shower of sparks from itself,
> so the heavenly fire is kindled in clouds and murk
> crusht and beaten, but from earthy smoke,
> thin by nature, the winds are brought forth.
> There's another floating vapour drawn from the waters,
> which the sun, shining full upon them, milks out
> and draws up dewily through boiling tracks of air;
> this thickens and produces the cloudy veil . . .[9]




46. The still

and ends by coming down as rainwater. Here we have the two vapours of Aristotle, but Nonnos adds an alchemic touch with his idea of boiling air. The Dyaks, we may note, call a heavy fall of rain male. *The Book of Enoch* divides the cosmic waters: "The upper water will fill the role of man, the lower that of woman." And the *Zohar* says that a well fed by a stream symbolises the union of man and woman,[10]



Trees and plants were more naturally given sexes. Nonnos has the male and female palm-trees pledging love. Artificial fertilisation and the grafting of date and fig-trees had long been known in Mesopotamia; at least two paragraphs of Hammurabi's *Code* deal with the practices. The latter were seen as a ritual. Maimomides says that Jews were forbidden to use lemons from grafted trees so as to prevent them from being drawn into orgiastic activities of the neighbouring peoples. Ibn Washya, whom he cites, speaks of graftings "contrary to nature" of lemon-bough on to laurel or olive, and declares that the graft only succeeds if it is done ritually and during certain conjunctions of the sun and moon. A very beautiful maiden must hold the bough while a man from behind has anal intercourse with her; and while he is thus enjoying her, the girl grafts the branch on the tree. Thus the human act of intercourse ensures the marriage of two different trees.[11] The Mesopotamians classified vegetable species as male and female, concerned especially with any likeness to the genitals and with the role of the plant in magical operations. Cypress and mandragora were male; the shrub *nikibtu* (liquid-amber orientalis) was male or female according to the form or the ritual role. Sanskrit terminology shows the close comparison of plant-forms with male and female genitals; and Caraka, in *Kalpasthana*, writes of the sexuality of plants.[12] The Jewish exegete, Bahya ben Asher (died 1340) stated that male and female distinctions were found, not only in plants, but in all vegetable species and also in minerals.[13]

The same general application of the principle can be found in ancient Greece and Rome, even if there was never any attempt at systematic development. The Perates said of the sea that it was male and female; and Horapollon tells us obscurely, "To symbolise Hephaistos they [the Egyptians] draw a beetle [scarab] and a vulture; and Athene, a vulture and a beetle. For the universe seems to them to be composed of the male and the female. And they draw a vulture in place of Athene; for only these gods among them are hermaphroditic."[14] In fact there was a strong hermaphroditic element in early Egyptian religion, since there was a general idea of the creator-god as needing both sexes inside himself. We can find the same traces in Greek religion. Ploutarch cites for his day a confused version of Egyptian cosmogonic images:

> Apis, they say is the animated image of Osiris; and he is conceived when a generative light falls strongly from the Moon and touches a

cow that is in heat; for which reason many of the decorations of Apis resemble the appearances of the Moon. Thus, he blackens over his shining parts with dusky robes, since it is on the new moon of the month Phamenoth that they hold the festival they call the Entry of Osiris into the Moon—which marks the beginning of spring. So they place the power of Osiris in the Moon and say that Isis, as the cause of his birth, is also his wife. Therefore they call the Moon the Mother of Kronos and hold that she is of hermaphroditic nature, as she is filled and impregnated by the Sun, and again she emits and disseminates in the air generative principles; for she does not always express the mischief wrought by Typhon [Seth], but, being later conquered by the birth and bound by it, she all the same emerges again and fights her way through to Horos—this latter being the universe that surrounds the earth and us not wholly exempt either from generation or destruction.[15]

In Horapollon's statement Hephaistos would stand for Ptah, and Athene for his consort Neith. On a Ptolemaic ring the ideogram of the scarab completes the writing of the name Ptah; and the Theban cosmogony of that period told how an Egg fell from the heavens and out of the Egg came Ptah-Tanen in the form of a serpent with scarab-head.[16] Seneca also reports that:

The Egyptians recognise four elements, then they divide each into male and female. The male air is the wind, the female air is that which is hazy and stagnant. The water of the sea is male, all the other waters are female. In fire the part that burns and devours is male; the luminous and harmless part is female. Finally they call male earth the rocks and stones which own more strength, and the female earth that which lends itself to cultivation.[17]

The idea of a male-female deity was buried deep in early Greek thought, but it was pushed out by the strong sense of male dominance that appears in the Olympian system. It was reborn as a philosophic idea in the 5th century, if we may judge by the lines of Aischylos that speak of Zeus as both the rain out of heaven and as the fecundated earth. Aristotle sees male and female as the *mimēmata*, copies, of the formal and material principles at work in all things.[18] But it was with the growth of Stoic ideas and the reformulation of Pythagorean doctrines in the later 4th and the 3rd centuries that the concept of a male-female principle seems to develop strongly. Iamblichos thus describes Pythagorean positions that probably date from that period:



The Pythagoreans call the Monas not only *God* but also *Intelligence* and *Male-and-Female*. . . . In so far as it is, in a general way, the seed of all things, they define the Monad as both male and female, not only because they regard the Odd as male as being divisible with difficulty, the Even as female because easily divisible, and the Monad alone (or on its own) is both *Odd* and *Even*—but also because it is conceived as father and mother, possessing *logos* of matter and of form, of worker and thing worked-on.

And indeed it is able to produce the *Dyad* because it is moved by a double motion; for it is easy for the worker to draw the material to himself or the material on its side to draw the worker. As for the speed, which, for what it is of itself, is able, once sown, to produce both females and males, it presents in an indivisible manner the nature of the two up to a certain point in its development. Only when it begins to become the fruit or animal of plant does it henceforth admit of separation and differentiation in one direction or the other; for it has passed from potentiality into actuality. On the other side, if there is in the Monad the possibility of all number, the Monad should be an intelligible number [*i.e.* a number purely thought or abstract] in the correct sense, for it does not yet manifest any actually realised number —all numbers being together in it in a purely conceptual manner.

Besides, according to a certain way of defining things, they call matter also *Universal Receptacle* in so far as it is not only able to produce the Dyad, which is matter in the true sense, but it is also the receptacle of all the seminal *logoi*, if it is correct at least that it is the universal purveyor and dispenser. In the same way they call it *Chaos*, namely the Firstborn Chaos of Hesiod from which everything else comes as from the Monad. Finally the Monad is conceived as *Confusion* and *Mixture*, *Absence of Light* and *Obscurity*, since all that will later emerge is still in it without differentiation or distinction.[19]

Iamblichos here is largely paraphrasing the work of Nikomachos of Gerasa of the 2nd century A.D.

In an Orphic hymn that goes back at least to the 2nd or early 1st century B.C. we meet the line: "Zeus becomes Male, immortal Zeus becomes Bride." Valerius Soranus, cited by Varro, imitated the verse in Latin. There is perhaps Stoic influence here; for Diogenes of Babylon, about 240–152 B.C., wrote a Stoic type of allegory in which Zeus is represented as all things, all gods, and so both male and female. Chrysippos in the 3rd century B.C. had called Zeus Aither "both Father and Son".[20]

There thus seem converging Pythagorean and Stoic ideas on the creative principle as male-female. Perhaps some eastern or Egyptian influences played a part in the development; but the

ideas can be explained well enough as originating out of the Greek systems. They are of interest here as providing one of the philosophic bases from which the alchemic idea of the unitary process with its inner dialectic was built up.[21] The Chaldean Oracles see the Mother in the Father, and speak of the world-forming Ideas that "move about the terrible Wombs like bees". These Wombs are in the Cosmic Body. The same sort of imagery however goes far back, for Diogenes Laertes tells us of Leukippos that the heavier atoms in their winnowing whirl form a primary spherical system. "This parts like a hymen, enclosing within it atoms of all kinds; and as these are whirled through the centre's resistance, the enclosing hymen becomes thinner . . ." Hymen was used for a thin skin or enclosing caul, membrane; its link with sexual and generative functions appears in the fact of the marriage-god being called Hymen.[22]

The sexual classification of opposed forces or principles entered also into astrology. Ptolemaios says:

> Since there are two primary kinds of natures, male and female, and of the forces already mentioned that of the moist is especially female—for as a general thing this element is present to a greater degree in all females, and the others rather in males—with good reason the opinion has been handed down to us that the Moon and Aphrodite are female, and that the Sun, Kronos, Zeus and Ares are male, and Hermes common to both genders, inasmuch as he produces dry and moist alike.
>
> They state too the stars turn male or female according to their aspect to Sun. When they are morning stars and precede the Sun, they turn male, and female when they are evening stars and follow the sun. More, this happens also according to their positions with regard to the horizon; for when they are in positions from the orient to mid-heaven, or again from the occident to the lower midheaven, they turn male because they are eastern, but in the other two quadrants, as western stars, they turn female.
>
> Likewise, since, of the two most obvious internals making up Time, the day is more male because of its heat and active force, and night more female because of its moisture and gift of rest, the tradition has come down that the Moon and Aphrodite are nocturnal, the Sun and Zeus diurnal, and Hermes common as before—diurnal when a morning star and nocturnal as an evening star.[23]

He adds that six of the zodiacal signs were taken as male or diurnal, six as female or nocturnal.



The Hermetic writings carried on the theme. The *Poimandres* assigns to the Primal Man the Narcissus-myth: he saw his own reflection in the Water and wished to inhabit the sphere of nature. "Then Nature, having received into herself her beloved, embraced him whole, and they mated [mixed], for they were filled with love." So man alone on earth is double, mortal and immortal. "Though in effect immortal and owning power over all things, he submits to the conditions of mortals, subject as he is to Fate. Hence, though above the composite framework [of the spheres] he is also the slave of it, male-female as come from a male-female father, and exempt from sleep as come from a sleepless father, yet conquered [by love and sleep]."[24] Note that the father-bias is now so strong in thought that even when speaking of an hermaphroditic being, the writer calls him a father. St Ephraim in his refutations of Mani writes:

> "Darkness, in effect," he says, "has loved Light," its contrary; and how should water love fire that absorbs it? or fire the water that puts it out? and how should fire love light? what use, I ask you, does it draw from it? For fire, indeed, loves fire and wind loves wind and water loves water. Or is it indeed that the nature of Darkness is male and that coming from the good, female? Otherwise what is the sense of all that: that they loved one another?[25]

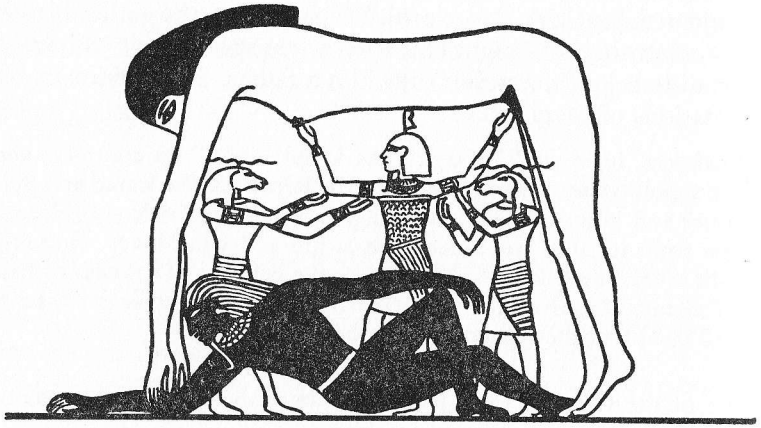
One of the Gnostic texts found at Chernoboskion thus explains the mystery of unity as two in one:

> If you would see the fulfilment of this mystery and the image of this miracle, consider the way in which bodily union is affected by the male with the woman. When the male attains to the supreme moment and the seed springs forth, at that moment the woman receives the strength of the male and the male receives the strength of the woman. . . . It is because of this that the mystery of the bodily union is practised in secret so that the conjunction of natures should not be degraded through being seen by the multitude who would despise that work.[26]

Here is the sort of reason that the alchemist would give for his secrecy. The writer continues with an interesting development of the idea of the unity of above-below. "Do you know, Asklepios, that Egypt is the image of heaven, or, better still, the dwelling of heaven and of all the powers that are in heaven . . . Our earth is the temple of the universe." A magical papyrus cries, "Open the holy temple, the cosmos founded on the earth!"

And another expands the theme in a spell for opening doors by means of Aion's name:

Open, open, four regions of the world, for the Lord of the inhabited earth is coming out! Joy for the archangels of the dekans, the angels! For he himself, the Aion of the Aions, the unique, the one over all things, traverses the place invisible. Open, door, listen, bolt, split in two, lock, at the name Aïa! Sent out, Earth, from yourself, for your master, all that you contain! For it is he himself, he who launches the storm, he who holds back the frost, the Ruler of fire. Open, it's Acheboukrom who bids you.[27]



47. Sky-goddess with consort; Shu supporting her, aided by two ram-headed figures

The Chernoboskion text goes on to draw the conclusion that as Egypt, the image of heaven, is now conquered and oppressed (by the Romans and the Christians), so the harmonious and stabilising relation of below-and-above is disturbed and the whole universe about to collapse. The day is coming, it says, when all divinity will leave Egypt for heaven because "the foreigners will invade Egypt and dominate her". The Egyptians will be prevented from worship and will be tortured; the country will be filled with tombs, not temples, "and you, O river [Nile], a day will come when you will overflow with blood instead of water, and when the bodies of the dead will be piled higher than your banks." Men will weep more for the living than for the dead, left with nothing but their language. Then, "all that I have taught

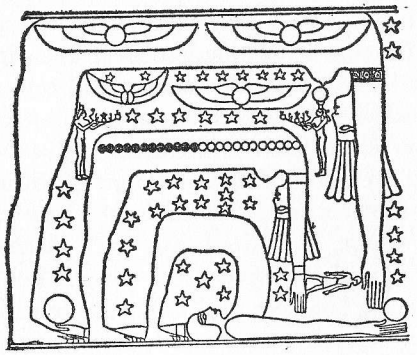


you—you, Tat, Asklepios and Ammon—will be accounted as vanity. The physical universe will break down in disorder, in "atheism, dishonour, and unreason", as the three seals of the world's old age. Then a calamity will prelude the restoration of things, when the gods "will be re-established in a town that will lie on the borders of Egypt". As usual in "prophecies", what has happened in the past or is happening in the present is attributed to the future, so that it will seem a dead prophet has foreseen the whole thing. Note the suggestion that a counter-movement will arise, located in some southern centre. The gnostic author is filled with a pagan nationalism.

With such a universal application of the sexual principle it will not surprise that even geometry comes into the scheme. Ploutarch says:

Now the better and more divine nature is made up of Three: the Intelligible, Matter, and That Formed of these Two, which the Greeks denominate Cosmos. Plato called the Intelligible "Idea, Model, Father", and Matter he terms "Mother, Nurse", the seat and receptacle of generation; and that which results from the pair he is used to call "Issue, Birth". We may conjecture that the Egyptians [revere] the most beautiful kind of Triangle [the right-angled], since they compare it with the nature of the cosmos and Plato seems to use this figure in his *Republic* when drawing up his marriage-scheme.

The Triangle too has this property: 3 the right angle, 4 the base, 5 the hypotenuse, being of equal value with the lines containing it. We must therefore compare the line forming the right angle to the male, then base to the female, the hypotenuse to the child of the two—the



48. Sky-goddess bent over to encircle, in double form, her back-bending circular husband

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one as Osiris, Final Cause; the second, as Isis, the recipient; the third, as Horos, the result. As for 3, the first, it is uneven and perfect; 4, a square with a perfect side, is the product of 2; 5 partly resembles the father, partly the mother, being made up of 3 and 2. Also the All derives its name from 5 [*panta, pente*], and to reckon is called "counting by fives", for 5 produces, when squared, the same number as that of the letters of the Egyptian alphabet and also the number of years that Apis lived.[28]

The logical result of the sexualisation of all forces and energies acting on one another is to see the cosmos as made up of male and female genitalia operating inside a womb which is thus fertilised, and to go on to the vision of the whole cosmos itself as a great womb enclosing all the lesser centres of fertilisation. The Sethians imagined the entire heaven and earth as a pregnant womb, with the naval in the middle. They said, "Let anyone examine the belly of any being soever when it is pregnant, and they will find there the imprint of heaven, earth, and all that's situated immovably in the middle." The first principle to be born was a violent wind, come out of the water and causing all vegetation; the surging of stirred waters was similar to the rhythmic spasms of the womb to bring forth its offspring at the time of completion; the whistling wind was like the Serpent with his hisses. Thus generation began from the Serpent; when the Light and the Spirit from above met with the dark chaotic Matter, the Serpent (Wind out of the Waters of the Abyss) penetrated the latter and begot Man. As the Serpent was the only form known and loved by the impure Womb, the *Logos* of the Light had to take on that form in order to copulate with Matter. The Logos descended into the body of a Virgin and relieved the anguish prevailing in the Darkness. After entering into the Womb, he purified himself and drank the Cup of Living Water that alone could redeem and transform the servile form of the body into a heavenly garment.

We see how close such a doctrine was to that set out by Kleopatra, and yet how different. Here the horror and fear of earthly life dominates, and the elixir, the *pharmakon* of life, the cup of living water, is desired only as a means of escape into another sphere; with Kleopatra the pharmakon was wanted as the redemption of life here and now, the transformation of life here and now. And it was sought, not by magical and sacramental means, but by scientific procedures, by the actual handling and changing of matter, of material conditions.



Now let us look at some alchemic formulations. We are told that the male rises east, the female sets west, and the work is accomplished by their union. The Earth is often defined as the Virgin that has to be impregnated. "The Earth is virgin and bloody, igneous and charnel." "Virgin the earth will be found in the vagina of the virgin." Stephanos in his fourth lecture cried, "Fight copper! Fight silver! Mate male and female! The copper in his contest with silver is destroyed; the silver by her combination with copper is fixed."[29] A passage in Ibn Umail attributes to Hermes an elaborate working-out of the analogy between the processes of gestation and those of transmuting:

Hermes said, Know that the Secret of everything and the Life of everything is Water, and this Water is susceptible of treatment from men and others, and in the Water is a great secret. This is the Water which becomes Ferment in Wheat; Wine in the Vine; Olive Oil in the Olive; Resin in the Turpentine-tree; Oil in the Sesame, the different kinds of Fruits in all the Trees.

The beginning of the Child is from the Water, because when the seed of man falls into the womb of the woman, the womb is locked behind it for 7 days. The seed, when it falls into the womb, becomes a Subtle Water, and it remains in the womb for 7 days till it penetrates into all the limbs of the woman through its fluidity and subtleness. Then it passes over the flesh and becomes flesh, and over the bones and becomes bones, and over the hairs and nerves [or tendons] and becomes like them; and so on with all parts of the limbs. Then it grows hardened on the 8th day, and becomes like curds. Then on the 16th day it turns red, its colour like that of flesh. Then on the 24th day, it becomes manifest with its limbs distinguishable like hair. Then on 32nd day it takes shape and becomes a human being.

He says in the Book: "Then we produced him by another creation."

On the 40th day the Soul [Breath] becomes manifest and apparent in it. Then from the 40th day blood begins to flow into the Embryo through its navel and becomes its food. Then the Soul, by reason of the blood, becomes visible and interlaces with the body and begins to grow little by little and becomes strong. Know that Water serves the Embryo in the Womb for the first three months. Then the Air serves it for the second three months. Then for the third three months Fire serves it. Fire makes it undergo coction and perfects it. When nine months are completed for it, the blood which used to give it sustenance through the navel, stops, and rises to the woman's breasts, becomes there like snow, and is turned there into food for it, after its emergence from the womb to this Middle World.

All these are [descriptions of] the manipulation of their Stone; and

in this way they manipulate it. Then understand this manipulation and these meanings.

By the Womb is meant the interior of the Pot and those things that are in the Pot. Its mouth has been closed and shut up so that it [the product] may be collected in the mouth and will not find any exit into the air. Then it will be coagulated by itself as Khalid Ibn Yazid [born about A.D. 673] says, "When I saw the Water coagulating itself I became sure that the thing was right as has been described. Do not be in doubt, for your Lord is powerful. What you have spent on it and what has been lost will surely be restored to you."[30]

We see in the last quotation that Womb and Alchemic Vessel were identified. In another passage Ibn Umail attributes to Hermes the imagery of union in marriage, followed by conception, gestation and birth. "Know that the Marriage and Conception takes place by putrefaction in the lower part of the vessel. The Birth of this Child that will be born to them will be up in the Air, *i.e.* in the head of their vessel. The head of the vessel is the top of the Dome and the Dome is the *Anbiq*."[31] We may recall also the Ouroboros surrounding the Womb in the magical gems. Similarly the Furnace was conceived as a womb from very early days. The earth was a woman, crevices and caves her vaginal orifices; stones grew in her body, and river-sources were the waters she let loose from it. The dead dwelt in her like some sort of shadowy embryos. "O you who are in the vagina of Neith, in the Hall of the Tribunal."[32]

Plinius remarks that the galena mines in Spain were reborn "after a certain time". If we look back to the earlyer days of Mesopotamian metallurgy a text from the Assyrian library of Assurbanipal shows that the processes were heavily hedged with ritual. A propitious month and day were selected; the furnace-area was consecrated; the uninitiated were prevented from coming in; the workmen were cleansed with incense and a beer-libation was offered up to the ores; sacrifices followed. A special wood, cut in the month of Ab, bark-stript and stored in a skin-envelope, was used for the fire. The term *ku-bu* is uncertain: it has been translated as divine embryos, a sort of demon, abortion, fetishes to protect the smelting. But it is used in the Creation Myth to designate the monstrous body of the slain Tiamat, from which the world is made and which is likened to a foetus. The *ku-bu* in the furnace-ceremony were thus probably the ores, considered as



earth-embryos, but they may have been foetuses and used in some sacrificial rite.[33]

In Africa today among the Achewa of Nyasaland a sorcerer brings on a miscarriage so as to use the foetus for the success of fusion; he burns it with other medicines in a hole in the ground, and the furnace is then built over the hole.[34] The Atonga throw into the furnace a part of the placenta to ensure success in smelting. The Baila sing during the work: "*Kongwe* [clitoris] and *Malaba the Black* [vaginal lips] fill me with horror. I found *Kongwe* as I fanned the flames of fire. *Kongwe* fills me with horror. Pass from me, pass far, you with whom we have repeated intercourse, pass from me." The Baikitara treat the anvil as a bride, bring it into the house as if in nuptial procession; the smith tells his wife he has brought a second wife in and sprinkles the anvil with water "so it may beget many children". While the Baila build a furnace, a lad and girl go inside and crush beans (imitate the crackling of fire); later they must marry one another.[35]

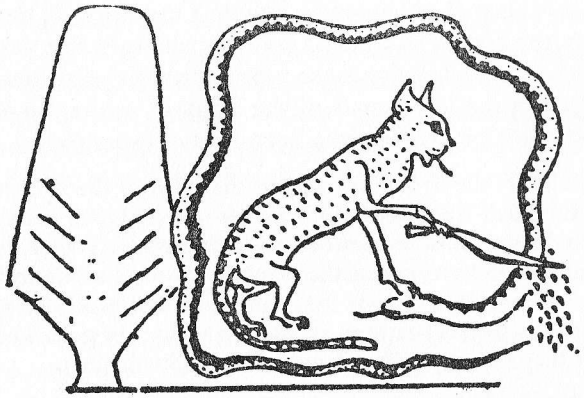
Animal sacrifices are linked with metallurgical processes. Among smiths of Tanganyika medicines are put into the furnace; children sacrifice chickens before the mastersmith and sprinkle blood on the fire, ore, charcoal, a child goes into the furnace to put the medicines in a basin hollowed in the base, deposits there two hen-heads, and covers the whole with earth. The smithy is sanctified with the sacrifice of a cock, its blood is scattered over the stone anvil with the words, "May this forge not blemish my iron, may it bring me wealth and fortune."[36] Again the smiths of Tanganyika made several kinds of hole in a kiln. The widest had the name of Mother; out of it at the end came the dross slag and roasted ore. The opposite hole was called the Father, and to it was attached one of the best bellows. The intermediate holes were children. The furnaces of the Nashona and Alunda were woman-shaped.[37] The Arabs called hard iron male and soft iron female. Weapons, as forged out of metals, were given sex, especially swords. The poet Ibn Errumi refers to the male cutting-edge and the female blade. Swords, as well as drums and bells, were given sex in China.[38] In European metallurgical terms the kiln where enamelling material was smelted was the matrix or womb, *Mutterschoss*. We find similar imagery used for many other kinds of vessels used in forging, cooking and other processes using heat.

Human sacrifice in Chinese metallurgy is suggested by the tale of Mo-ye and Kan-tsiang, man and wife. Kan-tsiang, a smith,

could not get the metal to fuse; his wife reminded him that a human sacrifice was needed. He told her that his master had brought the fusion about only by throwing himself and wife into the furnace. Mo-ye agreed to sacrifice herself if he did likewise, but they managed the matter by giving a part for the whole, hair-cuttings and nail-parings for their bodies. In another version the smith says that his dead master wedded a girl to the furnace-spirit; so Mo-ye threw herself in and the casting took place. In other accounts a smith consecrates cutlasses with the blood of his two sons, and oxen and horses are sacrificed for the production of eight swords.[39] We may recall the Kabeiric legend of the murdered brother in Greece and wonder if there were actual human sacrifices or ritual mimes of death-rebirth.

Of particular interest are the customs of some tribes in Central India. The Asurs are a tribe of smiths who seem to have lived in the North Punjab till expelled by Aryan invaders and driven to the mountains of Chota Nagpur. They have been connected with the Asur and Asuras of the Vedic hymns, those enemies of the gods in endless conflicts. In one of their myths the supreme god, Singa-Bonga, is annoyed by the furnace-smoke, and sends his messengers the birds to have it stopped. The smiths refuse and mutilate the birds. Singa-Bonga descends and, unrecognised, he persuades the Asurs to enter the furnace, where they are burned. Their widows become spirits of nature. The Munda tell how at first men worked for Singa-Bonga in heaven. Then they saw their faces mirrored in water and they knew they were like like God and thus his equal. They refused to serve and were hurled down to earth, where they fell on a place with iron ore. There they built seven furnaces. Again the smoke displeased the god, whose bird-messengers were disregarded. He came down himself as a sick old man. The furnaces broke up and the smiths asked the old man's advice. He said that they must make human sacrifices. No one was ready to die, so he offered himself. Going into the white-hot furnace, he stayed there for three days, then emerged with gold, silver and precious stones. So the smiths were keen to follow his example. They went in. Their wives, operating the bellows, were disturbed at their outcry, but the old man told them they were shouting as they divided the treasure. So the smiths were burned to ashes, and the wives were turned into spirits of hills and rocks. This last story is of special interest since it shows the idea of magical production of gold in the furnace.[40]





49. The Cat killing the Serpent at the foot of the Heavenly Tree

The notion of the furnace, the alembic or other such apparatus as wombs has many ritual links. Take the breast-shaped vases used by Maria in her *kerotakis* operations to catch the divine water. It was certainly no accident that these were called *mastaria*.[41] Later in Zosimos' vision we shall meet bowl-shaped altars. The breast-shaped vase had naturally a fertility-aspect and we find it linked with Isis, who was represented at times, says Macrobius, with many breasts or else suckling Harpokrates. In the processional fresco that ran along the three sides of the precinct of the Iseum at Pompeii, a young man carried a rounded *situla*, which symbolises the goddess's breast. Such *situlae* have an important ritual significance in Mesopotamia and Egypt and are connected with rebirth as well as fertility. The young man at Pompeii does not seem a priest; he is probably a mystes, an initiate like Lucius in Apuleius' *Metamorphoses*.[42]

To return to alchemic vessels: Stephanos writes, "True is a certain moist vapour and the dry vapour. The moist is sublimed by the *phanoi* which have nipples. But the dry vapour [is distilled] by the pot and bronze cover, as is the white vapour from cinnabar." *Phanos* usually means "torch, lamp, lantern". Olympiodoros uses it as equivalent to cup: "a cup or *phanos* of glass lying on the top." But Stephanos' description clearly sees it as a breast-vessel; vapours collect in it as milk in the breast, and come out through the nipple. It seems, however, to have also had a serpent-form. Zosimos remarks, "It is possible to fix mercury in the phanos and similar apparatus with, as it were, a serpent-shaped base"—

presumably an enclosing serpent like the Ouroboros. The alembic, in which the Stone was born, was modelled on the womb, and the retort or vessel-with-a-nose represented the placenta. Mating took place in the lower part of the alembic, while the child, the resulting spirit or *pneuma*, was born in the upper part.

> Observe closely the fire in the art and the birth of the spirit that does not remain fixed. Then also mistakes become previous irritations, the female coldness, the slow-to-move, the miscarriage. Therefore also the womb, lustful and virgin and the place of the man, all desirous whenever it may be made quick, is that which is the aphrodisiac symbol of joy and love, which is laughter. So also the melters of gold, understanding what they say, say "They laughed" . . . (Stephanos).

In the last sentence he is trying to explain, it seems, a passage from the *Diplosis of Eugenios*: "Burnt copper 3 parts, gold 1 part: melt and throw in arsenic, calcine and you'll find it brittle, the triturate with vinegar 6 days in sun, then after drying melt silver—and it laughed." Even if some very early copyist has made some mistake here over his text, the meaning is in accord with the message of Kleopatra: that both the metallic body and the alchemist suffer and feel joy in the processes. Not only do the substances mate in the alembic, the alchemist also at the same time mates with nature. The word *phanos*, we may add, with its strong suggestion of brightness, suggests a Breast of Luminous Milk, a thing of beauty and delight.

It is a short step from the mystery-cup of the divine breast to the baptismal bowl, such as the Hermetic Krater or the Cup of Living Water in Sethean theology. A Syriac poem by Narsai on Baptism (5th century) gives us an alchemic view of the bowl:

> The Supreme Artisan has produced a New Art.
> Without Composition, Man re-makes Man.
> An unprecedented invention found by divine symbolism:
> Man begets without Seed in the Womb of Water . . .
> Even if water begets reptiles and birds,
> we have never heard before of it getting humans . . .[43]

The reference to the artisan with a new art which does not use composition shows clearly that Narsai has the alchemists in mind. Men are changed in the bowl as metals are changed in the alembic. It is again only a short step, though a crucial one, to imagine the person reborn through the magical or regenerative fluid as



somehow metamorphosed into the vessel that holds the immortalising fluid. The body sloughs its mortality and becomes the divine vase itself. After death the Valentinians thought they could render themselves invisible to the powers encountered on the way up to the light. To the powers of the Demiurge they declared, "I am a Precious Vessel worthier than the female creature who made you. Your Mother knows not her origin, but I know myself." That is, they had become the vessels of regeneration and thus could reject the earthly mother. They had been reborn in the pot like the substances of Ibn Umail's alchemic account.

Above all the martyrising fire could thus transmute the body born of an earthly mother into a vessel that was wholly the father's work. We saw this idea expressed in the account of Polykarp's death.[44] Here we may add further material bearing on this point. Theodoros of Mopsuesta in the 4th century wrote on the theme of baptism: "It becomes you then to think that you fall into the water as into an oven [furnace] and that you are renewed and reformed so as to be changed into a perfect nature and to leave your old mortality and completely receive an immortal and indestructible nature."[45] Behind this imagery lies the tale of the men in the oven in *III Daniel*, which was much used as a parable of baptism and resurrection. The version made by Theodotion told how the three men "fell into the midst of the burning oven". This chapter was one of the liturgic readings in the course of the solemn vigil of Easter in the basilica of Constantine at Jerusalem while the arrival of those to be baptised was awaited.[46]

In the *Brihadaranyaka Upanishad* we read: "And as a goldsmith takes a piece of gold and gives it another form, new and more beautiful, in the same way this I, after rejecting its body and chasing out all ignorance, makes it into a new and more beautiful form, whether it resembles the Ancestors or the Ganharvas or the Devas or Prajapati or the Barhman or other beings."[47] The Christians used similar language of the glorified body. Kyrillos of Jerusalem in his 18th *Catechism of Baptism* says that the body will survive in eternal life, but transformed, "just as iron in contact with fire becomes fire". The bodies of the just will shine.[48]

The Christian writers on baptism pondered much on *Daniel* (xii, 3): "They that are wise shall shine as the brightness of the firmament," and on *I Corinthians* (iii, 15), which they misunderstood because of their obsession with the cleansing and transmuting fire: "If any man's work shall be burned, he shall suffer

loss; but he himself shall be saved; yet so as by fire." The actual reference was to ordeal.[49] John of Lykopolis (about 394) wrote:

> Exactly as iron, put in the fire—and the fire penetrated it and is incorporated with it—is united with the fire and takes its likeness and its colour, and does not show itself under its old aspect, but becomes like fire, since the iron has been absorbed by the fire and the fire by the iron, and they have become one, in the same way when Christ's love has entered into the soul, that love which is the living fire burning the straw of sin to deliver up the first, the soul that was old becomes new, it was dead and it becomes living; and the likeness of nature is changed to the likeness of God.[50]

The idiom was already well worn. Methodios of Olympos (about 311) compared Man, God's masterpiece, to a fine statue made by a skilled artist. Destroyed by an evil-minded person, it can be recast and remade. It is the same with Man deformed by the Devil. "The recasting of this statue is here the death and dissolution of the body; the renewal and restoration of matter is here the resurrection. Further, restoration is easier work than the original creation. Look still at the artist. It is not so hard to give a bronze vessel the same form after having cast it as to make something new from raw matter. That demands more work. The metal must first be burned, then cast: that is, purification and then the creation of an artistic form." Augustine took up the symbolism in his *Enchiridion*. However, though many early Fathers compared the creative activity of God to that of a skilled worker, they usually chose the potter.[51]

In later times, however, the theme of the rejuvenating smith was common in folktales, popular plays, and the like. A typical example is the following from Middle English. A smith in Egypt is rich and proud, an unequalled master. To punish his pride, Jesus Christ comes and asks him to forge an iron rod that can show the way to a blind man. The smith wants to know how that is possible. Christ replies that he can do it, as well as giving youth to the old. The smith gets his old, blind and lame mother-in-law, and at Christ's orders puts her on the fire till she is incandescent without feeling pain. Christ then places her on the anvil and forges her without breaking a bone till she is as she was at thirty years. He then refuses to hand on his lore to the insistent smith. The latter, however, tries his hand on an old, blind, paralysed woman and smashes her up. Scared, he runs off and prays; Christ



in pity blesses the woman, who revives. Christ promises the man that he will be the mastersmith but must not burn people. In variants, Christ, wandering with St Peter, takes off a horse's feet; the smith imitates and fails.[52]

The motive of the apprentice or aspirant who tries to imitate some magical acts and fails is very old. Philostratos in his *Life of Apollonios* has the story of the apprentice who tries to use the bucket of the master-magician to raise water and cannot stop it. Ailian tells a tale of the temple of Asklepios at Epidauros with its miraculous cures. A woman wanted to be cured of tapeworm; a servitor cut off her head and removed the worm, but could not put the head back; the god, summoned, duly did the miracle. This tale was a piece of Epidaurian propaganda to outdo a tale from Troizen. Circumstantial details were added and we hear of the woman, Aristagora, lying all day with severed head.[53]

Behind all the ideas and images of a forged immortal body of metal or gold there lies the ancient idea of gods whose incorruptible bodies were made of such substances. We noted such ideas at the outset of this book. They went back to the days of the Pyramid texts. The god is indistinguishable from his deathless image. A New-Kingdom address to Thoth (in the form of a squatting ape) declares:

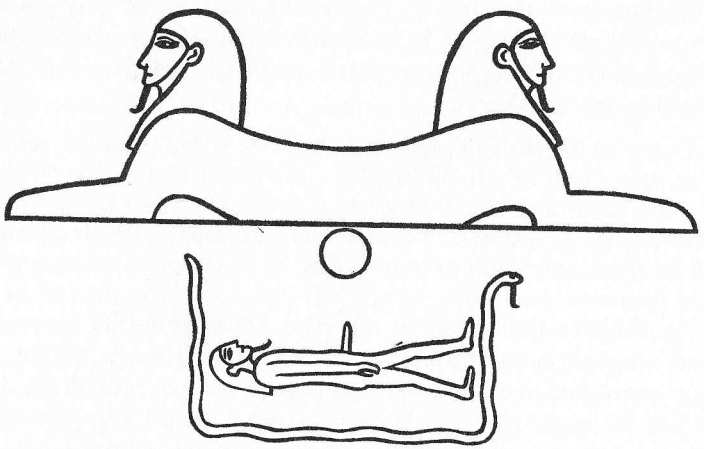
> Ape with white hair and pleasant form, with friendly nature, beloved of all men. He is of *sehret*-stone, he, even Thoth, that he may illumine the earth with his beauty. That which is upon his head [moondisk] is of red jasper and his penis of quartz. His love leaps [?] on his eyebrows and he opens his mouth to bestow life.[54]

Ptah blesses Ramses II in the Abu Simnel temple, saying, "I have wrought your limbs of electron, your bones of copper, your organs of iron." And a magic papyrus has a spell entitled: "What the eight great gods of primordial origin say when they render homage to the god who is among them, whose bones are silver, whose flesh is gold, and whose hair is a true stone of azure." In the ritual of embalming:

> In a long speech the deceased is addressed and told the liquid [immersing his backbone] is "secret", and that it is an emanation of the gods Shu and Seb, and that the resin of Phoenicia and the bitumen of Byblos will make the burial perfect in the underworld, and give him his legs, and facilitate his movements, and sanctify his steps in the Hall of Seb. Next gold, silver, lapis-lazuli, and turquoise are brought to the

deceased and crystal to lighten his face, and carnelian to strengthen his steps; these form amulets which will secure for him a free passage in the underworld. Meanwhile the backbone is kept in oil, and the face of the deceased is turned towards the heavens; and next the golding of the nails of the fingers and toes begins. When this has been done, and portions of the fingers have been wrapped in linen made at Sais, the following address is made to the deceased:

"O Osiris, you receive your nails of gold, your fingers of gold, and your thumb of *smu* [or *usasm*] metal; the liquid of Ra enters into you as well as into the divine members of Osiris, and you journey on your legs to the immortal abode. You carried your hands to the house of eternity, you are made perfect in gold, you shine brightly in *smu* metal, and your fingers shine in the dwelling of Osiris, in the sanctuary of Horus himself. O Osiris, the gold of the mountains comes to you; it is a holy talisman of the gods in their abodes, and it lightens your face in the lower heaven. You breathe in gold, you appear in *smu* metal, and the dwellers in Re-stau receive you; those who are in the funeral chest rejoice because you have transformed yourself into a hawk of gold by means of your amulets of the City of Gold."[55]



50. Serpent enfolds ithyphallic Osiris

There is yet one more point about the urgent desire that was felt to transform the flesh. The male wanted to become a statue of gold, a thing of purified metal, a vase of fire-hardened clay, no longer subject to the accidents and corruptions of the flesh. The female wanted all that too, but she, the "weaker vessel", started with a disadvantage and had to become male in the process, so



utter was the contempt for the mother-body. There was a belief that all female elements must become male in order to unite with the angels and enter the Fullness, the *Pleroma*. Thus the gnostic Theodotos believed. And in *The Gospel of St Thomas*, used by some Gnostics (such as the Naasenes), the last *logion* runs:

> Simon Peter says to them: Let Mary go from our midst, for women are not worthy of Life. Jesus says: See, I will draw her so as to make her male so that she also may become a living spirit like you males. For every woman who has become male will enter the kingdom of heaven.[56]

The rejection of the mother, the female, appears in the saying of Jesus: "Woman, what have I to do with you?" Tertullian condemns women: "You are the gateway of the Devil, you are the unsealer of the forbidden tree, you are the first rebel against the divine law, you are she who persuaded him whom the Devil was not strong enough to attack. So easily did you shatter the image of God in man." And so her only hope was to cease being female. On Judgment Day "women will have the same angelic substance, the same sex as men". Jerome taunted women with trying to make themselves like men as the result of such condemnations. They "change their garb and put on men's dress, they cut their hair and lift up their chins in shameless fashion". St Gregory of Nazianzan coins the paradoxical phrase: "to be male [*andrizesthai*] in female matters".[57]

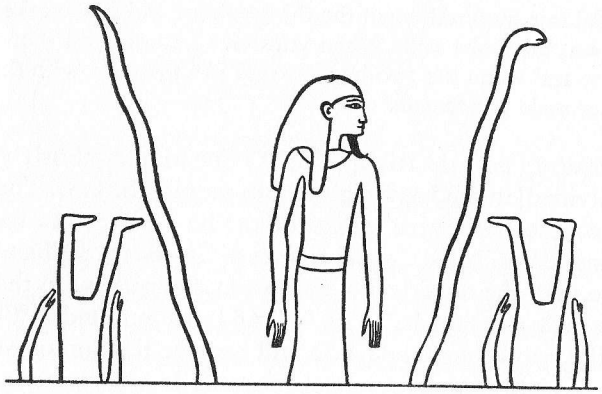
Accompanying this wish to abolish femaleness was a wish to abolish sex itself. In *The Gospel according to the Egyptians*:

> When Salome inquired when the things about which she asked would be known, the Lord said: When you have trampled on the garments of shame and when the two become one and the male with the female is neither male nor female.

*The Gospel of Philip* declared, "Christ came to re-establish what was thus [divided] in the beginning and to reunite the two. Those who died because they were in separation he will restore to life by reuniting them." *The Second Epistle of Clement*:[58] "When the two shall be one, the outside like the inside, the male with the female neither male nor female." The *logia* of Jesus repeated, "When you make the two become one, you will become the Son of Man, and if you say, Mountain remove yourself, it will remove itself." And there were close parallels in the New Testament. *Galatians*

(iii, 28) stated, "There is neither male nor female, for you are all one in Christ Jesus."[59] It followed that in the beginning there had been no sex.[60] Simon Magos called the primordial spirit male-female. The Naasenes saw the celestial Man, Adamas, as arsenothelys; and every man still held inside himself the power of becoming a celestial hermaphrodite like the Logos. *The Epistle of Eugnostos* the Blessed saw the Son as the first generative Father, also called the Adam of Light; he mated with himself, with his Sophia, and produced a great male-female light "which is by its male name the Saviour, creator of all things, and by its female name Sophia, the all-mother, also called Pistis. From these two are born six other pairs of spiritual hermaphrodites, who produce 72, then 360 other entities."[61]

The Mother is thus smuggled into the cosmogony as the female aspect of himself with whom the Son mates; but she is tolerated only in this disguised and inferior form. As the deities with whom union was sought were always conceived as male—in the Christian formulation, triply male—the notion of male and female being absorbed into unity was felt emotionally as a transcendence of femaleness and thus an elimination of sex. Hence the extreme hostility to women that keeps breaking through the abstractions. Women thus had a double urgency in the desire to rise above the flesh; and perhaps it was natural that a woman, Maria, led the way in devising the Pot or Transformative Womb by which Matter might, it was hoped, be changed and lifted on to a higher level—that of the stable purity of gold.



51. Osiris breaks out

# 14

# Agathodaimon

WE now come to what is perhaps the most problematic figure among all these problematic figures, the founders of alchemy: Agathodaimon. The name is plain enough in meaning: the Good Spirit; and we have seen that Spirit already turning up in a number of connections, though not with any clear character. There was a geographer Agathodaimon, apparently of the 2nd century A.D., but there is no reason to think this man an alchemist. Under Agathodaimon's name we have an alchemic commentary addressed to Osiris and dealing with *The Oracle of Orpheus*, another of the 2nd-century apocrypha, which was held in high esteem by the Gnostics. There he speaks of the art of whitening or yellowing metals as well as giving various recipes.[1] We find elsewhere an aphorism of his: "After the refinement of copper and its blackening and later whitening, there will be the solid yellowing."[2] He is also linked with Hermes in the Riddle of the Stone.

Olympiodoros says, "Some say he is an ancient, one of the old philosophers of Egypt, others, a mystic angel or good *daimon*, Egypt's Protector. Others call him the Heaven, as his symbol is the image of the world. Indeed the Egyptian hieroglyphs, wanting to denote the world on obelisks in sacred characters, depict there the serpent Ouroboros."[3] We may surmise that Agathodaimon was connected with Ouroboros because of his own serpent-form. Certain Gnostics, who adored the serpent as his emblem, kept domestic snakes called *agathodaimones*, house-guardians. The Agathodaimonites, indeed, have been taken for alchemists.[4]

We shall soon have more to say of Agathodaimon as a snake. For the moment let us look at him as a person linked with Hermes. A Discourse of Hermes to Tat, *On the Common Intellect* (*Nous*), states:

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Is not the adulterer bad, the murderer bad, and so on with all the others? The man who has the *logos* [word], my child, does not suffer through having committed adultery, but he suffers as if he had; not through having killed, but as if he had killed. For if it's not possible to escape the condition of change any more than that of birth, he who possesses *nous* has the power of getting away from evil.

That's why, my child, I have always heard Agathodaimon say—and if he had written and published it, he would have rendered a great service to the human race: for he alone, my child, because as the firstborn god he had truly contemplated all the assemblage of beings, would utter divine words—I have then heard him say one day that "All is One, and, above all, the Intelligible Beings; that we live by the power, by the energy, and by the Aion; and that the nous of the latter, which is also its *psyche*, is good."[5]

*Psyche* here means the I, perhaps the Double or *Ka*. A magic papyrus says: "You are the soul of the Daimon of Osiris, [the soul] which revels in every place." And Ploutarch calls Apis the image, *eidolon*, of Osiris' soul.[6] "All is One" we have met as a basic alchemical axiom, which perhaps goes back to Herakleitos: "Listening not to me but to the *Logos*, it is wise to acknowledge that all things are one."[7] And it has been suggested that a gathering of Herakleitan "oracles" served as the basis for an Egyptian collection of Agathodaimon's *logia*.[8] Kyrillos of Alexandreia knew of a *logos* of Agathodaimon to Osiris.[9]

We have three passages from Kyrillos in which the name appears. In the first, indeed, it is only used in an address to Hermes by the servitor of an Egyptian sanctuary, who wants to know what the *Logos* is. Hermes tells him that it is "generative and demiurgic". In the Hermetic treatise, *The Key*, we are told that the universal *nous* is the Agathos Daimon.[10] With the second passage from Kyrillos, however, we seem to touch a more distinct character, whether deity or man. Hermes is talking to Asklepios.

Then Osiris asked, "Well, very great Agathos Daimon, how did the earth appear in its entirety?"

The great Agathos Daimon replied, "According to a system and a drying-out, as I have said: the mass of waters received, from that instant on, the command to recoil upon themselves and the earth appeared in its entirety muddy and shaken with tremblings. For the rest the sun spread out its light and did not cease burning and drying out things thoroughly, and the earth was solidly fixed in the midst of the waters, surrounded by water on all sides."[11]



In the third passage Agathodaimon is again instructing on the origin of things:

And Osiris said, "O thrice-great Agathos Daimon, by what cause has risen this great Sun that we see?"

The great Agathos Daimon replied, "You want me, Osiris, to set out the sun's generation—by what cause it has risen? It has risen by the providence of the Master of all things."[12]

Again the discourse turns to the creative *logos*. All these passages do not, however, give the shadowy figure any clear features. He appears as a vague doublet of Hermes, except perhaps that his main concern is with the creative or cosmogonic process, which is suitable enough for an alchemist. And this point brings us to Kamephis, who seems identified with him, and to a passage cited from the *Kore Kosmou* earlier in another relation, that of the Black Earth.[13] Isis tells Horos:

You hear here the secret doctrine that my ancestor Kamephis learned of Hermes the Memorialist, who relates all the facts; then [I learned them] from Kamephis, our ancestor of all, when he honoured me with the gift of the Perfect Black; and now you from me.

This Kamephis, Kmephis or Kmeph, is in effect an ancient god under his various Greek forms. The name should correspond with the Egyptian Kamutef, which denotes the God Father-of-his-Mother: that is, the first unbegotten begetter, *autogennetos*, who is identified with Amum-Re-Kamutef or with ithyphallic Min. Kamutef is thus a form of the ancient hermaphroditic demiurge whom we discussed in the last chapter.[14]

His only appearance in a Greek text seems in Damaskios, in a passage that deals with Three Kamepheis, a demiurgic trinity.[15] The first god came from the original pair of *archai*, principles: the water and sand of Egypt. The second came from this first; the third from the second. The triad constitutes the intelligible world in its totality. Damaskios says that such is the account given by Asklepiades, apparently the Egyptian whom the *Souda* describes as having a deep knowledge of his country's theology and who wrote hymns to his native gods. He is said to have written a book on the concord between the different religions; and Suetonius gives him the name of Mendes – so that presumably he came from the same town as Bolos.[16] The third Kamephis, we are told, was the Sun and also the Intelligible Intellect.[17] We see

in the Kamepheis one of the forms of the Neoplatonic trinity. In the *Kore Kosmou* the name seems chosen so as to make Isis' revelation go infinitely back in time—just as the pseudo-Manethos, cited by Synkellos, links his *gnosis* with books in the sanctuaries of temples that date back to the second Hermes, son of Agathodaimon and grandson of the first Hermes. In the *Kore Kosmou*, indeed, the author as a result has produced an illogicality: Kamephis is the most ancient of all, yet he gets the *gnosis* from Hermes. Efforts have been made to reorganise the text so as to make him the first owner of the lore which he hands on to Hermes, who hands it on to Isis; but they are probably unnecessary,[18]

Kamephis-Kmeph is further somehow entangled with Khnum-Kneph, so that Kamephis merges with the ram-headed creator-god of Elephantine and the First Cataract, who was worshipped in many sanctuaries. Khnum made men and women on his potter's-wheel; "Maker of things which are, creator of the things which shall be, the source of things which are, father of fathers, mother of mothers" he was called in the New Kingdom, and thus appears as another hermaphroditic demiurge.[19] The line of descent here, of Kamephis from Khnum, is not all at clear and has been denied.[20] However, the link of Kneph and Agathodaimon is attested by Philon of Byblos: "The Phoinikians call it [the Living Snake] the Agathos Daimon while the Egyptians name it Kneph and attach to it the head of a falcon." The same Falcon-headed Snake is identified with Kneph in the pseudo-Persian source found in Philon and John Lydos.[21]

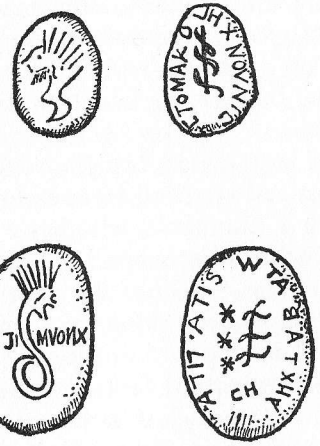
The magical gems do much to fill out the picture. Here indeed we do find the god Khnum linked with a serpent: On one side we see a bearded serpent coiled on the right; on the reverse is an inscription *Chnoubis Nabis Bienout*—a corruption of a common formula, *Chnoubis Naabis Biennouth*, which is normally met in connection with the bearded serpent. Chnoubis is a late variant of Khnum.[22] *Naabis* seems linked with the Egyptian root, *nhp*, which denotes the potter's-wheel or else an hypostasis of the god existing independently or under the form *Khnum-Nph*.[23] *Biennouth* corresponds to an Egyptian term meaning the soul-of-the-god. This name suits Khnum in particular, since the Egyptian for Ram was homophonous with the word for the Soul. The Egyptians liked this sort of serious pun, which was felt to reveal hidden connections; here they built up theological subtleties on the



similarity of sound, making the Divine Ram the Soul of the Gods and associating the four forms he assumed in his four sanctuaries with the four great elementary gods.[24] Thus we find that each term of the inscription on the gem links with Khnum.

But how did the serpent thus come to merge with a god who was supremely ram-headed? Here we seem to find a fusion of Kneph, normally shown with a lion's head, and Agathodaimon, who is bearded. How it occurred will become clearer as we go on.

Agathodaimon as a snake was naturally associated with the Earth. This relation is brought out by another intaglio where we see him coiled up with a *pschent*-crown on his head and the word, *Gaia* (Earth). There may be a reference to his creative forces here; the *pschent* recalls royal power—Manethos calls the third ruler of the 1st dynasty Agathodaimon.[25] On a third intaglio an Ouroboros encircles the womb, which is closed with a five-toothed key and surmounted by Isis, Chnoubis the lion-headed snake, a dog-headed mummy and Nephthys. Here Chnoubis is clearly the creator-god set between two goddesses associated in the ceremonies that attend birth. Inside the field is inscribed *aei o ē ouō*, and round the Ouroboros, *soroormer-hergar . . . riourin*, in which we see fragments of a formula often linked with amulets protecting the womb.[26] What matters for us here is the evident connection of Khnum-Kneph-Chnoubis. The gems show us the welter of often strongly-felt associations going on busily at the



52. Chnoumis gems

popular level in the Graeco-Roman world. We may add that in a magical papyrus we meet both the Ouroboros and Chnouphi; and that in the Greek alchemic Lexikon *Cnouphion* is given as a synonym of the alembic.[27]

Further aspects of Chnoubis can be seen in other magical gems. As we noted above, he is one of the gods that guard the womb (which was regarded rather as a thing or force in itself, liable to move about and cause much damage). He also helped the stomach. A talisman against stomach-trouble is doubtless to be seen in a grey-blue piece of chalcedony, shaped like a peach-stone or persea-seed, on which is cut the Chnoubis-snake with nimbus and seven rays—*pesse pesse* on the other side (*digest! digest!*—the word means "ripen or soften by means of heat"). Galen, writing of the medicinal powers of certain minerals, states:

> The testimony of some authorities attributes to certain stones a peculiar quality which is actually possessed by green jasper. Worn as amulet, it benefits the stomach and oesophagus. Some also set it in a ring and engrave on it the radiate serpent, just as King Nechepso prescribed in his 14th Book. I myself have made a satisfactory use of this stone. I made a necklace of small stones of that variety and hung it from my neck at just such a length that the stones touched the position of the cardiac orifice. They seemed just as beneficial even though they lacked the design that Nechepso prescribed.[28]

Galen thought the stone radiated some virtue, but deprecated the value of the magical inscription or design. The snake-design he speaks of was no doubt the typical Chnoubis, a thick-bodied, lion-headed snake, but we do find some rayed snakes wholly serpentine in form.

The rays are of importance, bringing out the astrologic connections. In the sacred book of Hermes to Asklepios, the first Dekan of the Lion is Chnoumis, who has a lion-head set on up-rearing coils, and who rules over all affections of the heart. But the third Dekan of the Crab has the name Chnouphis, with a design, however, of a bust resting on a base and owning two female faces turned in opposite directions.[29] In Hephaistion of Thebes, Chnoumis is the third Dekan of the Crab and is helpful as a *phylakterion* of the stomach. Charkhnoumis is the first Dekan of the Lion but nothing is said of his appearance or powers. His name may appear in forms Cholkhnoubis and Chrachnounis



found on a few amulets of this type.[30] In the work *About Stones* by Sokrates and Dionysios we read:

> Engrave on it [some sort of onyx] a serpent coiled with the upper part or head of a lion, with rays. Worn thus it prevents pain in the stomach; you will easily digest every kind of food.[31]

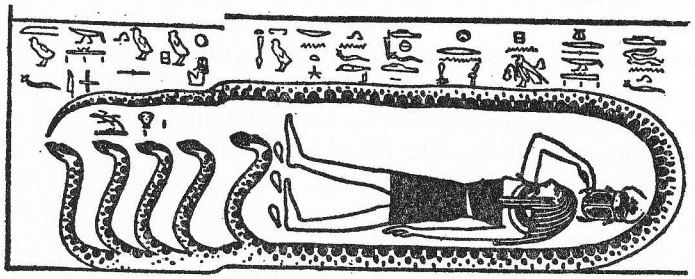
Generally the rays number seven or twelve; at times they are six or else twelve in six pairs; occasionally there are seven pairs. When there are seven, the seven vowels are sometimes set at the end of the rays or between; we also find the letters of Chnoubis thus treated. Several times the serpent is on or just above a little altar or base. Variations of the serpent-form include a human trunk and arms under the lion-head; the man-section wears a cuirass, with a short-sleeved tunic under it, which falls below as a kilt; the lower part of the body consists of large snake-coils either side. The head has six rays; the right hand holds two short daggers pointed upwards, the left has two stalks of grain. (The stalks are common in representations of Agathodaimon, thrust into the coils of the snake-tail.) In one instance the body is nude save for the kilt, and the hands hold a sword and a palm-leaf; in another, there are two swords, with the words *Chnoubis naabis biennouth*. (The use of military costume, imitating the statues of Roman emperors, is not uncommon for Egyptian gods, *e.g.* Anoubis. And we meet terracottas of Isis which give her human arms and a tunic from which a snake-coil emerges.) In other variants a human-headed snake twines round five small ovoids or a snake with lion-head has several eggs around or between his coils. These snakes must be guarding the eggs. Yet another variant has the snake with rayed human head and body apparently swathed as a mummy. On the reverse of one Chnoubis design is the inscription, "Keep Proklos' stomach healthy." Another prays, "Place the womb of so-and-so in its proper place, O Circle of the Sun."[32]

One ordinary Chnoubis stone has on the reverse, as well as *Nabis Biennouth*, "Water for thirst, Bread for hunger, Fire for cold." The phrases are probably liturgical. For instance, at the time of Akhenaten, we find:

"You are the father of the motherless, the husband of the widow. Pleasant it is, the uttering of your name. It is like the taste of life. It is like the taste of bread to the child, a loincloth to the naked." An Ethiopian hymn, used on Palm Sunday, declared:

"He is bread to the hungry, spring-water to the thirsty." And we may compare a prayer to Thoth in the New Kingdom:

> You great dom-palm, sixty cubits high, on which are fruits. Stones are in the fruits and water in the stones. You who bring water to a place far away, come, deliver me, the silent one. Thoth, you sweet well for one who thirsts in the wilderness. It is closed to him that finds words, it is open to him who keeps silence.[33]



53. The Sungod of Night surrounded by the Five-headed Serpent of Many Faces; on his head the Beetle of Khepri, the rising sun of the next day

The formula on the Chnoubis stone reminds us of the alchemist aim of driving out hunger.

We may now try to draw together some of these scattered pieces of evidence. Agathodaimon, given a snake-form, becomes a demiurge as well as protector; in his Hermetic role he is linked or merged with Kamephis or Knēph (Kamutef); and one literary source calls Knēph a falcon-headed snake. Then comes the more difficult merging with the demiurgic ram-headed Khnum, who becomes linked with Knēph and Kmeph. A magical lion-headed snake Chnoubis is in turn associated with Khnum. That these linkings went on at the popular level revealed by the magical texts and gems is supported by the fact that it is in a magical papyrus we find Khnum as a solar god called Kmeph with the form of a huge serpent. Taking over from the Theban demiurge, he has shed his ram-head in favour of the lion, a strongly solar beast.[34]

Certainly sound-similarities played a large part in these identifications; but there were also astral influences. Snake-forms were common enough in Egypt, though there seems also a Greek element in snake-Agathodaimon; the radiate lion-head is solar and strongly Egyptian. Astrological names and images played a



considerable part in the series of associations we are examining, though the process was never at any point simple and direct. Chnoubis of the amulets had doubtless no original relation to Khnum. He was merely one of the Dekan-gods who presided, each over a third of a zodiacal sign: over 10° of the circle.[35] The Dekans determined the night-hours by the passage of certain stars or constellations through a number of fixed points. The system was taken over by Greek astronomers under the influence of the work attributed to Nechepso and was set out in two treatises, one under the name of Hermes Trismegistos, the other under that of Hephaistion of Thebes. Chnoumis, we noted, was a Dekan-god of the Crab; an astrologic text, which gives him this name, also describes an amulet of the Chnoubis-type for persons whose birthday falls under the Chnoumis-dekan. Such a persons were particularly liable to digestive troubles. Chnoumis as a name is almost certainly linked with Khnum; but it seems unlikely that the Chnoubis-amulets were at first devised under astrological influences. Perhaps the name Chnoumis was attached to a Dekan after the amulets were being turned out, and represents an effort to bring Khnum into the Kamephis-Agathodaimon sphere. In any event it is notable that a sign, very common on Chnoubis-amulets, is also linked with Chnoumis-Knm of the Dekan. On Egyptian monuments it appears as an upright snake crossed by three horizontal snakes. On amulets it is shown as three similar wavy lines crossing an upright straight line.[36] (We seem here also to touch a version of the *Imakh*-caduceus which we discussed.)

However we analyse the dekan-gods, Chnoubis and Chnoumis, and the ways in which they came into our complex, they certainly ended as part of the Agathodaimon-system. We get a further insight into the syncretic tendencies at work by looking at two more texts. Iamblichos, dealing with Hermes' account of the universe, tells us of "the most ancient principles of things"—the self-born Father dwelling in the solitude of his own unity—which are set above the ethereal and igneous gods and the celestial gods. Of the igneous gods Hermes has left a hundred works, of the etherial another hundred, and of the celestial a thousand. Iamblichos goes on:

> In another order he sets the god Knēph at the head of the celestial gods and calls him the intelligence that thinks itself and turns towards itself other thoughts. He puts before him an indivisible being that he

names also the firstborn and Eiktōn; in him is the first intelligence and the first intelligible, which is worshipped by silence alone. Besides there are other chiefs of the demiurgy of visible beings; for the intelligence is demiurgic, guardian of truth and wisdom; descending into generation and bringing into the light the hidden power of secret discourses, he is called Amōn in the Egyptian tongue; accomplishing all things without falsehood and artistically, truthfully, he is called phta—the Greeks change Phta into Hephaistos, attaching him only to his art; as creator of the good, he is called Osiris and takes according to his various powers different names.

Knēph-Khnum here appears as supreme demiurge, taking over some of Ptah's qualities as creator by means of thought and becoming a celestial god, perhaps through Chnoumis of the Dekans. The Egyptian basis of the name Knēph means "he who accomplishes his time". Chnoumis is the snake-creator playing a part in the Theban cosmogony; Porphyrios knows him as a demiurge connected with the cosmogony of the Primeval Egg, but gives him a human shape. Indeed there is a point where the entanglement of identifications in the late period becomes confused beyond sorting out. There is a further link with Ialdabaoth Sacla, Gnostic demiurge, whose name sometimes alternates with that of Chnoumis in astrological texts.[37] We see how this sort of identification went on pullulating in the popular imagination from a Prayer to the Sun:

I invoke you, greatest of the gods, eternal lord, ruler of the world, you who are on the world and under the world, powerful ruler of the sea, who glitter at the moment of day, who rise up for the whole world in the east and who go to rest in the west. Come, you who rise coming out of the four winds, gracious Agathodaimon, who have taken for festival hall the entire sky.

I invoke your sacred names, great and hidden, that you rejoice in hearing. Under your beams earth has blossomed, the plants have borne fruit by grace of your smile, at your command the living have begotten other living beings. Give glory, honour, favour, success, and magic force to this stone, for which today I carry out the consecration [or, this phylactery I consecrate] against NN. I invoke you who are great in heaven, Sabaoth, Adonai, great God, glittering Helios who shine on all the earth.

You are the great Serpent who walks at the head of all the gods, you hold the first place in Egypt [the first nome of Upper Egypt, that of Elephantine, Khnum's seat], which is also the last of inhabited land [at the First Cataract in the far south]. You have begotten yourself in

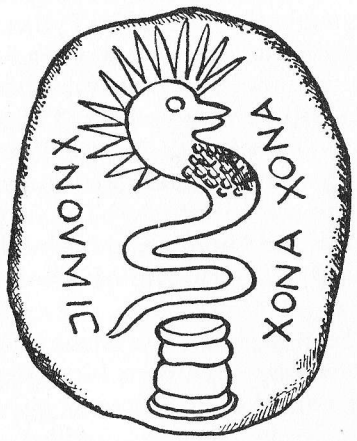


the Ocean, Psoï, god of gods, you are he who manifests himself daily, who sleeps in the northwest of the heavens and who rises in the southeast . . .

Yes, Lord Kmeph. I call upon earth and heaven, light and darkness, and the great god who has created everything, Sarousis, you, Agathodaimon who aid me, grant me complete success in this operation by means of this ring and this stone.

(While you operate, say: There is only One Zeus Sarapis.)[38]

Dragon-snake and Lion, a magical papyrus tells us, are alike "physical principles of fire". In the sun-prayer, Kmeph, Agathodaimon, Helios, Psoi (Psois) are all directly identified with one another. Psois deserves a glance, for he helps us to understand how Agathodaimon became integrated in the Egyptian system. He was one of a pair of old deities, having as consort Thermouthis (Ernutet)—a name traditionally given to Pharaoh's daughter who found Moses. As the deification of good luck (*Sai* in Egyptian), he was naturally merged with Agathodaimon. As Psai was the Egyptian name for the city Ptolemais, we may deduce that he was the divine snake or guardian there. Ptolemaios I had founded that city; and if Psois was known in it, we may guess that he was already prominent at Alexandreia and perhaps already identified with Agathodaimon. Certainly the latter was established in the capital by the 3rd century B.C. and his female counterpart, Agathe Tyche, was most likely equated with Thermouthis. At




54. Gem with Chnoumis above an altar and inscription, on reverse "I ever I am the Good Spirit."

some time, probably late in Hellenistic times, the pair of good-luck deities were identified further with Sarapis and Isis (who had her serpent-form and was also a Tyche, a Fortune). While Psois was rather swallowed in the new equations, Thermouthis survived better in separate form—as indeed also Isis grew in importance at the expense of Sarapis. The females of the protecting house-snakes were called Thermoutheis, and were thus Isis' ministers in punishing sinners. The two snakes, by the way, that Ptolemaios, a sober historian, says guided Alexander the Great to the Oracle of Siwa and back across the desert, were certainly meant as a divine sign and may be taken to represent Psois and Thermouthis. If this is so, it looks as if Psois was already identified with Sarapis and stood for the Agathodaimon of the new political dispensation.[39]

We also find Thoth brought in. A haematite gem shows a deity with neck and head of ibis and crowned snake; on the reverse the *Iaō* palindrome, *Chnoubis*, and the words *pesse pesse*, showing that amulet was for stomach-troubles. The odd figure may be taken as a fusion of Hermes-Thoth and Agathodaimon, as found also in the inscription *Thaut Psae* on an amulet reverse, with Thoth's ibis on the other side, holding a caduceus under its wing and bearing on its head a tiny figure of Harpokrates. *Thaut Psae* gives us a dialectal form of Kopt words meaning "Thoth Fortune of Thoth" (Agathodaimon).[40] A chrysolite shows a crowned snake, with Isis standing in a shrine on the obverse; the snake might thus be Agathe Tyche or Thermouthis.[41] A figure on a haematite amulet again shows a fusion of Chnoubis and Thoth; it has two heads, one of an ibis with *atef*-crown, the other of a bearded serpent with pschent. The design is encircled with an inscription *arponchnouphi bri[nta]tēnōphi ermithouth*; and it has been shown that the second term is applied to Choumis-Choubis especially in a solar aspect.[42] The first may contain the Egyptian Har [Horos] and Chnoubis; the third, Hermes-Thoth. In any event *Ermithouth* is an anagram of *Thermouthi*, the vocative of Thermouthis.

Chnoubis is further a protector against the Evil Eye; and among the epithets most usually applied to him are *gigantorhektes* and *barophita*. The first we find as *gigantophontes*, *gigantopantorhektes* and *gigantopniktorhektes*: he is called giant-killer, giant-annihilator, giant-render, and apparently giant-throttler. *Barophita* seems to mean serpent-crusher.[43]



We could follow up the variants and the shades of significance in the amulets much further; but enough has been said to bring out the main points and to show how important was this Chnoub-Kneph-Khnum figure in the world of magic. Exactly how the fusions came about, it is hard to say; but in part through astrology, in part through the sycretisms of magic, the serpent-creator of Theban cosmogony was merged with creator Khnum; Agathodaimon with his head of a bearded serpent was drawn in; Chnoumis as first Dekan of the Lion gained himself a lion-head—Hermes the astrologer described him, "He has a leonine face emitting solar rays; his whole body is that of a serpent rolled in spirals, turned upwards." But probably the general tendency towards solar identifications has helped to bring in the lion-image. We saw how snake and lion were now both solar creatures, and the sun-prayer showed how Agathodaimon, Kmeph and Helios were connected. All these developments were of the Graeco-Roman period, indeed largely the product of the Empire; and the identifications cannot be refuted because they cannot be found to exist in earlier Egyptian religion. What is obscure is the precise step taken to bring this and that figure together; the sequences are lost in the confusion of popular fantasies.

This investigation has not been irrelevant, since it has shown us further the workings of thought and emotion in the shadowy underworld of culture in which alchemy was being nourished; but it has led us away from, rather than towards, any historical figure who can be given a role in the early history of alchemy. There is one area, however, in which Agathodaimon does have some claim to represent such a figure, but that is far from Egypt, among the Sabians of Harran in northern Mesopotamia. We have already briefly noticed them, and now we must pay them some closer attention.

Harran, a Syrian town, lay on the big western bend of the Upper Euphrates and survived till the 10th century A.D. as the last outpost of Sumerian, Hittite and Babylonian cultures. In the process it went through many changes. About 528 B.C. it was incorporated in the empire of the Medes and Persians; and it has been suggested that in the following Achaimenid period, when Egypt also became a part of that empire, a widespread fusion of cultures went on, which laid the basis of Iranian ideas in Egypt. A further intermingling of cultures went on in the

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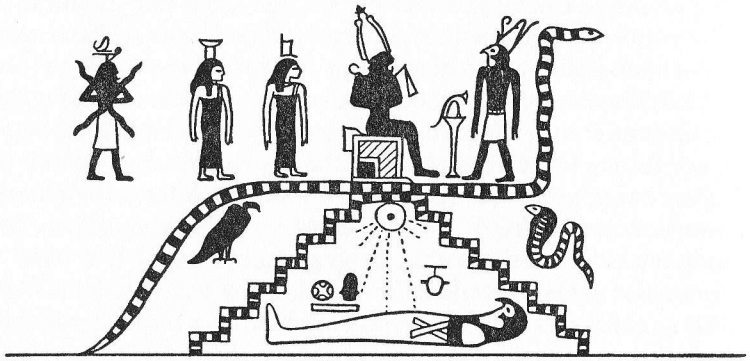


55. Osiris enthroned on the mound with snakes

post-Alexander period, when presumably Graeco-Egyptian ideas penetrated Syria and the Harran region, bringing the names Hermes and Agathodaimon. Arab sources show that Harran was connected closely with India (Sind), the Syrian towns of Damaskos, Tyre, and Hieropolis, Heliopolis in Egypt, and Balkh (where the fire-temple of the Barmacides seems preceded by a temple of the Babylonian Moongod Sin, and yet earlier by one of the Sumerian Nannar of Ur). As a metallurgical centre it was linked with the mines of Asia Minor, Kurdistan, Persia. Successive Mesopotamian dynasties seem to have used it as an important market for gold, silver, copper, tin, as well as mineral substances like sulphur, arsenic sulphides, borax; with the later part of the 2nd millennium B.C. iron and lead must have been added to the list. A mention of Kharsini in connection with the temple of Hermes suggests some amount of trade with China, but how far back that went we have no idea. In any event Harran was well-situated as a place concentrating metallurgical lores, techniques, and myths from a wide area, and playing a key-part in their development. What we know of its cult-systems emphasises this point.[44]

The temple of Kronos had an image of the god in Lead; the associated colour was Black, the geometrical structure of the temple was hexagonal, and the number of steps to the image's throne was Nine. The corresponding systems for the other six deities was as follows: Zeus, Tin, Green, Triangular, Eight; Ares, Iron, Red, Oblong, Seven; the Sun, Gold (hung with Pearls), Square, Six; Aphrodite, Copper, Blue, Triangle (with one side longer



than the other two), Five; Hermes, an Alloy of all the metals (with Mercury in the hollow interior), Brown, Hexagonal (with square interior), Four (circular); the Moon, Silver, White, Pentagonal, Three. At the Wednesday service in the temple of Hermes a Brown Youth, who was a good scribe, was killed and quartered; the quarters were separately burned and the ashes thrown in the image's face. Hermes, with his inner spirit composed of Mercury, was thus the principal god in many ways—though in early times the city-deity was the Moon, Sin. But we must remember that all the evidence is late and does not prove such elaborations at an early date. For instance the account of the number of steps is dated about A.D. 1300. What to make of the sacrifice of the Brown Youth is not clear, except that the story must link with alchemic notions of death-rebirth centred on mercury.

All the evidence we have of Harran alchemy is also Arab. There is a translation, *Treatise of Warning*, ascribed to the Sabian prophet Agathodaimon; and Al-Dimashqui stated in the 13th century that the Sabians considered he had derived his lore from Enoch, who was also Idris or Hermes Trismegistos. The following is a summary of the doctrine:

The Heavenly Art depends on One Thing. To gain the required knowledge from the sayings of Hermes in his books, the student should stick to the single illuminating sentence: This Stone by which the Work is performed is a Stone and not a Stone. It is not an ordinary stone, for it melts and comes out of the essential nature of the stones: a Clear Water and a Pure Spirit. After being mixed with whatever is necessary, and heated, it coagulates into the Etesian Stone, through which alone tincturing is possible. Copper, correctly treated, becomes Silver, and, after more treatments (addition of liquids, trituration, repeated coction), Gold. Instructions are given about mixing the Stone with the Mercury (Spirit) of the Burnt Body of Ashes according to the prescribed weights of the art and exposing the moistened mixture to the Sun. Care was needed to keep the Mercury in moist union with the Body till the latter became soft, fusible, divided into its Elements; for, if the moisture lessens, the Tincture will be imperfect. As fire was the worst enemy of the operation's success, much attention had to be paid to the degree of heat reached, to prevent the Moisture diminishing to such a degree that the Body would not afterwards accept the Spirit.

The disciples then ask from what is the Stone got, what are its

properties and how the art is to be carried out by experiment. Agathodaimon tells them that the art was given by God to Shith ibn Adam, who was ordered to keep his knowledge secret. The Stone, the Light of the Earth, serves as a guide to all created things and makes hidden things manifest; it is most resistant to fire, which only makes it purer and more excellent. "Earth does not cause it to decay or undergo corruption, on account of what the creator has combined in it." In the operation various colours appear: Red, Yellow, White, Black and Green. Its taste is sweet like blood; its smell pleasant; it originates from the earth, where there is temperate heat, proper combination, and the dust is loose and moist. It is the densest of all things. The first operation is very difficult and can be carried out only after many days of coction, trituration and repeated heating following the addition of moisture. Much patience is needed in the first state of Washing, Whitening and Rusting. The order of colour-changes is from Whiteness to Redness: any Blackness at first present in the inorganic matter being eliminated and the matter capable of being endowed with spirit (of being transmuted) thus whitened. Admixture is firstly between the Water and the Earth, and the Body and the Spirit; and secondly, between Water and Water. Combination is then effected by means of Fire, so as to unite Natures into a Single Thing. When the Body has been reduced to fine particles like ashes, "Blackness will most rapidly change into Whiteness by which the Noble Gift and most auspicious Boon will be attained." Next comes information about the Receptacle to be

56. Silver from Samara with encircling griffin (Hermitage)



used, the heat of the fire (like that of the brooding hen), and the all-important separation of the Spirit by solution "so that the grossness of nature will remain . . . and its essential-nature will have disappeared".

The agent for bringing about this required subtility in the material, which makes Tincturing possible, is the Fiery Poison extracted from the Natures by means of Fire. We are told how to treat Copper with this Poison till the Single Gum (or product) white as snow is obtained—called by the sages the White. This is put in a retort, and heated, first on hot ashes from burnt horse-dung, till the Blackness that again appears ceases to appear, and then on a fire of horse-dung. The product is transferred to another instrument, where similar process of heating, distillation, and drenching are carried out, till no Blackness at all survives in the Nature of the substance. Then the Royal Colour appears, the Purple, "from which comes the Complete Tincture which eternity and the lapse of time cannot efface. Neither Water nor Fire causes it to perish, nor will it decay or change as long as the world abides." One *mithqal* (24 carats) of it suffice to transmute an unlimited quantity of whatever is to be dealt with.

The treatise ends with further warnings against the Enmity of Fire, the need for subjecting substances to "decay" by many days' exposure to the heat of moist horse-dung, which reduces the compound to fine soft particles. Also the need to remove the Spirit by solution. Patience is again advised for the work and for penetrating the enigmatic language of the instruction. Disciples must be of good understanding, loving wisdom, studying the books of the sages and, as well, ready to devote themselves to prolonged meditation.[45]

There are many links between these formulations and other works we have examined. Thus the opening aphorism about the Stone is accompanied by the statement that the One Thing is found "among both rich and poor, and from it no spot in the market is free." (The aphorism itself is found in the Arab version of one of Zosimos' treatises to Eusebios.) Maria, as cited by Ibn Umail, spoke of coction of Soul and Spirit into a single thing like Marble; the Arab version of the Zosimos treatise refers to the Etesian Stone as like marble in its extreme whiteness; Agathodaimon compares it to Snow—apparently a local touch, since Harran had snow-capped mountains on both north and west. Zosimos in *The Keys of the Art* explained that the Stone was

called Etesian, Annual, since it was reborn every year: showing that the rebirth-imagery of alchemy was linked with the earth-revival as well as the death-rebirth of initiation-ritual. We saw Agathodaimon in a Greek MS referring to the purification of the minerals as producing something "like acacia-gum or drops". We found both Hermes and Kleopatra insistent on gentle heat; like Agathodaimon they looked to the Sun rather than to violent Flame. Exposure to sun and dew appears in the recipes of Demokritos and of the Stockholm papyrus. The Single Gum of Agathodaimon seems *argyrokolla*, comparable with the *chrysokolla* of Hermes. Though a visible product resulted from the operation, *kolla* (gum) may be taken as expressing the operative power inside matter, through which the constituent opposites, Body and Spirit, are linked in the White or Red Elixir. (Atomic valency has been suggested as a parallel in modern chemistry.)[46]

The list of five colours given by Agathodaimon are the primary ones of the Chinese, who take Yellow as the colour of the Centre.[47] However, when he comes to describing the operations of change, he uses the Greek system. According to Hermes in *The Little Key*, the ancients meant by Purple and Purple Stone the Rust of Copper. Another name seems to have been *komaris*. Not that these names imply that verdigris was the elixir; they apply to any preparations of any substance thought to be of use in bringing the elixir about. By the action of Fire the Spirit (Mercury) of the materials in use was set free, until at last, after various other operations (especially solution and further heating), the Spirit was reunited with separately purified Matter into an elixir, which to some extent owned the creative and transforming energy of the All or the One.[48]

Two commentaries, those of Jamasp and Asfidus, seem to belong to the Harrar tradition. Jamasp's treatise is ostensibly dedicated to Ardashir, the first Sassanian king (A.D.226–41). Such evidence is not, however, trustworthy, as authors or later scribes were liable to insert a dedication that seemed to prove the antiquity of a work. Still, the commentaries are of interest in helping to establish the fact of a definite Harrar school of alchemy, which looked on Hermes and Agathodaimon as its founders. Axioms of Hermes on which the school based itself were: Whatever you sow, you will reap; make the bodies bodiless and the bodiless bodies; cultivate gold in the white silvery soil and drench it with the water of life. The first two of the axioms we know well from



our Greek manuscripts. The two commentators cite Demokritos as saying: "My Master Ostanes used to submit the Nature to coction from outside, then to triturate it, and [finally] to make the Poison penetrate into its inside."[49]

What is distinctive about the Harran school is its stress on the sole use of minerals and metals in the operations, together with a dualistic theory, which suggests a strong Iranian basis. The minerals, created by the One out of the One, were made up of two opposites, Matter and Spirit. Further the metal used in the preparation of Gold and Silver is Copper.[50] Though Lead appears in the Planetary Table of the Metals, it is absent from the alchemic writings. On the other hand, Lead is basic in the alchemy of the Greek operators. In order to support the unique nature of the Harran school it has been asserted that only there does copper play a serious part, and that where Zosimos mentions it, he is using the term as a synonym for the Stone (because the red hues of copper show up at some stage in the processes) or as part of the name *molybdo-chalkos*, lead-copper. Such a statement, however, indeed goes too far. It is true that it is usually hard to tell if an alchemist is using any term in its literal or its symbolic sense; but if we were to apply our doubts about literal meanings in a rigid way, we could ask what it was the Harran alchemists really meant by Copper. This, however, is carrying scepticism too far. We often meet copper in Greek formulations: Stephanos thus writes:

> So there is no need to be afraid of burning and reducing to ashes all these bodies. For they come again to a certain power and virtue and rebirth, since they own a nature imitative of the whole universe and of the elements themselves, whence also the rebirth, a communion with a certain spirit, as of things coming into existence by a material spirit. So copper, like a man, has both soul and spirit.
>
> For these melted and metallic bodies, when reduced to ashes, are joined to the fire and again made spirits; for the fire gives freely its spirit to them. As they manifestly take it from the air that makes all things, just as it also makes men and all things, thence is given to them a vital spirit and a soul. So also the fusible bodies, reduced to ashes with the metallic bodies, recover their soul by a certain method, as if becoming akin to the fire. And likewise all the elements have creations, destructions, changes, and restorations from one to another.
>
> So also copper, after it has been many times burnt and restored with oil of roses and expelled, becomes without stain, better than gold. But it is necessary to allow of this being threefold, for the untinged, the being-tinged, and the tinged.

The last sentence there presents the triadic formula in new terms. Again Stephanos says:

> This copper, suffering all things and being further roasted, becomes the Etesian Stone in colour, Etesian as something binding. After being roasted, it is quenched in the divine moisture, which they call the divine water, the dissolved oil, and it becomes the thickness of wine, and there remains for 41 days in the gentle heat of a vapour-tight vessel, the matter being destroyed completes at length the apparent mystery, holy and sought-for of the water of sulphur. And it is the Stone that does these things.

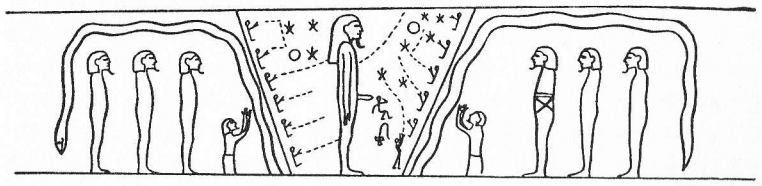
The Etesian or Annual Stone we have already noted; as a substance, apart from a symbol, it seems something pyritic; cuprous oxide, *aes ustum*, may be meant here for the copper—that oxide being of colour like the reddish-purple of the iron oxide got from burnt pyrites. Al-Razi in his *Shawahid* cites Hermes as saying that "The Great Tincture is formed from our burnt copper and our strong water. From other than these nothing can go forward. Fuse them together until all the copper is melted and mixes with the water to form the Great Stone."[51]

However at Harran we do seem to meet a local school firmly based on copper and its preparations; and it may be conjectured that the lore of Harran goes back to a period when copper was the chief metal in use, *i.e.*, roughly 4500 to 1200 B.C. or a little later, when the Iron Age comes definitely in. (Iron rust is mentioned in the commentaries, though not in the treatise of Agathodaimon itself. "The substances will be formed in the First Operation, just as Iron Rust is formed." The reference to iron there, it will be noted, has no primary importance and could be intrusive.)

This concentration on copper, to the exclusion of iron and lead, is certainly striking and does no doubt point to an ancient tradition; but to carry alchemic theory, on this evidence alone, back to the 2nd millennium B.C. is going too far. No doubt proto-alchemy proper could not have developed without the convergence of a number of factors, of which Greek philosophy was one. At most we can suggest that in Harrar some very old metallurgical ideas and images, carried on by local craft-fraternities, coalesced during the Hellenistic and Roman periods with methods and formulations from Egypt and Syria to produce the specific school of Agathodaimon. It still remains odd that the Greek-Egyptian names of Agathodaimon and Hermes were used to



denote the founders of Harrar alchemy. Attempts have been made to find the name Hermes or something like it as that of an ancient earth-god among the Kilikians and Hittites—*Arma* among the latter, with the Greek *Hermax* related.[52] The origin of the Greek god Hermes is indeed obscure, but one line of inquiry has been to link him with *herma*, *hermax*, rock, stone, ballast—with the heaps or cairns of stone piled by roadsides or at holy places. At least we can certainly say that he was often worshipped under the form of a stone and that the *herms* or *hermai* which bear



57. Serpent-enclosed ithyphallic Osiris

his name were not statues at all, but square pillars, tailing in a little at the lower end, crowned with a human head, and owning a penis stuck half-way up the front. There is nothing unlikely then in his having a primitive stone-god as at least one important aspect of his origins, or in this god having a wide early provenance in Asia Minor. But it is a long jump from the *Ur*-Hermes to the learned alchemist of Harran. Hermes may indeed have had early metallurgical connections; for he was credited with inventing fire and was identified with Kasmilos (Kadmilos), one of the Kabeiroi. However, in the case of Harran there is no evidence at all for the persistance of a cult of Hermes-Arma, connected with copper-smelting craftsmen, who was merged with Hermes Trismegistos during the period when Syria and Mesopotamia were included in the Greek Seleukid empire (312 to 65 B.C.). At most we can say that during that period, or early in the Roman Empire, the prestige of Hermes and Agathodaimon were sufficiently high in the sphere of the occult sciences to be taken over at Harran to lend importance to the local lores, and that in the process many ideas from the Egypt of Demokritos-Bolos and Hermes Trismegistos were drawn on—but not strongly enough to drive out the copper-basis of the local lores and practices. What is most impressive in the Harran alchemy of Agathodaimon is its

insistence on keeping to metals alone for its operations. That fact does strongly suggest a close link of the ideas with metallurgical craft-fraternities who, in their mystery-revelations, had many conservative and ancient elements.

# 15

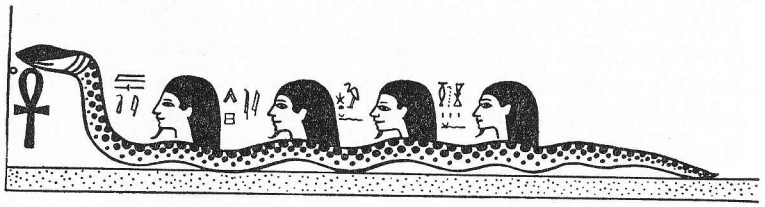
# Zosimos

We now come at last to a fairly historical figure, with no mergings into deities or mythical characters: Zosimos of Panopolis. He is cited by the Synkellos and by Photios; and all the later alchemists speak of him with respect. He is the Crown of the Philosophers, his language has the Depth of the Abyss. The *Souda* says that he and his sister composed twenty-eight Books, an Alchemic Encyclopedia, with the title *Cheirokmeta* like that of Bolos. Portions survive in Greek, or in Syriac versions.[1] It has been said that the number twenty-eight was used for his books because he named each one after one of the twenty-four Greek letters, plus the four more of the Kopt alphabet. But he may have been thinking of groups of four books, each under one of the seven planets; or of the lunar month. He was a pagan, but his text suffers from Christian interpolations, and the alchemist called The Christian cites him. He was well read in general Hermetic literature, and knew of the *krater*-baptism, the fall and the ascent to the First Man, *Anthropos*, the heavenly mirror where the soul sees its true nature, and so on. But he was still a genuine practising alchemist, whatever his views on the wider aspects of theory. He was certainly not the same man as Zosimos the historian.

He cites Demokritos and Afrikanos. The latter was almost certainly the Sextus Julius Africanus, at whom we have already glanced. He seems a Syrian and lived mainly at Emmaos. The Synkellos says that he wrote on medical science, agriculture, chemical matters, geography, warfare and the history of Armenia (drawing on the tabularia of Edessa). His *Chronikon* in five books dealt with events from the Creation to A.D. 221; parts of it were extracted by Eusebios in his *Chronicle*, and some fragments survive. He wrote to Origen impugning the authority of the *Book of Susanna*; his letter and Origen's reply are extant. Also he wrote to Aristeides on Christ's genealogies in Matthew and Luke.

Another work of his was *Kestoi* (Girdles) named after Aphrodite's Girdle, in twenty-four Books (says the *Souda*), fourteen (says Photios), nine (says the Synkellos): a sort of commonplace book on a wide variety of subjects. The *Gepokika* includes recipes of his on the preservation of wine. When Emmaos was burned down, his fellow-townsmen sent him to solicit Elegabal for its restoration; he succeeded and a new town, Nikopolis, was built in 221. The historian Sokrates classes him with Clement and Origen as one of the most learned Christian writers. However, the *Souda* tells us that his remedies consisted of written characters, incantations and magic words. He is quite likely to have been an alchemist. He is cited among alchemic authorities and in an initial list.[2]

Zosimos was interested in apparatus, like Maria, whose work he knew. He wrote a treatise *On Instruments and Furnaces*, and he referred to the pneumatic and mechanical work of Archimedes and Heron.[3] He deals with the *tribikos* or three-pointed alembic and its tube; the description is illustrated with figures showing an alembic, head, tubes, recipient, phials on a furnace, with the axiom: "Above, the heavenly things; below, the earthly. By the male and the female the work is accomplished." Thus he carries on in the idiom of Kleopatra. His counsel is the traditional one of silence. "Reveal nothing of all that to anyone else and keep these things to yourself. Silence teaches virtue. It is very fine to understand the transmutation of the Four Metals, lead, copper, tin and silver, and to know how they change into perfect Gold." In *On Lime* he ends, "This is the secret one has sworn never to reveal." As a result he uses the circuitous and allusive language of the art. "This stone which isn't a stone, this precious thing which has no value, this polymorphous thing which has no form, this unknown thing which is known of all." And "here is the Mithraic Mystery, the incommunicable Mystery".[4]



58. Serpent containing the four cardinal points



It is often said that though of Panopolis he must have worked in Alexandreia; but there is no reason why he should not have mainly lived in his home town, which was a lively centre of culture, with its own mixture of Greek and Egyptian elements and with a strong pagan nationalism. The letter that he wrote to his sister, cited in Chapter II, shows that he shared the Panopolitan outlook.[5] His date seems around A.D. 300. In his *Commentary on the Letter Omega* he often cites Hermes, especially his *On Natures* and *On Immateriality*. The *Commentary* may represent one of the twenty-eight books of his encyclopedia; if that work, arranged on a planetary basis, began with the Moon, the Omega Book would belong to the section on Kronos.[6] The text is not in a good state, but it is worthwhile to attempt a rendering:

> The letter Omega, the round one, the twy-formed, the unconquered, belonging to the Seventh Zone of Kronos according to the bodily sense—for according to the incorporeal sense, it is quite another thing, inexplicable, as alone Nikotheos the Hidden [a Gnostic to whom an apocalypse was attributed] has known—according then to the bodily sense, that which is called the Ocean, "origin and seed of all the gods", says the poet [Homer] . . . this grand and admirable letter Omega contains the treatise on the apparatus of the divine water [sulphur] and on all the furnaces, mechanical and simple, and generally on all things.
>
> Zosimos to Theosebeia, may all go well with you.
>
> Timely tinctures, woman, have turned the book on furnaces into ridicule. Many men indeed, on account of having enjoyed the favour of their own *daimon* so that they succeeded with timely tinctures, have mocked at the book on furnaces and apparatus, as not being true. And no argument could convince them that that book was the truth. Only when their own *daimon* left them at the time marked for them by Fate and they were controlled by another *daimon*, a disastrous one, have they been persuaded. Then, after all their art and happiness has been brought to a stop and the same formulas of chance have been turned into contrary effects, they have been forced in their own despite to face the evidence of their Fate's arguments; and so they have admitted that there was some truth in those procedures that previously they scorned.
>
> But such men could find no admission into the presence of God or of the philosophers [alchemists]. Let the times indeed change afresh in form and grow better from one moment to the next, let the *daimon* grant them a material benefit, once again they'll change their opinion and agree to the opposite of what they were saying. They forget all the earlier factual evidence, and, always at the pull of Fate, whether towards the aforesaid opinion or towards its contrary, they can conceive nothing but material things, nothing but Fatality.

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These are the men whom, in his book *On Natures*, Hermes called: "Men without intellect, simple puppets in Fate's procession, without any idea of incorporeal things, not even of the Fate itself that rightly drags them along—though they never pause in protesting against her corporeal corrections, unable to imagine nothing beyond the benefits she gives."[7]

This is all part of the argument against submitting to Fate, to the deterministic view of life. Such a view, it is argued, is inevitable in men who cannot rise to a true consciousness of the nature of things; for they are indeed at the mercy of forces they cannot know and so cannot control. For a while perhaps "timely tinctures"—that is, work operating on a schematic system of the correct "times" for its experiments—may produce good results. The men are then impermeable to argument. But when things start going wrong, as they certainly will—since abstract schemes cannot bring the same consistent results as true knowledge—then these men are ready to accept the arguments they denied, but their acceptance is made without understanding and is useless. Zosimos makes clear that he is speaking, not only of craftsmen in general, but of certain practitioners of his own art, whom he considers to be on the wrong track. Though he does not here specify their methods, we may assume that they lacked in his opinion a grasp of the necessary theory; that they were trying to apply recipes and formulas without understanding the triadic principles of transformation and the unitary nature of matter. He goes on:

Hermes and Zoroaster have declared the breed of philosophers to be above Fate, as they do not rejoice in the good fortune she gives. Rather, they are masters of pleasures and are not stricken by the evils she sends if they truly look beyond all their ills. And they do not accept the fine gifts that come from her, since they pass their life in immateriality.[8]

Here he widens his argument to take in not only alchemists but all sages who claimed to be above earthly things and the rule of planetary powers. For the moment he is not discussing how correct they are in considering that they live in an "immaterial" sphere.

The whole bias of his argument is against astrologic determinism, with which he links the question of timely or apportune moment, as fixed by the stars. The astrologers claimed to be able to find out such moments and thus to settle what was the correct



time for starting on all enterprises, *katarchai*. They held that each section of time, large or small, was dominated by a particular influence, by a *chronokrator* star, one that controlled time. Calculations of opportune moments were made especially with the Moon as *chronokrator*; her revolution was cut into sections of $2\frac{1}{2}$ days: the time she took to cross a Zodiacal zone. But the principle could be applied to the Sun or any planet. The system was particularly strong in Egypt where each of the 36 dekans in turn was the ruler of one of the 36 dekads; and opportune moments were worked out hour by hour. (In the account of Alexander's birth by the pseudo-Kallisthenes, the magician Nectanebo twice held up the babe's emergence so as to make it occur at the moment favourable for world-empire.) As metals and minerals were thought to grow and be born, the methods used for finding the timely moment of *katarchai* could be applied to metallurgical process. Clearly many alchemists had given pre-eminence to these astrologic principles, which Zosimos sees as diverting them from the real problems of formative process and change. Incidentally we notice that the descent of Amnael to Isis was determined by the astrologically timely moment (in one of the versions); Zosimos would have objected to this detail as an interpolation by the deterministic school.

That is also why Hesiod shows us Prometheus warning Epimetheus:

"What is in the eyes of men the greatest good-fortune?
"A lovely woman and a lot of money."
To which Prometheus answers:
"Beware the acceptance of gifts from Olympian Zeus.
Put them afar from you."

Thus he counsels his brother to reject through philosophy the gifts of Zeus, that is of Fate.

Zoroaster declares presumptuously that by knowledge of all the things from on high and the magical virtue of corporeal sounds, a man is able to ward off all the evils of Fate, both the particular and the universal ones. Hermes, on the contrary, in his book *On Immateriality* takes hold also of magic; for he says that the spiritual man, he who understands himself, must not redress anything whatever by magic, even if he rates it as good, nor must he do violence to Necessity. He should let it act according to its nature and its choice, and he should advance solely by the quest of himself—holding firmly, in the knowledge of God, to the ineffable Triad, and leaving Fate to deal in its own way with the mire that belongs to it—that is, the body.

And thus, he says, by this way of thinking and living, you'll see the

Son of God becoming all things in favour of the pious souls in order to draw the soul from the region of Fate and raise it to incorporeality. See him becoming all—god, angel, vulnerable man. For, since he can do all, he becomes all he wishes [and he obeys his Father]. Penetrating the body, illuminating the intellect of each man, he gives him the impulse to climb towards the happy region where this intellect is found before becoming corporeal, it makes him follow in its track, puts him in a state of desire, and serves him as guide up to that supernatural light.

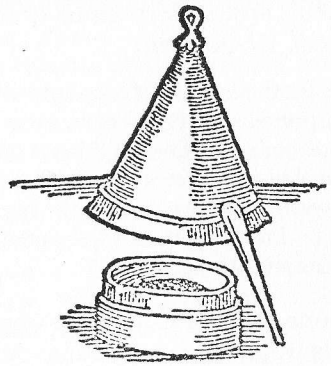
Zosimos' text of Hesiod was somewhat interpolated; and his interpretation sophisticates the simple meaning in the manner of the later allegorisers. But what he says about Zoroaster is important. He rejects the idea that some kind of direct *gnosis*, aided by magical forms of compulsion, is the way of mastering Fate. The position he sets out for Hermes seems at first glance to be close to that of the Stoics with their emphasis on inner balance or justice; but for an alchemist the quest for self-knowledge was necessarily linked with the quest for the clues of inner change in metals. What Hermes and Zosimos are rejecting is the idea that one can defeat Fate (all the deterministic mechanisms, which are identified with the servile elements in society and with bodily necessities) by sacramental-magic means or by a sheer effort of will or some short-cut to illumination. These means are considered as much a dereliction as the mechanistic approach which the earlier section of the treatise criticised. The true way is that of the *Furnaces and Apparatus*: presumably the way shown by Maria and Kleopatra, in which at every stage experimental action is joined with spiritual illumination.

The latter part of Zosimos' text given above seems to have been in part changed or interpolated by a Christian scribe or commentator. The phrase "and he obeys his Father" is an obvious intrusion, which attempts to convert the Gnostic saviour into Christ. What Zosimos has in mind would be easier to state if we knew more of the gnostic Nikotheos whom he cites at the outset. We know this thinker only from various references. He was disliked by the Neoplatonists; his *Apocalypse* was attacked by the disciples of Porphyrios. But the Manicheans counted him among the number of their prophets. In the Gnostic treatise known as the Bruce Codex we are told of the Monogene, the Only-begotten, that "to speak of him as he is, with the tongue of flesh, is impossible". However some specially favoured men have been able to read the mystery:



That is why the powers of the great Aions paid homage to the power that was in Marsanes, saying, "Who is this man, who has seen such things face to face?" . . . And Nikotheos spoke about this, for he saw who this being was, and he said, "The Father exists, superior to every perfect thing." He has revealed the Triple Power, perfect and invisible.[9]

The Neoplatonists classed him among the Mages. Porphyrios remarks of two men whom he considered backsliders: "They had departed from the ancient philosophy and possessed a great number of works by Alexandros of Libya, of Philkomē, of Demostratos of Lydia . . . They also made show of *Revelations* of Zoroster, of Zostrian, of Nikotheos, Mesos, and others like them. They deceived many people . . . Plotinos often refuted them." What was there about Nikotheos then that made Zosimos admire his account of being rapt to heaven? With the paucity of our materials it is hard to say; but perhaps it was an emphasis on the unity of being and at the same time on the triadic nature of its manifestations. It seems we may attribute to Nikotheos the doctrine that the Son of God, the Monogenes, could become anything—that is, undergo any transformation. If so, that would explain why Zosimos thought he held the great clue which was denied alike to mechanist-minded seekers and to those relying on magical forces for short cuts, to those who thought a philosophic asceticism enough in itself and to those confident in gaining special favours from aloft by use of appropriate formulas. The alchemic way cut across all these methods and held that one could truly save one's soul only by concretely and scientifically entering into the transformations of nature, which were also those of the Monogenes, who expressed the unitary character of process.[10]



59. The cold still of Zosimos

Zosimos goes on about this Monogenes, the Primal Man, also called Adam:

> Consider as well the picture that Bitos drew and [what has been written by] the thrice-great Plato and the infinitely great Hermes: you will see that Thouth is interpreted in hieratic language as the First Man, the interpreter of all others, he who gives a name to all corporeal things.

Bitos is again an obscure figure, but he seems clearly the same person as the prophet mentioned by Iamblichos as interpreting Hermetic thought; for here again we meet a context of Fate and its overcoming. The Egyptians, Iamblichos says, do not attempt to solve cosmic matters by reason alone,

> but invite men to ascend, by the aid of hieratic theurgy, towards more lofty and more perfect beings, superior to Fate, towards God and the demiurge, and do not work on the matter or carry anything out except at the exigency of a timely movement.
>
> Hermes has taught this way; and the prophet Bitys has made King Ammon acquainted with it, having found it written in the sanctuaries, in the hieroglyphic inscriptions of Sais in Egypt. He made known that the name of God means whatever is spread out in the whole world. But there is in his thought many other ways of dealing with the same subjects, so that you don't seem to be right when you bring everything down among the Egyptians to physical causes.[11]

The pantheistic note that Iamblichos attributes to Bitys may well explain why Zosimos thought highly of him. Just as Nikotheos (if I am right) saw the divine force undergoing transformations into anything and everything, so Bitys saw that force at work everywhere and anywhere. Zosimos, by the way, in the last passage of his cited, makes a common pun on Hermes and *hermeneus* (interpreter). He goes on:

> The Chaldaians, the Parthians, the Medes, and the Hebrews call him Adam: which is interpreted as Virgin Earth, earth the colour of blood, earth red-fire, earth of flesh. We find all this set out in the Libraries of the Ptolemies, and deposits of these writings were made in each temple, especially in the Sarapieion, when Anesas the highpriest of Jerusalem was invited to send an interpreter who translated the Hebrew text [of the Bible] into Greek and into Egyptian.

Iranian speculations on the Primal Man went far back. Hippolytos tells us that the Chaldaians called him Adam, the Assyrians Adonis or Endymion, the Phrygians Attis, the Egyptians Osiris,



and the Greeks Hermes—while the *Hymn to Attis* resumed these names, adding that the Samothracians called the Primal Man Adamna, the Haimonioi Korybas, and the Phrygians also used the name Papa.[12] As for Adam as the Earth, Olympiodoros adds, "He became the first man of all out of the Four Elements; he is called also the Virgin Earth and the Fiery Earth and the Earth of Flesh and the Earth looking like Blood: you will find these things in the Ptolemaic Libraries." We have here a set of puns worked out by Alexandrian Jews: Hebrew *adamah* = Earth, and Greek *admēs* = Virgin. Hesychios has "Adama: Virgin Earth", and Josephos says of Adam: "which signifies one that is flame-coloured as he was made out of fiery [red] earth; for such is virgin earth."[13] Zosimos seems drawing on Jewish-Egyptian sources for his remark on the Bible, which replaces the name usually given, Eleazar, with Anesas, and adds a (non-existent) version into Egyptian.

> So, the First Man, who is Thouth among us, these peoples have named Adam, with a name borrowed from the tongue of the angels. And not only that, but they have named him symbolically, using Four *Stoicheia* [Letters, Elements] drawn from the totality of the sphere, according to the body. The A of this name of this name expresses the rising sun, air; the D expresses the setting sun, the earth which inclines downwards on account of its weight; [the second A expresses the north, water]; M expresses the maturing fire which is intermediary between these bodies and which refers to the intermediary zone, the fourth.
>
> Thus it is that the sensual Adam is named Thouth according to the external patterning. As for the man who is inside Adam, the spiritual man, he has simultaneously a personal and a universal name. His personal name I have not learned so far; only indeed Nikotheos the unmatchable has known it. His universal name is *Phos* [Light]: hence the way of calling men *Photes*.
>
> When *Phos* was in Paradise breathing in the freshness [the Archontes], instigated by Fate persuaded him, as something harmless and without after-effect, to put on the body of Adam which came from their hands, which had issued from Fate, which was formed of the Four Elements. He, being without guile, did not refuse and they glorified in the thought that henceforth they held him in slavery.
>
> Indeed the external man is a bond, as Hesiod says, the bond by which Zeus bound Prometheus. Then, after that bond, Zeus sent him as another bond Pandora, whom the Hebrews call Eve. In allegorical terms, Prometheus and Epimetheus compose together a single man: that is, soul and body. At one moment Prometheus [Man] resembles the soul, at another he resembles the intellect, at another the flesh,

because of the refusal of Epimetheus when he refused to listen to his own [intellect].

In effect the Nous, our god, declares: "The Son of God, who can do all things and become all things as he wishes, shows himself as he wishes to each man."

And up to this day, and on till the end of the world, in secret and in hidden ways, he comes to those who are his and communicates with them, counselling them, in secret and by means of their intellect, to separate themselves from their Adam, who blinds them and who grudges the spiritual and luminous man.

Thus it goes on until there comes the falsely-imitating *daimon*, who grudges them and who wants, as before, to send them astray by calling himself the Son of God, though he is hideous of soul and body. But they become wiser since they received into themselves him who is truly Son of God, they deliver over to him their own Adam so that he may kill him, while they save their luminous spirits for their own homeland—there where they were before coming into the world.

But at first, before reaching these audacities, the false imitator, the jealous one, sends from Persia his precursor who launches out in lying discourses and who drags men along in the procession of Fate. His name has nine letters, counting the dipthong as two: which corresponds to the number in Fate. [The name is *Manichaios*: Fate is *Heimarmene*.] Then, after about Seven Periods, he himself will come in his own nature.

We find all that only among the Jews and in the sacred books of Hermes, concerning the luminous man and his guide the Son of God, the terrestrial Adam and his guide the false-imitator, who calls himself, by a blasphemous lie, the Son of God. The Greeks call the terrestrial Adam Epimetheus, who receives from his intellect [that is, his brother] the advice not to accept the gifts of Zeus. However after having fallen, repented, and sought the blessed land . . . [As for Prometheus, the intellect] he explains all and advises in all matters those with spiritual ears. But those with only corporeal ears belong to Fate, for they accept and admit nothing else.

Those who succeed in timely tinctures assert that there is nothing outside their art, and mock at the great book on Furnaces, they do not even heed these words of the Poet (Homer): "So far the gods have never given to men all good things all together," and what follows, and they pay no attention, they do not guard against the ordinary course of human affairs in the sense that, with regard to a given art, success is various, various the practise, from the fact that the diversity of human manners and astral figures make the art in question also diverse, that one artisan takes the lead, another remains a simple craftsman, while another remains backward and yet another, still worse, makes no progress at all.

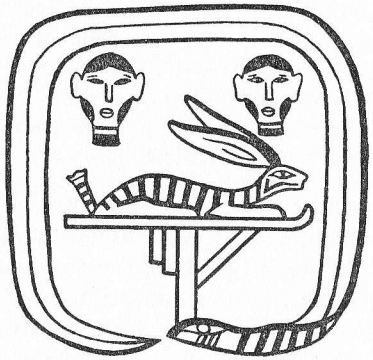


We see then that in all industries men practise the same art with tools and methods that differ and show themselves to possess varying degrees of intelligence and success. But more than in any other it is in the Sacred Art above all that one can make this statement. Take for instance the case of a bone-fracture. One finds a bone-setting priest and he, strong in piety towards the gods, re-sets the bones so well that one hears a grating noise as the bones fit into one another. If one cannot find a priest, in order to stop the afflicted man from fearing that he'll die, one goes in search of physicians who own books filled with line drawings shaded in the manner of painters and with all sorts of designs. Then, according to what the book says, one binds the patient all around with a dressing, and he lives a long time with his health recovered. So there is no question of leaving the man to die, just because one didn't find a bone-setting priest. But the persons of whom I speak, on meeting a failure, leave themselves to die of hunger because they didn't take the trouble to understand and to realise the "bone-setting" model of the Furnaces, which would have made them, happy mortals, triumph over poverty, that incurable evil.

I have omitted some brief Christian interpolations, which disturb the flow of the argument.[14] The imitative spirit, *Antimimos*, recalls the Counterfeiting Spirit of the Gnostics (considered in Chapter II); also the Antitheos of the Mazdeans and the cheat of *II Thessalonians* (2,4). The precursor from Persia seems certainly Manichaios (Mani), who died under Bahram I (A.D. 274–77). As for the Seven Periods, Zosimos has drawn these from the works of the Magousaioi who taught that the life of the world was divided into seven ages or millennia, each under a planet of its own and bearing the name of the metal associated with the planet. We noted this creed at the outset of our inquiry (in Chapter II). Such Magian views developed into the Jewish-Christian chiliastic creeds. Lactantius among the Christians in particular set out the schemes, drawing on a Mazdean source. The world was to last six thousand years; then the reign of Christ would be established on earth for a millennium of felicity; in the eighth millenium the universe would be destroyed and recreated in a form that would last forever. Lactantius noted with gratification that in this matter pagan wisdom agreed with Christian revelation, and he specially praised Hystaspes, whom he considered a "very ancient king of the Medes", an inspired man. He therefore had no scruples in incorporating passages from *The Apokalypse of Hystaspes* into his *Institutions*.

We may note that the person who is to come after the seven

periods in Zosimos' formulation is probably, not the Antimimos (as the grammar would make us suppose), but the true redeemer, the Monogenes. In the final passage the hit-or-miss skill of the priest is compared with the fully-grounded knowledge of the physician with his books involving both theory and practice. As for the main sources of Zosimos' exposition, he himself indicates them: the work of Nikotheos, various works of Hermes, and an allegorical exegesis of *Genesis*. We may add an allegorical work on Hesiod. Philon of Alexandreia shows us how Hellenised Jews explained their Bible in highly fanciful and elaborately symbolic



60. Cosmic serpent enclosing Hermopolis

terms; and though the allegorisers worked mainly on Homer among the ancient poets, Hesiod was not forgotten.[15]

After his long introduction, Zosimos says, "But enough on this point: let's return to our subject, which concerns apparatus." He tells his sister that he feels repugnance, since he cannot hope to do better than the ancients, yet he'll submit to his pupil's wish and compose his treatise on Furnaces. However, all that survives is a passage on the alembic. But we may assume that the following account of *tribikos* and tube is a part of the promised treatise.[16]

In a treatise called *Final Account*—apparently the concluding part of his encyclopedia—Zosimos again sets out his position, but this time he speaks mainly of tinctures. The full title is *The First Book of the Final Account of Zosimos the Theban*: some scribe has perhaps added the name of Thebes as that of a place of



renown.[17] First comes the letter to his sister on metallurgy in old Egypt. He goes on:

> Some persons then reproach Demokritos and the Ancients for not having mentioned these two arts, but only those that are termed noble. This reproach is futile. They could not do it, these men who were the friends of the Kings of Egypt and who gloried in holding the first rank in the class of prophets. How could they have openly, against royal orders, set out in public their knowledge and give others the sovran power of wealth?
>
> Even if they could have done it, they would not; for they were careful of their secrets. It was possible only for Jews, secretly, to operate, write, and publish these things. Indeed we find that Theophilos, son of Theogenes, has described all the country's goldmines and we have Maria's treatise on Furnaces as well as other writings by Jews.

We see his Egyptian pride again obtruding; also his wish to enlarge the prestige of his craft by painting the greatness of his predecessors, the high regard in which they were held. "King's Friend" was an honorific title, often found in the astrologers; and the rank of prophet was the highest one in the priestly hierarchy. Bolos in *Physika and Mystika* speaks of his Fellow-Prophets.[18] The Hermetic idea of the Prophet is given in *Kore Kosmou*:

> They are those who learned from Hermes that the atmosphere is filled with daimons and have engraved it on hidden *stelai*.
>
> They are those who alone, instructed by Hermes of the secret ordinances of God, have made themselves for humanity the initiators and legislators of the arts, sciences, and craft-activities of all sorts.
>
> They are those who, having learned from Hermes that things below have received from the Demiurge the order-of-being in sympathy with those above, have instituted on earth the sacred functions linked vertically with the mysteries of heaven.
>
> They are those, who, having recognised the corruptibility of bodies, have ingeniously created the perfected excellence in all matters of the prophets, so that never is a prophet, destined to lift his hands to the gods, ignorant of any of the beings—and so that philosophy and magic may nourish the soul, and medicine cure the body when afflicted with any ill.[19]

Zosimos continues with his account of tinctures:

> But neither Jews nor Greeks have ever made public timely tinctures. These tinctures, indeed, the Jews deposit in the [treasuries] where they put their riches, giving them to divine images to guard. As for the

treatment of minerals, which differs much from timely tinctures, they do not show themselves at all as jealous—because this art cannot but show itself outwardly and whoever tries to practise it [cannot] remain without punishment. If in effect a man is caught digging a mine by the inspectors of State Manufactures on account of royal revenues . . . or because furnaces cannot be hidden away, while timely tinctures are carried on quite out of view. That's why you don't see that any of the ancients has published secretly or openly, anything whatever on the subject. In the whole series of the ancients, I have found only Demokritos making allusion to it . . .

It is clear that formerly, in the time of Hermes, these tinctures were called natural, as they had to be described in terms of the general title of the book called *Book of Natural Tinctures, dedicated to Isidoros*. But when they became the object of the jealousy of the daimons of the flesh, they became timely tinctures and took over that name. Still, reproaches are made to the ancients, and above all to Hermes, for not having published them, secretly or openly, and for making no allusion to them.

Only Demokritos has set them out in his work and mentioned them. And as for them [the ancient Egyptians], they engraved them on their stelai in the darkness and depths of the temples in symbolic characters —both the tinctures and the chorography of Egypt—so that, even though one carried boldness to the point of penetrating into those dark depths, if one had neglected to learn the key, one could not decipher the characters for all one's boldness and trouble.

The Jews, then, imitating the Egyptians, deposited the timely tinctures in their subterranean chambers together with their formulas of initiation; and they set down this warning in their testaments: "If you find my treasures, leave the gold to those who desire their own ruin; but if you find out how to understand the characters, you will gather all the wealth again in a short while. On the other hand, if you take only the wealth, you will go to your ruin because of the jealousy of kings, and not only of kings, but of all men."[20]

These passages give us another reason why the alchemists were so secretive. The harping on the "jealousy of kings" reminds us of the probable persecution under Diocletian; under either the Ptolemies or the Romans anyone known to be dedicated to goldmaking was sure to attract the unwelcome attention of the authorities and be exposed to ridicule and persecution.

There are then two kinds of timely tinctures. One of them, that of stuffs, the *daimons* who watch over every place have handed over to their own priests. That is why, besides, they are called *timely*, because they operate according to the timely moments through the will of the



supposed daimons; and when the daimons cease from giving their assent [they fail to operate]. . . .

The other kind of timely tinctures, that of genuine and natural tinctures, were set down by Hermes on the *stēlai*: "Melt down the sole thing which may be greenish yellow, red, sun-colour, pale green, yellow of ochre, green verging on black, and the rest." As for the earths themselves, Hermes has called them with a secret name, "sands", and has revealed the kinds of colours. These tinctures act naturally, but they are grudged by the terrestrial *daimons*. However, if anyone, after being initiated, drives the *daimons* away, he will obtain the sought-for result.

How far Zosimos was really worried about *daimons* and how far he is using allegorical language is hard to say. The comment about the timely tinctures being "handed over to the priests" whom the *daimons* serve, suggests some sort of rivalry between the alchemists and the priesthood—though how it could operate is not clear. Timely Tinctures, in their opposition to Natural Ones, certainly mean those operations carried out according to astrologic systems which determined the correct time and place of work. We are reminded of Iamblichos' remark about the Egyptians refusing to "carry anything out except at the exigency of a timely movement". There he is apparently giving this attitude the authority of Hermes and Bitys, two of Zosimos' mentors; but he may be citing those thinkers, not for the particular point he has just made, but for the general Egyptian scheme of the cosmos he has been outlining:

There is among them another hegemony of all the elements diffused in generation and forces residing in it: four female forces and four male forces. This hegemony belongs to the sun. And there is another principle of universal nature existing in generation that is attributed to the moon. Dividing the heaven into two, four, a dozen, thirty-six parts, or double that, or in some other number of some sort of parts, they put at the head of these, hegemonies more or less numerous. But above all is set the One that is their superior. And thus among the Egyptians the procedure is to start from above, from the principles down to the last beings, while giving to them all the one as Origin. Everything ends in a multitude of beings ruled by a One, and indeterminate nature is governed by a determinate measure that is the supreme unity. . . .[21]

Zosimos seems to dislike the astrologic schemes as expressive of determinism and the rule of Fate. Sometimes, he has said, the calculations come off and convince their adherents; then they fail. What he wants is a complete unity of theory and practice; and

this it seems is embodied in what he calls Natural Tinctures. For such operations were achieved by making the laboratory work reflect and repeat the actual processes of nature in their fullness. By "natural" then he means, not "carried out by nature", but "carried out in the same way as nature". He goes on about the *daimons*, who, in their pestering ways, have some analogy with the watchful inspectors who prosecute the infringers of State rights and controls.

Thus then the watchful *daimons*, once repelled by the powerful men of old, resolved to take control of the Natural Tinctures in our stead, so as to be no longer chased off by men, but to receive their prayers, to be invoked by them, and to be regularly nourished by their sacrifices. That is then what they did. They hid all the natural procedures, which acted through themselves, not only because they were jealous of men, but also because they were concerned with their own subsistence, so as not to be whipped, chased out, and killed with hunger through receiving no more sacrifices.

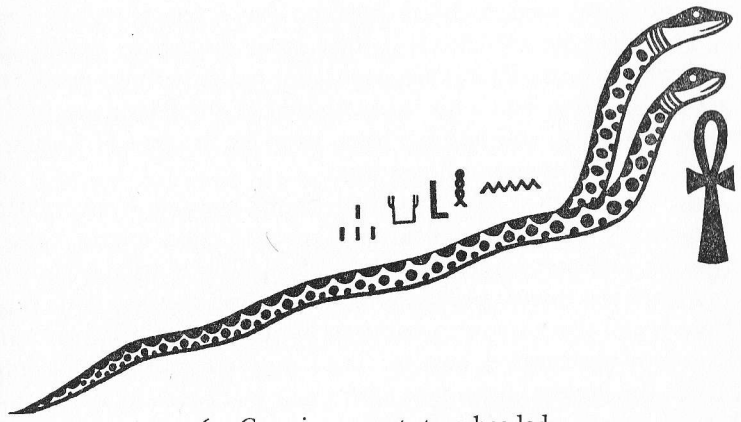
This is what they did. They hid the natural tincture and introduced in its place their non-natural tincture, and they handed these procedures on to their priests, and, if the village-folk neglected the sacrifices, they prevented them from succeeding even in the non-natural tincture. All those then who learned the so called doctrine of the *daimons* of the time fabricated waters, and, by reason of custom, law, and fear, their sacrifices multiplied.

However, the *daimons* did not fulfil even the false promises that they had made. But when there had resulted a complete change-round of the *klimata* [meaning unclear here, apparently some matter of astrological zoning] and the region was devastated by war and the human race disappeared from it.[22] When the temples of *daimons* were nothing but a desert and their sacrifices were neglected, they began to flatter the surviving men and persuaded them by dream, on account of their falsity, and by many presages, to adhere to the sacrifices. And as they renewed their false promises of non-natural tinctures, all the unhappy men, devoted to pleasure and ignorant, were filled with rejoicing.

They want to do all this to you too, woman, through the intervention of their pseudo-prophet. These local *daimons* flatter you; for they hunger not only for sacrifices but also for your soul.

Clearly Theosebeia has come under the influence of alchemists whose methods are considered wrong-headed by Zosimos. Hence his long diatribe. We could make more sense of his remarks if we knew better just what he means by the Tinctures. He suggests a considerable amount of work being done on them;





61. Cosmic serpent, two-headed

perhaps, however, he is speaking of a particular area, presumably that of Panopolis. For, after using general terms, he comes down to a single region which has had a very bad time and been almost depopulated. He infers that both the villagers and the priests had a strong interest in the manufactures connected with the tinctures, and that the methods of which he disapproves were linked with particular cults, which profited from the work being done by their devotees. His language suggests the local gods of the Egyptian nomes, but the general tone of his protest implies gods involved in the astrologic systems. It is quite possible that the region of Panopolis, which lay downstream from Thebes, Dendera, Abydos, in Upper Egypt, had suffered from warfare not long before 300. In 172 there had been the revolt of the Boukoloi, native auxiliary troops stationed in the Delta. An Egyptian priest Isidoros led the revolt, which was marked by a fierce nationalist feeling. Further, the social and economic crisis that set in in the mid-3rd century led to a weakening of military controls, and there were incursions of desert-nomads, Libyans and Blemmyes. The latter had appeared in the Thebaid, it seems, from 253; the prefect-usurpator organised an expedition against them about 260. And Firmus, who occupied Egypt (probably in the name of the Palmyrene princes) was allied with the Blemmyes, who figured in the 274 triumph of Aurelian. Worse, under Probus, these tribesmen made a fresh attack and reached as far as Ptolemais, not far upstream from Panopolis, where the rebellious townsfolk welcomed them. Between the years 258 and 294

we do not have a single dated ostrakon that comes certainly from the Theban region.[23] There is thus every reason to think that some areas around Panopolis, especially perhaps those nearer to Thebes, had been badly hit by incursions of the Blemmyes in the later 3rd century; and this fact helps us to fix the date of Zosimos round 300 or the early 4th century.

That other alchemists with rival claims were at work nearby is shown by Zosimos' appeal to his sister cited above. Again in *On the Treatment of Magnesia* he writes, "My blessed girl, turn away from the useless principles of those who confuse your ears. I have heard that you're in converse with the virgin Paphnoutia and other uneducated persons; and you attempt to put into practice the useless and empty fables that you hear among them." Of these opponents of his he names also "Neilos, your priest".[24] Unless the phrase is used ironically, here is further evidence that the priests played a leading part in the tincturings that Zosimos disliked. He now makes a final call on his sister, setting out his ideal alchemist.

Then do not let yourself be drawn this way and that, like a woman, as I have already told you in my book *According to Energy*. Do not be agitated off in all directions in the quest of God, but remain seated at your hearth and God will come to you—he who is everywhere and who is not limited to the lowest space like the *daimons*. In this calm repose of body, lull to repose also your passions, greed, pleasure, anger, chagrin, and the dozen lots [*moirai*] of death. And so, correcting yourself, call the divinity to you and it will truly come—it being what is everywhere and nowhere.

Then, without even being invited to do it, offer sacrifices to the *daimons*, not those who profit from them [the false alchemists], not those who nourish and comfort them, but those who chase them off and make them disappear, those whose formula Mambres gave to Solomon King of Jerusalem, and those who that Solomon himself has written out of his own wisdom. By acting in this way, you will gain the genuine timely and natural tinctures. Do all this until you attain perfection of soul. And when you realise that you've been made perfect, then, having gained the natural tinctures, spit upon matter, find your refuge with Poimandres, and, having received the baptism of the *Krater*, hurry on to rejoin your own people.

I now come however to the task that Your Imperfection sets me. But I must first expatiate a little more and consider afresh the object of our inquiry. I must not show myself inferior and the theme is one that is easy to get out of focus.



This eloquent passage makes clear further why and how Zosimos dislikes those who seek magical methods of compulsion, formulas or procedures for seeking out a deity. His moral and philosophic position implies a similar sort of patience and acceptance in dealing with the processes of matter. There must be no forcing of conclusions, no attempts to find short-cuts. The alchemist must learn by a total acceptance of the phenomena and of their systems of inner organisation or dynamic transformation. If he has any use for magic, it is in a wholly negative sense: in order to drive away all outward interferences of man or spirit. His Mambres may be a transcription of Memra (The Word of God personified: Mmra or Mambres), but is more likely a form of Iambres, whom we noted above as one of the Egyptian wizards opposing Moses. There was a considerable apocryphal literature of Solomon, to whom exorcisms were particularly attributed.[25] Zosimos, we see, knows the Hermetic Poimandres and accepts the idea of the *krater*-baptism.[26] The ironic use of the form of address, *Your Imperfection*, suggests that fully initiated alchemists formally called one another *Your Perfection*.

After the above passage there is a gap. He apparently cited Hermes; for he goes on, "Listen what he says soon after: The two Eggs, having been drunk down, are only a simple thing, which has become diverse, with one part humid and cold, another part dry and cold, and these two make up only a single work." Then after repeating, "But now I come to the assigned task," he deals with processes of timely tincturing, one by raw tincture, the other by cooking. The second kind he subdivides according to the liquids used (water or wine) or the furnaces or the duration and strength of the fires." He concludes, "These tinctures are then the faculty of corrupting a large quantity as well as a small one, in the sense that one obtains them as well in glass furnaces [?] as in large or little crucibles, and in various apparatus by means of fires and through the force of fires. Experience is what will prove

62. Ouroboros on a magical gem (with inscription IAOABRASAX)

it together with uprightness in all matters of the soul. As for the demonstration of the fires and all the things in question, you have them in *The Letter Omega*. It is from this point then that I am going to begin, purple-adorned woman."[27]

He here brings out succinctly how the ascetic way of life, rejecting all the lures of the world, is seen as only the other side of the intellectual and technical struggle to strip material process down to its essentials. The devoted concentration of the alchemist is one aspect of experimental work which includes the discovery of the pure pattern of change and development.[28]

# 16

# More on Zosimos

WITH Maria, Kleopatra and Zosimos we have then entered upon solid historical ground. Bolos of Mendes certainly existed and made a crucial contribution of some sort, linking the more daring aspects of the thought of Demokritos with Iranian and Egyptian systems; but it is hard to distinguish him clearly. With Hermes, Ostanes, Agathodaimon, Isis, Pebechios and the others we are in a confused territory, where mythical figures are used by a blurred series of writers and at best we can make out certain tendencies or schools. Maria with her inventive love of apparatus and Kleopatra with her lyrical sense of the renewal and transformation of life are, however, felt as definite characters, even if it is hard to make out where they worked and what were their circumstances. With Zosimos, despite many difficulties, things are quite different. Here is an indubitable practitioner living about 300 in Upper Egypt, at Panopolis, who is making a strenuous effort to maintain the practical side of the art, while responding to the various tendencies of his world (Gnostic, poetic, philosophic) and seeking to build a stable system of theory. One interesting aspect of the development of alchemy in the Roman era is the role played by women. Apart from the important work done by Maria and Kleopatra, there is Theosebeia and Paphnoutia. Though Zosimos indulges in one quip about woman's fickle mind, he clearly takes the development of his sister as seriously as if she were a brother or son.

His treatise *On Virtue* gives us his imaginative vision of what alchemic process meant. This work and Kleopatra's *Discourse* are the great documents of alchemy, which give us a rich and profound insight into the minds and spirits of practitioners when the whole thing was still fresh, in its first full creative outburst. The treatise deals with the composition of the Waters, but is in fact an account of what the alchemist saw and felt as the innermost

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meaning of the process in which he considered himself as much involved as the minerals.

The composition of the Waters, the movement, growth, removal and restoration of bodily nature, the separation of spirit from body, and the fixation of spirit and body, are not due to alien natures, but to a single nature reacting on itself, a single species, such as the hard bodies of metals and the moist juices of plants. And in this system, single and many-coloured, is comprised a research, multiple and varied, subordinated to lunar influences and to the measure of time, which rule the end and the increase according to which nature transforms herself.

Saying these things, I went to sleep, and I saw a sacrificing priest stand up before me on the top of a bowl-shaped altar. Fifteen steps led up to this altar. Then the priest stood up and I heard a voice from above saying to me, "I have completed the descent of the fifteen steps of darkness and the ascent of the steps of light, and it is he that sacrifices who renews me, casting away the coarseness of the body, and, being consecrated priest by necessity, I become a spirit."

So I heard the voice of him standing on the bowl-shaped altar, and I questioned him, wanting to find out who he was. He answered in a frail voice, "I am Ion, the sanctuary's priest, and I have survived intolerable violence. For in the morning one came headlong, dismembered me with a sword, and tore me apart according to the rigours of harmony. And flaying my head with the sword held fast in his grip, he mingled my bones with my flesh and burned them in the fire of the treatment—till I learned by the transformation of the body to become a spirit."

While he spoke these words and I compelled him to speak, his eyes became like blood and he vomited up all his flesh. And I saw him as a mutilated little image of a man, tearing himself with his own teeth and falling away.

And I awoke in my fear and I thought, "Is this not the situation of the Waters?" I believed that I had understood it all well and again I fell asleep.

And I saw the same bowl-shaped altar and at the top the water bubbling and many people endlessly in it. And there was no one outside the altar whom I could ask. Then I went up to the altar to see the sight. And I saw a little man, a barber whitened by years, who asked, "What are you looking at?"

I replied that I wondered at the boiling of the water and the men burned yet living. And he answered me, "It is the place of the exercise called preserving [embalming]. For those men who wish to gain virtue come here and become spirits in their flight from the body."

So I said, "Are you a spirit?"

And he replied, "A spirit and a guardian of spirits."



And while he told us these things and while the boiling increased and the people wailed, I saw a man of copper with a writing-tablet of lead in his hand. And he spoke aloud, looking at the tablet. "I advise those under punishment to compose themselves and each to take in his hand a leaden writing-tablet and write with his own hand. I advise them all to keep their faces upwards and their mouths open until your [*sic*] grapes are grown.

The action followed the word, and the master of the house said to me, "You have seen. You have stretched your neck on high, and seen what is done."

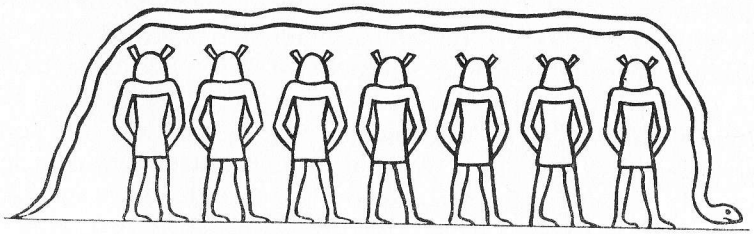
And I said that I'd seen, and I said to myself, "This Man of Copper you have seen is the sacrificing priest and the sacrifice and he who vomited out his own flesh. And authority over this Water and the men under punishment was given to him."

And having had this vision, I woke again and said to myself, "What is the occasion of this vision? Is not this the white and yellow Water, boiling, divine [sulphurous]?" And I found that I understood it well. And I said that it was fair to speak and fair to listen and fair to give and fair to receive and fair to be poor and fair to be rich. For how does the nature learn to give and to receive?"[1]

The chemical basis of the vision is doubtless the reaction between metals and a reagent, the breakdown of the metals, and their final restoration to a metallic condition: the change from body to spirit and then to body again at a higher level, a different qualitative level. But because the process involves all natures, all lives, it is also a human drama of suffering and renewal. The bowl-shaped altar is the alembic-womb of transformation. In Vedic India the sacrificial altar, *vedi*, was female, and the ritual fire, *agni*, male; their union brought forth offspring. The *vedi* is compared with the earth-naval, *nabhi*, the centre, which was also the womb of the Goddess. The altar-womb is again the cauldron of renewal, which we meet in Greek and Celtic myth and ritual.[2] Further, the *Brahmanas* depict the making of the individual (a microcosmic expression of the general cosmogony) by means of rituals, in which the priests collect and assemble the *atman* in order to bring about a perfect whole. The model of their procedure appears in the myth of Prajapati who becomes "unstrung" and is put together again; his putting-together is identified with the construction of a fire-altar. "With his joints unstrung he was incapable of standing up, and the gods put them together again by means of sacrifices." Thus sacrifice, which is in one sense a rending-apart of the unity of things, appears also as a restoration

of the unity, and the altar is the place where this breakdown and reunification (or rejuvenation) takes place; the sacrificer, during the rite, becomes the whole universe, its demiurgic energies. The three stages of Prajapati, we may note, correspond to the triadic formula, the three stages of alchemic change. First comes the embryonic stage (the return to chaos and primary matter), which is extremely dangerous; then the formation of the new body and the successful birth; then the achievement of power or stability. The rites of consecrating a king (*i.e.* of renewing cosmos) in this third phase take the form of establishing him as Kosmokrator; he raises his arms, symbolising the setting-up of the world-axis. At final consecration he stands on the throne with arms thus raised, imitating the axis fixed in the earth-navel and reaching to the sky; his asperging symbolises the descent of the Waters out of the Heavens along the axis to fertilise the Earth; and he takes a step towards each of the four cardinal points and symbolically mounts to the zenith.[3] The body here, set in the axial line of the flow of cosmic force, is repeating the up-down pattern we traced in *Imakh-sa-Pesevj*. In Greek craft-myth Chalkos the man-of-bronze must have been considered a product of bronze-process; and we find related names – Chalkodon, father of Chalkiopeian (bronze-faced) which in turn suggests Chalkis in Euboia and its bronze industry.

The hoary-headed barber may seem out of place in the situation; but barbers had always been connected with cosmetics and beautification, which were regarded as works of transformation. They themselves concocted cosmetics, or else bought them from the *unguentarii* and *rhizontes*, botanists, who as part of their trade made perfumes. We may note too that the barber here comes in at a moment of preservation or embalming; he could be viewed as a surrogate of the embalmer. To change looks and especially to



63. Seven forms of Osiris, serpent-enclosed



give a youthful life-enhancing appearance had its magical values; the processes originated in a mixture of religious, magical and medical rites. The dead were unguented and perfumed to aid their resurrection; the living used the materials on festival or ritual occasions when the earth was momentarily merged with the spirit world. The Edwin Smith Surgical Papyrus, dated to the 16th century B.C., has recipes on its back that probably belong to the period of its transcription. Transformation and beautification are identified:

*Recipe for transforming the skin*: Honey 1, red natron 1, northern salt, 1. Triturate together and anoint with mixture.

*Another recipe for beautifying the face*: Alabaster grains 1, natron kernals 1, northern salt 1, honey 1. Mix together and anoint.

One long recipe runs thus:

*Beginning of the Book of Transforming an Old Man into a Youth.* Let there be brought a large quantity of fenugreek fruit about 2 khar. It should be bruised and set in the sun. When it's quite dry, let it be husked as grain is husked, and it should be winnowed until only the fruit remains. Everything that comes from it shall be measured and let the husks be sifted after the way of the threshing-floor with sieves. Also measure everything that comes from these fruits and make them into 2 equal parts. One made up of these fruits, the other of the husks. Treat one like the other [make them alike].

Let the whole be set aside mixed with water. Make into a soft mass and let it be set in a new jar over the fire and cooked very thoroughly, making sure they boil, evaporating the juice and drying them till it is like dry, without moisture in it. Let it be removed from the fire. Now when cool, let it be put in another jar so as to wash it in the river. Let it be washed thoroughly, making sure they are washed by testing the taste of this water that's in the jar, till it has no bitterness at all. It should be set in the sun, spread on the launderer's [bleached] linen.

Now when it's dry, it should be ground on the grinding quern. Let it be mixed with water. Make like a soft mass and let it be set in a jar over the fire and thoroughly cooked, making sure that it boils, that little drops of oil may go out from it. A man shall dip out the oil that has come of it, with a dipper. Put into a *hin*-jar after coating the inside with clay. Knead and make thick its consistency. Dip out this oil and pour on a linen sieve into the top of this *hin*-jar. Afterwards it should be put in a vase of costly stone [alabaster].

[*Directions*] Anoint a man with it. It is the remover of wrinkles from the head. When the flesh is smeared with it, it becomes a beautifier of

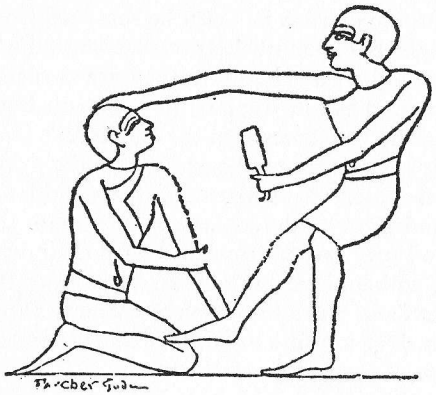
the skin, a remover of blemishes, of all disfigurements, of all signs of age, of all weaknesses that are in the flesh. Found effective myriads of times.[4]

This recipe is on the same line as the mixtures of oatmeal or almond-meal and water, used by modern cosmetic-experts to remove wrinkles. We can see that a barber is not so out of place in Zosimos' Visions as we might at first think. Zosimos goes on:

The Copper Man gives and the watery stone receives; the metal gives and the plant receives; the stars give and the flowers receive; the sky gives and the earth receives; the thunderclaps give the fire that darts from them. For all things are interwoven and separate afresh, and all things are mingled and all things combine, and things are mixed and unmixed, all things moistened and all things dried, and all things flower and blossom in the bowlshaped altar.

For each it is by method, by measure and weight of the four elements, that the interlacing and dissociation of all is carried out. No bond can be made without method. It is a natural method, breathing in and breathing out, keeping the arrangements of the method, increasing or decreasing them. When, in a word, all things come to harmony by division and union, without the methods being neglected in any way, the nature is transformed. For the nature being turned upon itself is transformed; and it is the nature and the bond of the virtue of the whole world.

This insistence on consistency and pervasiveness of method is in the key of the *Commentary on Omega*; and it seems odd to us in the



64. Egyptian barber and customer



post-Galilean world that Zosimos did not see the need to follow up this respect for "method, measure and weight", by attempting precise quantitative assessments of his experiments and their ingredients, at least to the extent that the existing crude instruments and apparatus permitted. Once the alchemists had seriously begun the quantitative inquiry they would soon have refined the instruments. But the deep concentration on qualitative changes blinded them to this aspect of the situation and its vast possibilities —just as the discovery of quantitative methods by Galileo and his successors had the effect of blinding scientists to the importance of moments of crucial change with their qualitative problems.

In the passage with which Zosimos follows on, we meet again the symbol of the Temple for the Universe conceived as a single region of living forces; but this temple-cosmos is also the alchemic laboratory.

And that I may not write many things to you, my friend, build a Temple of One Stone, like ceruse in appearance, like alabaster, like marble of Prokonnesos, with neither beginning nor end in its construction. Let it have inside, a spring of pure water glittering like the sun. Note on which side is the entry to the temple, and take your sword in hand and go in quest of the entry.

For narrow is the place where the temple opens. Before the entry lies a serpent guarding the temple. Seize and sacrifice him. Skin him, take his flesh and bones, and separate the parts. Then reunite the members with the bones at the temple-entry, make of them a stepping-stone, mount on them, and go in.

You will find there what you seek. For the priest, the man of copper, whom you see seated in the spring and gathering his colour, do not regard him as a Man of Copper. He has changed his nature's colour and become a Man of Silver. If you wish, after a while you'll have him as a Man of Gold.

The second Lesson resumes the story. The seven steps are those of the planetary ladder and of the Mithraic ordeal-stages; Zosimos elsewhere, we recall, named alchemic process the Mithraic Mystery.

Again I wanted to climb the seven steps and look on the seven punishments, and, as it came about, on only one of the days did I manage the ascent. Retracing my steps, I then went up many times. And then on my return I failed to find the way and fell into deep discouragement, unable to see how to get out, and dropped asleep.

And in my sleep I saw a little man, a barber, wrapt in a royal robe

and a royal dress, standing outside the place of the punishments, and he said to me, "Man, what are you doing?"

And I said to him, "I stand here because I've lost my way and don't know what to do."

And he said, "Follow me."

And I went and followed him. And as I came near the place of punishments I saw the little barber who was guiding me cast into the place of punishments and all his body as consumed with fire.

At the sight I fled and trembled with fear, and I awoke and said to myself, "What is it I've seen?" And again I reasoned, and then, seeing that the little barber was the Man of Copper clothed in red clothes, I said, "I've understood it well. This is the Man of Copper. He must first be cast into the place of punishment."

Once more my soul desired to ascend the third step as well. And once more I went along the road, and as I neared again the place of punishment, I missed my way. I lost sight of the track and wandered in despair. And again in the same way I saw a whitehaired old man of such whiteness as to dazzle the eyes. His name was Agathodaimon. This white old man turned and looked at me for a full hour. And I asked him, "Show me the right way."

He didn't turn towards me, but hastened on to follow the right route. And going and coming thence, he soon reached the altar. As I went up to the altar I saw the whitened old man and he was cast into the punishment. O gods of heavenly natures, at once I was wholly embraced by the flames. What a terrible story, my brother. For from the strength of the punishment his eyes became full of blood. And I asked him, "Why do you lie there?"

But he opened his mouth and said, "I am the Man of Lead and I am undergoing intolerable violence."

And so I awoke in great fear and sought in myself the reason of this fact. I reflected and said, "I clearly understand that thus the lead must be cast out. And indeed the Vision is one of the Combination of Liquids."

Thus ends the Second Lesson. We feel throughout the alchemist staring into fire and into the changing metal with all its minute and large modifications of texture and state. In a semi-trance condition of absorption he draws the picture into himself and is himself drawn into the seething mass. Patterns, momentarily stark and immediately evanescent, appear, meaningless and sharply evocative of meaning. Everything is revealed and understood, and nothing; for the hurry of change is beyond the grasp of the lagging mind and what is seen and grasped is a small moment of a vast involved whole. In the violent landscape of the



fire the human image survives, suffering and indomitable. And because the tranced observer is not simply delivering himself up purposelessly to the flicker and fury of impressions, but has a clear idea of an underlying structure in the chaos of change, he finds a direction and a coherence in the images which emerge. When, later, he seeks to sum up his experience, he finds that the union of man and matter, which was the strongest emotion of his trance-absorption, objectifies itself in a series of images, drawn from initiation-moments. Those moments are felt to express a pattern which is shared by both man and matter, by nature in all its forms and manifestations; for in it is defined the pure pattern of change.

65. Egyptian lady using lipstick

Along some such lines I think we can explain the Visions as also the imagery of Mating, Gestation, and Birth in Kleopatra's discourse. The accounts are not merely inventions of an intellectual kind; they are true poetry. In them the narrator is convinced of the deep essential truth of what he says; he feels that he has grasped the pattern which tantalisingly eluded him as he watched and that he is not at all imposing this pattern on the experience. Lesson Three is shorter than the others:

And again I saw the same divine and sacred bowlshaped altar, and I saw a priest in white clothes celebrating those dreadful mysteries, and I said, "Who is this?"

And he replied, "The priest of the Sanctuary. He wants to put blood into the bodies, clear the eyes, and raise up the dead."

And so I fell again and slept for another little while, and then, as I went up the fourth step, I saw one coming from the East with a sword in his hand. And I saw another behind him, who carried a round white shining object beautiful to see, of which the name was the Meridian of the Sun (or Cinnabar). And as I neared the place of punishments the one with the sword spoke to me:

"Cut off his head and sacrifice his meat and his muscles in sections so that his flesh may first be boiled according to method and that he may then experience the punishment."

And so, waking once more, I said, "I understand thoroughly that these things deal with the Liquids of the Art of Metals."

And again the one with the sword said, "You have completed the seven steps below."

And, at the same time as the casting-out of the load by all liquids, the other said, "The work is perfected."

We can link the imagery of the men of metal with a large number of ideas about living or divine statues of the period, as also with the idea of the alembic-womb which produces a living being. In turn we could look forward to the medieval ideas of the *homunculus* begotten by magical or alchemic means. The *homunculus* already appears in the deeds attributed to arch-magician Simon Magus:

I, I by my power, turning air into water and water again into blood and solidifying it into flesh, formed a new human creature—a boy—and produced a much nobler work than God the Creator. For he created a man from the earth, but I from the air, a far more difficult matter. And again I unmade him and restored him to air, but not until he had placed his picture or image in my bedchamber, as a proof and memorial of my work.[5]

And an interesting passage by an Arab poet Ibn Shuhaid (A.D. 992–1035) about a laboratory shows that a practice had grown up of constructing statues to represent the men of lead and of gold, of primary and of liberated matter, and to set them as guardians or presiders over the scene of operations. The poet is writing about al-Faradi and telling how he got on bad terms with him.

I got on friendly terms with him some time ago, at the time we went to [live at] al-Zahura, when these places were still standing, not obliterated, and brilliant with the family of 'Amir. We were wont to discuss together branches of learning [like] literature, tradition, jurisprudence, medicine and philosophy. Yet amongst wise people was [as useless] as the otiose *waw* in 'Amir or the clitoris in a vulva. He



was cheating and deceiving, without my knowledge, stealing money and living on the proceeds. But it became as evident as daylight or the sound of a reed-pipe. If he touched full moons they would be changed into counterfeit coins; if he handled suns he would cover them with eclipses.

I went to visit him one day, not knowing his character, to rest with him and entrust him with some matters.[6]

In so doing, he blundered by chance into the laboratory. Such an intruder was liable, it seems, to violent treatment; but the poet, realising where he was, bluffed his way out by pretending to be a fellow-alchemist:

Finding his door open and the doorkeeper absent, I went inside and a callow boy approached me and said, "How long have we been waiting for you!" He walked in front and I followed him into a room blackened and covered with smoke like fragments of rain clouds, and smelling of the foul stench of arsenic, sulphur, cinnabar, and carcocolla. I remembered [the verses] "The day when the sky brings conspicuous smoke to cover mankind. This is painful punishment." I sensed the presence of evil and wanted to flee. Then I looked around and behold! I saw heaps of coal, apparatus for the extraction of gold, and black and yellow statues.

Then I arrived at a room full of figures like executioners, black and with pincers in their hands, standing in rows and grasping hammers. When they saw me, they shouted, "This intruder has discovered you. Destroy him immediately."

I saw death and feared the issue of the business. So I laughed at them and said, "You have fallen short of benevolence and missed the path of wisdom. Are you so hasty, knowing not whom you seek?"

[They said, "Who are you?"]

I replied, "He who took amianthus and powdered it with a pestle, and who extracted with the hand of intelligence the essence of things, thus announcing the birth of sons to fathers."

They said, "[Do you use] fire or water?"

I answered, "Both, and air also."

So they looked at me laughingly and welcomed me, apologising. They said, "By God, you were on the point of being devoured and carried off by death."

I asked, "Where is Abu 'Abd Allah?"

And they replied, "Gone off to dilute the fluid of eggs and concentrate menstrual blood. His aim is to extract the tincture of the Philosopher's Stone."

I said, "Is it a new fluid or an old?"

And they shouted, "Ah! here is an expert."

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Then I bore myself pleasantly till I left, my feet flying under me. God in his mercy had kept my blood inside and rescued me from the hands of death.

Apart from the mention of the Black and Yellow Statues, this passage has a striking picture of a laboratory of the period, which was certainly on a more ambitious scale than anything we can imagine in the period of Zosimos. The pincers and hammers suggest some breaking-up or treatment of ore and minerals as distinct from purely chemical work. What may have been a laboratory of the 6th-7th centuries has been found to the south-west of Siut in Egypt, at the foot of the mountain, in a Moslem cemetary established amid an ancient nekropolis. About 12 to 13 metres deep was a funerary chamber belonging to a deep burial-place already robbed. This led into a room serving as a laboratory as shown by the smoke grimed on the walls. There was a bronze furnace, a bronze door (about 35 m. high) coming from a larger oven, about fifty spouted vases of bronze, each in a sort of truncated cone also of bronze—the upper hole being the larger one. There were also seven basins of alabaster, a rounded Old-Kingdom vase of diorite or green jasper, spoons of alabaster, objects in base gold (weighing 96 dirhems) composed of pieces that had the look of large rolled-up leaves, and a twisted bent mummy-mask. These latter objects seem to have been prepared for casting. The room must have been the work-place of an alchemist or forger.[7]

Finally, with regard to the Visions we may note how the whole idea of a series of transformations harmonises with the ancient Egyptian funerary ritual in which the dead man changes into animal and other forms. The ultimate basis of these ideas lies in the shamanist death-ritual in which the performer, in a state of semi-possession, mimed the various dangers, encounters, ordeals of the dead man on his way to a secure place in the spirit-world. At the Egyptian stage the impromptu performance of the shaman has given way to a carefully codified system of magic; but the essence is the same. In the Saite recension of a chapter (XX) of *The Book of the Dead* the rubric reads:

If this chapter be recited regularly and always by a man who has purified himself in water of natron, he will come forth by day after he has come into port [is dead] and he will perform all the transformations which his heart will dictate, and he will come forth from the fire.[8]



Note that the transformations are imagined as the result of a passage through fire. One transformation is into a hawk of gold.

I have risen, I have risen like the mighty hawk [of gold] that comes forth from his egg. I fly and I alight like the hawk which has a back 4 cubits wide and whose wings are like the mother-of-emerald of the south. I have come from the interior of the Sekhet boat, and my heart has been brought to me from the mountain of the east. I have alighted upon the *Afet* boat, and those who were dwelling in their companies have been brought to me, and they bowed low in paying homage to me and in saluting me with cries of joy.

I have risen and I have gathered myself together like the beautiful Hawk of Gold which has the head of a Bennu bird [Phoenix], and Re enters in day by day to hear my words. I have taken my seat among those firstborn gods of Nut.

There is thus a direct line of tradition from the shamanist initiation-ritual of sky-ascent and underworld-descent and the alchemic initiation-ritual of god-revelation and transformations in body-spirit. The alchemic system has lifted the ideas and images on to a new level and integrated them in a complex of technological and philosophical positions which give them a new significance; but the link is none the less real and illuminating.

Zosimos does not seem to have introduced any radical new methods or theories. We may take his work to have consisted mainly in an attempt to bring together, clarify, codify, and rationalise what he considered to be the best elements in all the previous ideas and experiments. At the same time, as we saw, he widened the whole horizon by drawing on Gnostic and philosophic systems of his world when he felt that those systems helped in illuminating the alchemic position. Alchemy in its various ramifications had already had much effect on the general world of thought, so that to some extent Zosimos was thus reclaiming for his art ideas which had ultimately originated from it.

In the Visions he mentions Agathodaimon. His role there is not quite clear. He appears after the little barber is recognised as the Man of Copper, and leads the way to the altar-apparatus where he turns into the Man of Lead. Zosimos thus seems to link Agathodaimon with copper, which, if our sources are at all complete, is correct; but since Agathodaimon ignored lead, Zosimos either shows ignorance on this point or else deliberately makes the connection as a sort of refutation or attack on the

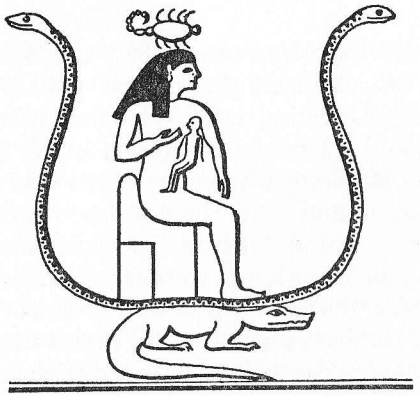
Harran-position. The lead-phase, he insists, is necessary. Indeed, if we are right in taking his Omega to belong to Kronos in a system of correspondences linking letters, planets and metals, then Omega here may well be a synonym for Lead. The association of metals and planets was never rigidly systematised, but lead usually went to Kronos; such a heavy, dull metal was naturally joined with the slowest-moving planet. The only other claimant for lead was Osiris, whose sole similarity to Kronos lay in his mutilations. Osiris was at times identified with the water into which he died and from which he was revived, the water of death and resurrection-fertility; and as water he may have been associated with lead in its easy fusibility. His Tomb was connected with mercury. Olympiodoros compares *chēmia* to the Tomb of Osiris in which the god's members were hidden though his face was shown (*i.e.* the body mummified in its coffin-case).[9] However, Kronos was the main deity identified with lead. So in a treatise on Omega-Kronos-Lead Zosimos would be expressing his belief that in lead was the basic substance on which the alchemist must build, creating his primary matter and then going up the scale. Agathodaimon was symbolically forced to recognise this point by being plunged into the lead-death in person.

The Harran school, as well as taking copper as the basic metal, refused to allow any other substances than minerals in their experiments. In opposition the school of Bolos-Ostanes discovered the use of sal-ammoniac distilled from organic substances such as eggs: which must have given a strong impulsion to the imagery of the cosmic or seminal egg. We seem to distinguish here a point of conscious conflict between Zosimos and the Harran school, which makes all the more likely that his use of Agathodaimon as the Lead-Man was polemical. He seems to have found it hard not to believe that Agathodaimon was speaking figuratively and that by the Stone he actually meant urine or dung, from which sal-ammoniac could be got. In an Arabic translation of one of the treatises to Theosebeia he says, "In my opinion it [the Stone] is Sal-Ammoniac."[10] Al-Razi remarks that as eggs could be got for a small sum, the saying of Demokritos about a Stone not a Stone was confirmed.

Zosimos then for all the extensiveness of his work was no mere compiler. He had definite ideas about both the correct procedures and methods, and the true theory. He rejected the attitude that only minerals should be involved in transmutation, and he



denounced the empirical school that had grown up in Egypt. But though he clearly had a strong nationalist feeling, he admired and used the work of Maria the Jewess. In him the alchemy of the ancient world reached its height. His insistence on the unity of theory and practice does not seem to have long survived him. The further history of Greek alchemy is almost wholly one of repetition and of rhetorical exploitation of the previous gains, with a weakening grasp of practice.[11]



66. Scorpion-goddess Serquet in her serpent-boat propelled by a crocodile

# 17

# The Later Greek Alchemists

THE apex of Greek alchemy was reached with Zosimos: the fullest development of combined theory and practice. No doubt a certain amount of practical work was done after his period and various recipes added to the repertory; but it seems clear that nothing of any importance was discovered and no extension of theory made. More and more the exponents turned to glorifications of the art in a lofty rhetoric in which the paradoxes and antitheses of the alchemic idiom were exploited for their own sake. The practical side shifted more to Syria. However, to complete our picture we had better glance at the names that now come up.

We have seen abundantly how one side of alchemy linked with the many esoteric or mystery cults of the epoch, with the whole vast development of magic and theurgy. In those cults and rites there had been uttered the enormous despair of the masses of the Hellenistic and Roman periods, the desperate sense of being cornered in a hopeless situation, together with an endlessly revived attempt to break through into a new life, whether through the lonely incantations of the magician, the resistances of isolated groups such as the Gnostics, or the large-scale struggle to affirm a total opposition to the "World" (the existing State-form, the cash-nexus, and all the forms of class-division) in a creed like early Christianity.

It is indeed of interest to note the several points of likeness in that creed and in the alchemic outlook. There were many aspects of the secret cult among early Christians. Origen was still able to declare to Celsus, "Then, and not till then, we invite them to our mysteries, [*teletai*]; for we speak wisdom among the perfect [*teleioi*, initiated]." He echoed what Paul had said, "But we speak God's wisdom in mystery, the concealed wisdom, which God ordained before the Aions into our glory, which none of the Archons of this Aion [Rulers of this Period] knew; for if they had



known, they had not crucified the lord of glory." Among the Gnostics, the perfect or initiated formed a higher group, of whom much was said by the Christian attackers of heretics. Mark states, "Unto you is given the mystery of the kingdom of God; but unto them that are without, all things are done in parables: that seeing they may see and not perceive." Matthew certainly referred to secret instruction: "Nought is covered that shall not be revealed, and hidden that shall not be known. What I tell you in the darkness, speak you in the light; and what you hear in the ear, proclaim from the housetops."[1]

We seem to hear there the tones of triumph of the section that wanted to break through the original secret cult and proclaim its message abroad.

Further, Christians developed the Last Supper into an act of communion in which ordinary substances, bread and wine, were thought to be transmuted, by the effects of ritual speech and action, into divine substances, the actual flesh of the Saviour, which the worshipper consumed. Behind such a rite was a long series of communions in religions of the mystery-type, which gave the devotee the conviction of becoming one with the god, a Bacchos of Bacchos, and so on, and which went back in origin to the tribal ceremonies of eating the totem (which was of one flesh with the tribe) on special occasions. But in the Christian eucharist the primitive kind of communion-meal was made far more precise in its idiom: the substances were conceived as undergoing a process of transformation. Here we see a clear imprint of the alchemic idea in its elixir-form.The term eucharist seems established by the time of the *Didache*, which implies it as a sacrifice. St Ignatios calls the eucharist "the breaking of one bread, which is the medicine of immortality, the antidote against dying". The idiom is exactly that of Kleopatra in her *Discourse*, where she speaks of the medicine of life. Again we are told, "Those who deny the gift of God, by their disputing come to death. But it would be far better for them to keep the *agapē* [the love-feast] so that they may rise again."[2] The eucharist was an immortalising *pharmakon*. God's power was thought to take up its dwelling in the consumer of Christ's body; hence the phrase, "We thank you that you are Mighty." Jesus became in the patristic tradition the Great Doctor, Our Great Doctor. "He treats them by the process of a sublime medicine."[3]

Following Zosimos in the later 4th century there seem to have come several lesser figures such as Pelagios, Dioskoros, Synesios. Pelagios the Ancient cites Zosimos as well as the dictum about wheat producing wheat, gold producing gold. Dioskoros seems to have been a priest of the great temple of Sarapis at Alexandreia; Synesios addressed to him his Commentary on Demokritos.[4] This Synesios has been identified with the Neoplatonic friend of the astronomer Hypatia, who finally became bishop of Ptolemais in Kyrenaika. If the identification is correct, Synesios was an alchemist in his youthful days; for he was born about 365–70 and the Sarapieion was destroyed in 390—though it is barely possible that he was writing to a man who had been a priest of the temple in the past and that he deliberately ignored the destruction. He was in fact an eclectic in his beliefs and had his bishopric thrust on him not long before 409; he accepted it rather as a social duty than because of any religious urge. "Philosophy is all I am equal to," he said in dismay. He was certainly interested in the science of his period. A letter of his to Hypatia has the first known reference to an areameter; he wrote a treatise on dream-interpretation—on the alchemic side we may recall the treatise at the beginning of the St Mark manuscript as well as the recipes for procuring dreams in the Leyden Papyrus. In *On Providence* he tells an historical tale of administrative oppression and the fall of Gainas in terms of Egyptian mythology. He sets out the doctrine of *pneuma* and universal sympathies in arguing for the legitimacy of divination; and in *Dion* he puts the prophets Hermes and Zoroaster beside the Christian hermits Amous and Antonios as representing the supreme heights of wisdom. His hymns are full of Neoplatonic and Gnostic touches; he cries in true alchemic idiom, "You are father, you are mother, you are male, you are female, you are voice and you are silence, you are the nature producing nature."[5]

There is thus nothing in the character of the man that precludes a certain dabbling in alchemy. But apart from the difficulty about the Sarapieion, the work of the alchemist Synesios is dry in style, quite lacking the sophisticated elegance of Synesios of Ptolemais. It also lacks his careful modesty. In the dialogue the author sets out his opinions authoritatively, with his audience, a priest, grovelling in admiration. "You have excellently settled the problem, philosopher." "You have spoken well."[6] We may then conclude it is unlikely that he was our historical figure. Another possible claimant for the dialogue is the Synesios of



Philadelphia, a Lydian, His son Androkleides taught at the time of Porphyrios, who attacked him as one of the *empodoi technologoi*—a difficult phrase: *empodos* means "obstructive, causing difficulties" and *technologos* means a "writer on the art of rhetoric, one who lays down the rules". Presumably the *Souda*, from which the phrase comes, meant that he was a severe over-systematiser. As professions often went from father to son, the father Synesios was most likely also a rhetorician of some kind; and the connection of the son with Porphyrios suggests that the family lived in Egypt. However, the details are too meagre to lead to any conclusion.[7]

With the 5th century we come to Olympiodoros. In this case there seems no doubt that the alchemist was a known literary figure, who wrote a history of his own times. A native of Thebes in Egypt, he took part in an embassy to Attila under Honorius in 412; travelled among the Blemmyes in South Egypt and visited the priests of Isis at Philai, where pagan survivals persisted till 562. Photios called him *poietes*, poet in the original sense of maker —here alchemic operator; *poiesis* was a synonym for the great work. To him was attributed *Olympiodoros the Philosopher to Petasios King of Armenia on the Divine and Sacred Art*—which is also called in other manuscripts, *Commentary on the Book of Energy of Zosimos and on the Sayings of Hermes and the Philosophers*. The work is worth citing at some length to show the ruminative tone, with its effort to think back over the whole scene of Greek philosophy and to find just where alchemy came in and developed out of the main body of thought.[8]

> Fire is the primary agent, that of the whole art. It is the first of the four elements. Indeed the enigmatic language of the ancients as to the four elements refers to the art. Let your virtue examine with care the Books of Demokritos on the four elements. It's a matter of Physics. He speaks sometimes of gentle fire, sometimes of violent fire, and of charcoal and all that has need of fire. Then of air, of all that derives from air, animals that live in the air. Likewise of water, of the bile of fishes, of all that's prepared with fishes and water. Again he speaks of earth and of what is attached to it, salts, metals, plants. He separates and classifies each of these objects, according to colour, specific characteristics and sex, male or female. Knowing that, all the ancients veiled the art under multiplicity of words.
>
> The art indeed has complete need of these data; without them nothing is sure. Demokritos has said we can constitute nothing without them. Know then that I have written as well as my strength allowed, being feeble not only in discourse but also in spirit. And I ask you for your

prayers to deter divine justice from being wrathful against me for having the boldness to write this work, and to bring it to be propitious to me in all ways.

The writings of the Egyptians, their poesies, their doctrines, the oracle of the daimons, the exposition of the prophets, all treat the same subject . . .

Prove now your sagacity. Many names have been used for the Divine Water. That Water denotes what one seeks, and one has hidden the object of the quest under the name Divine Water. I am going to set out for you a little argument. Listen, you in possession of every virtue; for I know the torch of your thought and the tutelary good. I want to set before your eyes the spirit of the ancients. Philosophers, they held to its language and came to the art by way of wisdom, without harming philosophy in the least; they have all written clearly. In that they have been false to their oath; for their writings deal with doctrine and not with practical works.

In what follows it must be remembered that the Greek word *archē* means both "beginning" and "principle", since the quest for cosmic origins in the Ionian philosophers had involved a quest for the first element or substance from which things arose; this element was the principle of the cosmos.[9]

Some of the natural philosophers bring back the argument on the elements to the *archē*, in view of the fact that *archai* are something more general than the elements. Indeed the first principle resumes the whole of the art. Thus Agathodaimon, placing the *archē* in the end and the end in the *archē*, wants it to be the serpent Ouroboros . . . That is evident, O initiated . . .

Agathodaimon, what is he? Some hold he is an ancient, one of the oldest persons who occupied themselves with philosophy in Egypt. Others have called him the Heavens—perhaps because the serpent is the image of the universe. Indeed certain Egyptian hieroglyphics, wanting to trace the world on obelisks or express it in sacred characters, show the serpent Ouroboros. His body is constellated with stars. That is, I've been told, because he is the *archē*. Such is the view set out in *The Book of Chēmia*, where his figure is drawn.

I see now how it happens that the *archē* is something more universal than the elements. Let's state what is for us an element and at the same time what is the *archē*.

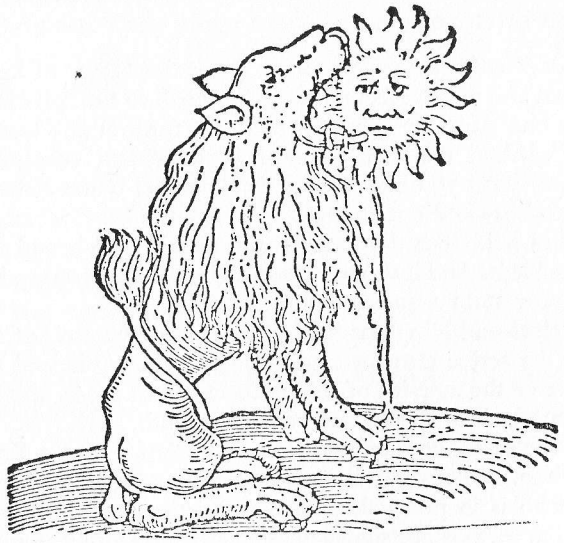
The four elements are the principle of the body; but every principle is not therefore an element. Indeed the Divine, the Egg, the Intermediary, the Atoms are for certain persons the *archai* of things; but these are not elements.

Let's seek then, according to certain signs, what is the principle of



things. Is it one or multiple? Is it unique, immobile, infinite, or determined? Are there several *archai*. If there are several *archai*, the same questions come up. Are they immobile, determined, infinite?

He then begins a catalogue of the early philosophers with their views on *archē*, origin and principle. We need not discuss here how right or wrong he is in the details of his assessment. What is striking is the dismissal of the notion of some immobile substance or god as the ultimate basis, though immobility or unchangeability had been regarded as the most desirable and noble condition that could be imagined by so many thinkers, early or late. Plato's Ideas were set outside the world of change or motion; Aristotle's God was the great Unmoved and there was circular movement but no change in the spheres above the moon in his universe. However, against the whole metaphysical current of ancient thought, Olympiodoros, speaking for the alchemists, declares that reality consists of "movement and rest"—that is, these united opposites make up the real world. We see then to some extent why the alchemist tradition attached itself to Demokritos, the outstanding example among those thinkers of whom we saw Aristotle protesting angrily, "They say there is always movement."



67. Later alchemic imagery: the Green Lion devouring the Sun (from *The Rosary of Philosophers*)

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The ancients admired one principle of all things, unique, immobile, and infinite. Thales of Miletos speaks of the Egg [a confusion or perhaps a deliberate play on words here between egg, *ōon*, and being, *on*]. It's a question of the divine water and of gold: it's a principle, beautiful, immobile. It's exempt from all apparent movement, and more, it is infinite, endowed with infinite power, and no one can number its powers.

Parmenides also takes for principle the divine, unique principle, immobile with determined power; it is, he says, immobile, and the energy that derives from it is determinate.

We note that Thales of Miletos, considering the existence of God, calls him infinite and endowed with infinite power; God is endowed with an infinite power. Parmenides says that for his productions God has only a determinate power; indeed it is throughout clear that what God produces corresponds to a limited power. Perishable things correspond to a limited power—though not so intellectual things.

These two men, I mean Thales and Parmenides, seem to be rejected by Aristotle from the band of natural philosophers. Indeed they are theologians concerned with questions alien to physics and they attach themselves to [concepts of] immobility. But all physical things move. Nature is the principle of movement and rest.

He then goes on to discuss the ideas held by the early thinkers about the *archē* as original and fundamental substance, stressing the aspect of movement.

Thales admitted water as an unique, determined *archē* of things since it is fecund and plastic: fecund as giving birth to fish, plastic as taking any form one wants to give it. It takes the form of any vase in which it's put, whether the vase is polished, terracotta, triangular, quadrangular, or what you like. This *archē* is mobile. Water indeed moves; it is determinate and not eternal.

Diogenes held that the *archē* is air, which is rich and fecund: it engenders birds. And it shows itself plastic, taking any form it is given. But it is one, mobile, and not eternal.

Herakleitos and Hippasos have taken fire as the *archē* of all things, since it's the active element of all things. An *archē* indeed should be the source of the activity of things issued from it. As some say, fire is also fecund, since animals are born in warmth.

As for the earth, no one has made an *archē* of it except Xenophanes of Kolophon. As it is not fecund, no one has made an element of it. And he who is in possession of every virtue [the interlocutor here] remarks that earth is not signalled as an element by philosophers, since it isn't fecund. Indeed Hermes associates the idea of earth with that of the unimpregnated virgin.[10]



Anaximenes declares that *archē* of things, infinite and mobile, is air. He argues thus: air is the neighbour of the incorporeal and we enjoy its efflux. It must be infinite as it produces without losing anything.

Anaximandros says the *archē* is the Intermediary: that which denotes moist vapour and smoke; the moist vapour is intermediary between fire and earth; in brief it is the intermediate between the hot and the moist. Smoke is intermediate between hot and dry.

Let's come to the opinion of each ancient and see how he seeks to direct his teaching according to his viewpoint. Here and there an omission is to be found as the result of the complexity of the discourses.

And now let's recapitulate by groups and show how our philosophers, borrowing from those others their point of departure, have built up our Art of Nature.

Zosimos, crown of philosophers, whose language has the abundance of Ocean, the new Divine one, follows in general Melissos on the art and says that the art is one like God. That is what he sets out to Theosebeia in countless places, and what he says is true.

Here he repeats the advice which we saw Zosimos gives to his sister: words of pantheist quietism, which reflect the deep patience and acceptance of reality that has to go with the active quest into the principles of natural process. Taken together with the arguments of Zosimos, these statements of Olympiodoros bring out clearly the points where the alchemists differed from all other ancient thinkers. They alone combined an essentially materialist outlook with a deep faith in the creative force, the formative pattern, working out in natural process, of which they saw man a part—and then went on to seek in a laboratory, in scientific experiment, for the precise ways in which the force, the living pattern, expressed itself. The fantasy-aspects of their thought cannot detract from the essential drive and purpose in their work, cannot obscure the great new synthesis at which they were arriving. The early Stoics and Epikoureans were inspired by something of the same sort of pantheist materialism, but they could not make the decisive step from trying to evolve the laws of life and matter out of their minds alone, the step into active experimental verification.

He exhorts us to seek our refuge in the one God. He speaks thus to the woman philosopher. Remain seated at your hearth, recognising that there is one god and one art. Do not agitate yourself this way and that in seeking for another God. God himself will come to you, he who is everywhere and who is not confined in a lowermost space like the *daimon*. Motionless of body, immobilise also your passions. And

thus, having corrected yourself by your own action, summon the deity and it will come truly to you, it which is everywhere. And when you have recognised yourself, then you'll recognise also him who is really God. Operating in this way, you'll obtain the genuine and natural tinctures, spitting on matter.

Similarly Chymes follows Parmenides and declares: One is All, by it All is, for if it did not contain All, All would be Nothing.

The theologians speak on divine matters as the natural philosophers on matter.[11]

Agathodaimon, inclined towards Anaximenes, sees the absolute in air. Anaximandros said that this absolute was the intermediate which is moist vapour and smoke. For Agathodaimon it is altogether sublimated vapour [*aithale*, often used for mercury in a volatile state]. Zosimos and most of the others have followed this opinion, when they constructed the philosophy of our art.

Hermes also speaks of smoke in connection with magnesia. Separate them, he says, in front of the furnace. . . . The smoke of the magnesia being white, whitens bodies. Smoke is intermediate between hot and dry, and here is placed the sublimated vapour and that that results from it. Moist vapour is intermediate between the hot and the moist; it denoted the sublimated moist vapours, those that alembics and their like distil.

As well as Hermes, Agathodaimon, and Zosimos, he names Maria the Jewess and Synesios. Though he refers to the authority of the Bible, which he seems to know very little, he has nothing noticeably Christian about his work, whereas he refers to the oracles of Apollo and those of the lesser *daimones*, invokes the Muses, and mentions the inscriptions in the temple of Isis. The Tomb of Osiris is his image of alchemy. He seems then to be at heart a pagan, cherishing the Egyptian tradition. He repeats the old tale of gold being engendered in the land of Ethiopia. "There a kind of ant extracts the gold and brings it up to the daylight and delights in it."[12] He cites the Ptolemaic libraries and uses Egyptian names for months, Mecheir and Mesore, which he relates to the four-month systems of summer and winter. He also repeats Zosimos on the role of Egyptian kings.[13]

He is still interested in practical work. He speaks of maceration, washing, roasting of minerals, and distinguishes volatile and fixed bodies:

The ancients admit three tinctures. The first is that which promptly disappears [volatilises], like sulphur and arsenic [not in the literal sense]. The second is that which fades out slowly, like sulphurous



materials. The third, that which does not fade at all: these are the metals, the stones, and the earth. The first tincture, made with arsenic, tints copper with white. Arsenic is a kind of sulphur that quickly volatilises; all that is like arsenic grows volatile through fire and is called sulphurous matter.[14]

He adds, "Mercury whitens all, draws out the souls of all, changes colour, and survives."

Olympiodoros is intelligent, but lacks the fervour of Maria and Zosimos. The growth of Christianity in the 4th and 5th century led to considerable disorders and confusions. Many philosophers were murdered. We saw how Hypatia fell early a victim to the monks. Alchemy, with its deep pagan roots visible in Zosimos and Olympiodoros, must have been highly suspect, and many of its practitioners must have suffered death or persecution. The atmosphere of the period is powerfully brought out in an account written in Boharean, with the inscription, *Enkomion* [*panegyric*] *written by our Patriarch, our Holy Archbishop of Alexandreia, Saint Dioskoros*. (Dioskoros we have met in relation with Synesios as the name of a priest of Sarapis. In a demotic spell-book we find it cited as a name of power, "Pronounce this name on the prow of a boat when it is going to sink to the bottom, and because of the names of Dioskoros which are there, it will be saved.")[15] There was an Egyptian martyr Dioskoros, commemorated on 18 May; another killed at Alexandreia under Decius and commemorated on 14 December: the Patriarch was dated 454 and commemorated on both 4 September and 14 October.[16]

To the west of the water there was a town where dwelt the servants of the idol named Kothos. The idol was set up in the niche of a house, and when they crossed the doorway of the house, they bowed their heads before it and worshipped it.

The town's priests arrived and told their Father all that the pagans did to them: that they tried to catch little Christian children as sacrifices for their god Kothos; they laid snares for them, and when they'd got once hold of them, they maltreated them, they sought out Christian children to sacrifice on the altar of their gods. Also, when caught, jailed, and interrogated, they had confessed without being put to the torture: "Yes, we make little Christian children come, we lure them with gifts of bits of bread and a handful of food, and then we shut them up in hidden places so that no one outside can hear their voices. Then we kill them, we pour their blood on the altar, we take their gut and string it like cords on our guitars, and we play music in honour

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of our gods. We burn their bodies and spread the ashes on places where we know treasures are buried, and we take up as much of them as we wish."

However the arrested persons have had recourse to ways of corruption and been saved, because the chiefs of this district are greedy for money.

68. The Alchemical Assumption (from *The Rosary*)

There was, of course, no human sacrifice in Egypt, and it is more than unlikely that the pagans would have reverted to such practices when they were under special scrutiny and attack. The Christians themselves had earlier been accused of cannibalism and incest; and they later were to accuse Jews of the very same villainies as they now laid at the doors of the pagans.

When the holy bishop, the Apa Makar, heard this from his priests, he rose and went with them. We set out with him, I and two men of high rank; and two priests went with us. When we had traversed some five miles on the lower part of their territory, we saw their temple. My father went that way, but the two priests cried, "Father, let's go away so that they won't kill us."

He replied, "As our saviour lives, even if they kill me, I won't give way till I enter here." And he went to the temple-door.

Then the demon who dwelt by the door and the idol Kothos cried



out, "Go and hunt Makarios out of Tkou." Fear gripped us when we heard his voice. If the fear had held us a moment more, we'd have gone away, we'd not have returned there, nor should we have come back to our homes to see you.

When the pagan priests heard that, they came out of the door with arms, javelins and axes in their hands; and the women climbed on the temple-roof to throw stones at us. They shouted at Makarios, "Makarios, you are the criminal of Tkou. Why have you come and what do you want here? Our gods have warned us of your hate. Go back to your own place. What have you to do with us?"

The saint replied, "If I have nothing to do with you, what have you to do with the children of Christians that you sacrifice to the idols?"

They said, "It isn't true."

The saint then said, "Won't you let me enter and see the temple?"

They answered, "Come in."

However the two priests were scared and didn't enter.

Then twenty men rose up, closed the doors behind us, and prepared to kill us. We were only four, and they shouted at us, "Your life is finished today. The moment of your death is upon you."

At once they threw themselves on my Father, seized him first as a spotless lamb, and then us three. The pagans rose up and set us as offerings on the altar of their god Kothos, and the women rejoiced, crying, "Let us glorify our god today with these Christian criminals."

However the chief among them said, "We must refer the matter to our highpriest before killing them and we must call him here about the sacrifice to our god Kothos."

The others agreed with him. Homeros was the name of their high-priest. They sent a man out to find him. I said to my Father, "You are seated here without praying for our preservation. Come, the hour of our death is here."

My Father answered, "Don't be afraid, my son Tonoution. Christ will aid us."

And at those very words the holy Apa Besa knocked on the door; and as no one answered, he cried out, "Great all-powerful God who drew Peter out of prison, unfettering his hands and feet and making the door open before him, so that the guards didn't hold him back and the soldiers watching at the door were asleep and the angel of the Lord followed and led him out by the door of iron giving access to the town—make this temple open of its own accord." At that instant the temple-door opened and the holy saint Besa entered with monks to the number of forty.

When they entered, the pagans were scared. They were like soulless stones. We were at once freed from our bonds and the holy Apa Besa said to my Father, "Let us both get to work. You make a fire and I'll pray—or you pray and I'll make a fire."

My Father replied, "No, let us stand up together, one by the other, let's pray together that fire descends and burns this temple."

And standing there the two prayed until a voice from on high was heard, "Save yourselves by the temple-door."

Before we had even turned our heads, a great wall of fire surrounded the whole temple and its walls crumbled away and the fire consumed it all right down to the foundations. My Father cursed the temple, saying, "Let no tree yielding shade ever grow in this place. Let it become the dwelling-place of wildbeasts and reptiles of the earth."

Then a foul demon entered flying into a man, who ran off into the town, howling, "Let all the pagans flee. Besa and Makarios of Tku are there."

My Father then met Homeros, their leading man, on the road. He was the highpriest and my Father knew in his heart that he was the chief they'd sent for. He said, "When they prepared to slit our throats and kill us, why didn't you come to glorify your god Kothos?"

He answered, "You're not a fit sacrifice for our god, you're an old man."

Then my Father made a sign to the Brethren. "Seize and bind him."

And this noisome priest cried, "Great god Kothos, supreme sovereign of the airs, brother of Apollo, save me. I'm your highpriest."

My Father called to him, "I'm going to burn you alive, you and your god Kothos."

Then they went on their way, they went into the town and a crowd of orthodox followed them. He bade them make a fire. They threw Homeros in and burned him up together with the idols found in his house. Several surviving pagans accepted baptism and became Christians. The others refused, took their belongings and threw them in the river and the lakes, then went off with their idols into the desert. We counted the idols destroyed on this occasion and found their number to be 306. In the houses of the fugitives the Christians were established.

Apart from the miracle of fire, this account may be taken as a realistic version of what happened again and again. Some Christians forced their way into a temple, were resisted, called up the monks, and proceeded to smash the temples and murder the pagans. A character like Homeros might well have been a learned man, a philosopher, an alchemist.

Alchemy tended to shift more to the north. We saw in Chapter III how Aeineias of Gaza in the later 5th century knew a group of alchemist artisans. The art developed in Syria, with part of its writings in Aramaic, and it is significant that Greek Fire was effectively worked out in this area.



The Greek alchemists who carried on writing dealt now in compiling extracts from the masters, each a short chapter; the comprehensive view, which sought to link theory and practice, was fading out. Soon even the anthologies began to break up, with loss of the names that guaranteed the worth of a recipe. The manuscript of St Mark, the oldest we have, is fairly faithful, but has suffered many mishaps, leaves in the wrong places and gaps in the texts. The next in age, Paris 2325, is purely practical and mentions as authors only Demokritos, Synesios, Stephanos—whereas St Mark still kept a considerable place for theory. In Paris 2327 the many errors make it seem the work, not so much of a professional scribe, as of a practising alchemist, who paid attention to the recipes but was not much interested in the general statements. We can perhaps make out three types of manuscript that have come down: (a) texts like that of St Mark which have already had a long development behind them, but maintain a strong theoretical interest and appear as a collection of doctrinal works with names of authors attached—the items set out in an order which has its arbitrary aspect but which still does not suffer unduly from the predilections of the compiler; (b) practical works mostly of anonymous recipes, with the signed sections kept down to a minimum; (c) composite collections which include doctrinal works but without any system and with an aimless irruption of recipes—the copyist seems to put in anything he thinks relevant to the alchemic art.[17]

In due time alchemy became a pursuit also of Christians. We have an anonymous writer called The Christian, who seems a Byzantine monk of the early 6th century, acquainted with Gnosticism. He speaks of the unquenchable source of Water in the midst of Paradise. "The divine oracle says: Let us make man . . . and make male and female." He has learning and mentions the shadow of the cone of the earth which reaches to the sphere of Mercury; cites, in the usual eclectic way, Aratos and Hesiod, the Bible and Hermes, as well as Agathodaimon, Demokritos, Petesis, Zosimos; sets out in philosophic language the varieties of gold-making according to kind and species; reproduces the geometric concept of the elements from the Pythagoreans and Platonists; only his first paragraph is original. Near the end of his treatise he abridges Zosimos' definition: "Such is the image of the world, famed in ancient writings, the mystic science of Egyptian hierograms." Then he turns to the substantial natures,

showing a gnostic and theological bent of mind.[18] His diction is like that of Olympiodoros.

He dedicated his work to Sergios, who may be Sergios Resainensis. The latter lived in Alexandreia in the early 6th century and translated into Syrian the Greek medical and philosophical writers.

With Stephanos we reach the culmination of the rhetorical tradition, in which both theory and practice are exploited for the outpouring of flowery and exalted encomia of the sacred art. He was a philosopher and public professor at Alexandreia under Heraklios, 610–41. He lectured on Plato and Aristotle, on geometry, arithmetic, astronomy, music—leaving a commentary on Aristotle and an astronomical work, *Apotelesmatikē Pragmateia*, as well as his alchemic treatise, which consists of nine *Praxeis* or Lessons, of which the last is dedicated to Heraklios in extravagantly adulatory terms. Attempts have been made to argue that the treatise is of the 9th century and not by Stephanos; that public lectures on alchemy were against the law. But this latter point falls down. Alchemy had now emerged into the open—at least as a recognised art, even if the operators still carried on a secret tradition. True, the style of the treatise is different from that of Stephanos' other works, but it is free from the barbarisms that crop up in the later alchemic texts, and there are many references to mathematics, astronomy and music—suggesting the wide interests of the philosopher, who might well feel called on to use a specific kind of idiom, declamatory and excited, for expounding the mysterious art. Further, the treatise was known to the Anonymous Philosopher, who does not seem as late as the 9th century, and is cited in the *Kitab* (probably 850).[19]

Stephanos has read widely and grasped the main ideas of alchemy; but he quite lacks the incisive grip of Zosimos. A Christian mystic with a confused mixture of idealist ideas drawn from any school, Pythagorean or Platonist, he wants to feel stirred and uplifted by suggestive enigmatic images or doctrines. In the last resort the ideas are playthings, instruments for his edification and for the display of his rhetorical and rhapsodical powers before duly dazzled audiences. We may take his first lecture as a sample.[20]

*Stephanos of Alexandreia the Universal Philosopher and Teacher of the Great and Sacred Art of Goldmaking. Lecture I with God's Help.*

First we praise God the cause of all good things and the king of all, and his only-begotten Son resplendent before the ages with the Holy



Pneuma, and we earnestly beseech for ourselves the illumination of the knowledge of him. Next we shall begin by gathering the fairest fruits of the work undertaken, of this very Treatise, and we trust that we shall track down the truth. Our problem now must be to proceed from a true theory of nature.

O nature superior to nature conquering the natures. O nature become superior to itself, well-regulated, transcending and surpassing the natures. O nature one and the same yielding and fulfilling the All. O union completed and separation united O identical and not alien nature providing the All out of itself O matter immaterial holding matter fast O nature conquering and rejoicing in nature O heavenly nature making the pneumatic existence shine forth O bodiless body making the bodies bodiless O course of the moon illuminating the whole order of the universe O most generic species and some specific genus O nature truly superior to nature conquering the natures—tell what sort of nature you are.

Thus he expands the triadic formula of Ostanes, but in a way which merely inflates and diffuses it, not a way that applies or extends its meaning. He now launches into a further ecstatic series of synonyms for the art of the Stone, the Egg, the Water:

That which in a family sort of way [*oikeios*] received itself from itself again, indeed that which yields sulphur without fire and has the fire-resisting power, the archetype of many names and name of many forms, the experienced nature and the unfolding, the many-coloured painted rainbow, that which discloses from itself the All, O nature itself and displaying its nature from no other nature O like bringing to light from its like a thing of like nature.

O sea becoming as the ocean drawing up as vapour its many-coloured pearls. O conjunction of the *tertasomia* [four-body system] adorned upon the surface O inscription of the threefold triad and perfection of the universal seal, body of magnesia by which the whole mystery is brought about.

O golden-roofed stream of heaven and silver-crested spirit sent forth from the sea O you that have the silverbreasted robe and provide the liquid golden curls O fair exercise of the wisest intellects O wise all-creative power of most holy men O sea inscrutible to uninitiated men O ignorance seized-on beforehand by vainglorious men O smoky kindling of disdainful mankind O uncovered light of pious men O countenance contemplated by virtuous men O sweetly-breathing flower of practical philosophers.[21]

O perfect preparation of a single species O work of wisdom having a beauty composed of intellect O you flashing such a beam from a single being upon all O moon drawing a light from the light of the

sun O single nature itself and no other nature, rejoicing and rejoiced over, mastering and mastered, saved and saviour, what have you in common with the host of material things since one thing is natural and is a single nature conquering the All?

Of what kind are you, tell me of what kind?

*Genos*, genus and *eidos*, species, seem to have a specific meaning. The genera seem to be metals which own a proper *physis*, a term here referring to an object in which the four elements combine to characterise it and give rise to its properties. The species were such substances as stones, salts, and so on, which were not counted as bodies with such a *physis*. The system was worked out by the Anon in the 8th century, but his explanation of the terms does not quite accord with earlier usages. Stephanos' playing on the concepts of body and spirit, material and immaterial, is based on the fundamental alchemic use of these terms: the notion that chemical reagents destroyed the body (metal) and released the soul, but that the dead metal (some compound in fact) could be revived—turned again into a metal.[22] But he is as much concerned with the further series of ideas suggested. Thus, he is certainly thinking of the endless arguments on *physis* in theological controversies, on the relation of the human and divine natures of Christ.

I dedicate this great gift to you of good understanding, to you clothed with virtue, adorned with respect to theoretical practice and settled in practical theory. Of what kind? Show us, you who have indicated beforehand that we should have such a gift. I shall declare, and not hide, of what nature. I confess the grace of the giving of light from above, which is given to us by the lights of the Father. Hear as intelligences like angels. Put away the material theory so that you may be considered worthy to see the hidden mystery with your intellectual eyes.

For there is need of a single natural [thing] and of one nature conquering the All. Of such a kind, now clearly to be told you, that the nature rejoices in the nature and the nature masters the nature and the natures conquers the nature. For it rejoices on account of the nature being its own, and it masters it because it has kinship with it, and, superior to nature, it conquers the nature when the corporeal operation of the process fulfils the initiation into the mysteries.

For when the incorruptible body is released by death and when it transforms the fulfilment which has become spiritual, then, superior to nature, it is like a marvellous spirit. When it masters the body that it moves, then it rejoices as if over its own habitation, then it conquers



that which in disembodied fashion haunts the Whole which is begotten of the Whole, that is admirable above nature.

What I say to you is the comprehensive magnesia.

After he has worn thin the concrete formula by this tireless and weakening repetition, his conclusion about magnesia comes as an anticlimax. Magnesia is often mentioned by alchemists, but none of the substances they mention is more obscure. Plinius describes five kinds, which seem to be magnetic oxide of iron. But the alchemic material, which can be reduced to a metal like *molybdochalkos* (lead-bronze), was perhaps a lead or antimony-copper alloy. It was to some extent volatilised by heat as we hear of "mercury from magnesia". The body obtained from its reduction was thought to be equivalent to the tetrasomia or alloy of the four base metals. Here Stephanos seems to take it as the basic underlying substance of the universe. He raises the question whether the work of transmutation could be done by one *eidos* (species) or by several *eidē*. There was disagreement on this point among alchemists. The fragment *On the Assembly of the Philosophers*, attributed to The Philosopher (Demokritos), sets out the view that a single species was to be used; but the contrary view is expressed in *That the Species is Compound and not Single and What is its Management*.[23]

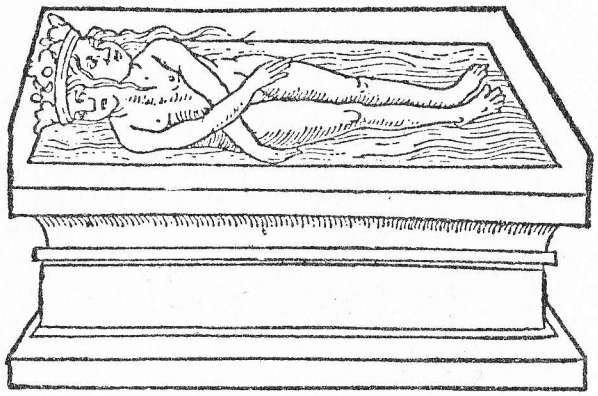
Who will not wonder at the coral-of-gold perfected from you. From you is the whole mystery brought to perfection, you alone will have no fear of the knowledge of the same, on you will be spread the radiant eastern cloud. You will bear in yourself as a guest the multiform images of Aphrodite, the cupbearer again serving the fire-throwing bearer of coals—then carrying such a brightness from afar, you veil the same in bridal fashion, you receive the undefiled mystery of nature.

Whereas Kleopatra spoke openly of the processes of coition, gestation and birth, Stephanos describes coition in a hidden allusive way, using the pretext of the bridal veil. The cupbearer could be either Ganymedes or Hebe; the fire-thrower is Zeus who hurls the lightnings. As sexual intercourse is suggested, the cup-bearer is probably Ganymedes, who would suit alchemic imagery as being snatched up from below to the upper regions.[24]

I will show you as well the lustre of your nature, I will begin to indicate your multiform images. For then he who intelligently interweaves you that have fire without you, rekindles the fiery thing. Looking on

your many-coloured visions, I'll be impotent as I circle round its beauties. Your radiant pearl blinds the sight of my eye. Your *phengites* [moonstone] rekindling astounds all my vision, your shining radiance gladdens all my heart O nature truly superior to nature, conquering the natures.

You the whole are the one nature. The same by which the whole becomes the work. For by an odd number your all-cosmos is systematised. Then you will understand in what respects you will look ahead, then you'll find out in what places will be your ambit, then you'll stop the struggles of sedition, then you'll disclose the kingly purple which also you'll bring with your Maiden's aid.[25]



69. The alchemical death of the hermaphrodite (from *The Rosary*)

The struggles, *agones*, of sedition, *stasis*, with the following advent of the royal purple, seem to refer to the conditions before Heraklios and to his accession. In the preceding reign of Phokas, selected by the army, there had been a confused popular triumph; bloody clashes went on all over the east between the Blues and the Greens (the circus-factions organised as something like political parties), between the King's Men (Melkites in Egypt) and the masses with their various economic and political grievances. Heraklios, son of an exarch, was finally sent by the magnates of Africa to overthrow Phokas and restore what they considered as order. As he was a strong supporter of Orthodoxy, the Maiden who helps to bring the purple was perhaps the Virgin Mary. He indeed had the role of Defender of the Faith forced on him in wars against the Persians, a crusade to regain a piece of the True Cross which was said to have been carried off from Jerusalem



The piece was won back; the Persian holy-city, considered the birthplace of Zoroaster, was burned down; and the statue of the Persian king Chosroes (round which hovered winged images of sun, moon and stars) in the temple of the Sun was smashed.

Then there will be, not the recent labour, but a couch canopied with gold; not a multiform ability, but an allwise sagacity; not a deprivation of virtuous men, but a fruition of perfect men. For such is the measure of it to be found in the Odd Number.

The odd number is the natural monad, about which Stephanos elaborates in the opening of his second lecture. We need not cite the rest of the first one, since he now divagates into pious remarks about "all-ruling God" and links the divine water of alchemy with the grace of Jesus Christ that enables men "to gush forth rivers of living water". He cries, "Why should we marvel at the species Chrysokorallos? We should wonder rather at the infinite Beauty." It is an example of his distance from Zosimos or Olympiodoros that when he goes on to discuss the monad he says that "it is so called from its remaining immutable and unmoved. For it displays a circular and spherical contemplation of numbers like itself." This Phytagorean mysticism of number is as far as could be from the alchemic acceptance of the world of movement and change as the real world. Stephanos shows the decadence of the tradition in almost every respect.

Indeed a neo-Pythagorean mysticism keeps on blurring out the alchemic insights which Stephanos glibly repeats and elaborates. His second lecture has many Pythagorean comments on numbers, and he declares:

For they who pluck the strings say that Orpheus made melody with rhythmical sounds so that the symphony should re-echo the co-ordinated movement of the elements and the sounding melody should be harmoniously perfected. For from the one instrument the whole composition takes its origin, hence also the organisation of the articulate body is ordered in the bones and joints and parts and nerves, and, by the plectrum of the air, given forth in the fashion of a moving instrument, a voice is sent forth to the One which is joined to its essence and which conquers and organises it by its own life: the very mode and blending of the air.

For of two extreme qualities there is found one mediator and conciliator which preserves the qualities of both on account of its resemblance and close kinship to them.

There we see a deep sense of inner organic relations, such as we find in Galen, but also a collapse of the true alchemic doctrine of the fusion of opposites. Stephanos returns to the Pythagorean doctrine of a reconciliation of opposites, which Aristotle also developed in his own way: the middle-class idealisation of a way of life that kept down and controlled the unruly opposites of the aristocracy and the plebeians. Stephanos uses this concept, which ultimately implies the arrest of development, not its driving-on to the crucial points of change, in the key of his exposition of the emperor Heraklios as ending the "struggles of sedition". Alchemy has become respectable and accommodated itself to the world of power.

The same doctrine of arrest, which abandons the view of the world as ceaseless movement and change, appears in Stephanos' formulation at the outset of the third lecture:

> How the [world] is fashioned and how the divine parts of it, being well purified, fly upwards, which, being level, draw up after them the more level parts. For the method mystical chemistry consists of symbols [here appears the sign for *ouranos*, heaven, and the zodiacal Scales], and what is required is operated by method. So also the bodies, made metallic, and being changed from the contrary nature, become by certain method level and aitherial.

The term *epipedos*, level or flat, suggests the arrival at a space where the process ceases to operate, an etherial level outside the universe of change. The pantheist concept of Zosimos excludes the possibility of such a conclusion. The "change from the contrary" has become here in Stephanos a change to a state where contraries do not function.

Treatises were attributed to the emperors Heraklios and Justinian. A part of the work under the latter's name survives; Heraklios was brought in because of his patronage of alchemy. The Anonymous is a sciolast, later than Stephanos, whom he cites. He writes on gold-making on the divine water, gives the first list of oecumenical philosophers; and feels nothing odd in mixing their names with the Christian Trinity and Biblical references.[26] Then come some late unimportant compilers, Pappos (probably of the 7th-8th centuries; Salmanas, who seems a century or two later by his style; Kosmas, round about 1000, who uses barbarous terms like *salonitron*, *tzaparikon*; Michael Psellos (1018–78), the famous literary man, who composed two minor and unoriginal works,



which however helped to spread alchemic ideas in the West; Nikephoros Blemmydes of the 13th century, an inhabitant of Byzantion, who still looked to Demokritos and his school; and nameless writers like the man who compiled a Lexikon of Gold-making, in which magnesia is explained in three quite different ways.[27]

We spoke above of the movement of serious alchemic work to the Syrian area. From the mid-5th century Nestorian and Monophysite heretics in exile had been carrying Greek ideas of medicine, astronomy, alchemy, throughout Syria and Persia. The reign of Heraklios saw the first expansion of the Arabs, who were soon to take over alchemic experimental work.

There are also four poems on alchemic themes, all written in iambic lines of twelve syllables, with caesura usually falling after the seventh syllable. Each poem has the name of a different author attached to it—Heliodoros, Theophrastos, Hierotheos, Archelaos—but the style and treatment are so similar throughout that there seems no doubt they are all the work of a single poet, who had soaked himself in the writings of Stephanos. There is nothing new in the poems, but in many passages the ideas and images of Stephanos are ingeniously expanded. The Christian idiom grows

70. The winged hermaphrodite symbolising the red stone (from *The Rosary*)

stronger as the basis in laboratory-work grows weaker and the whole thing is conceived almost entirely as satisfying material for an allegory. The similarity of sound in *baptein*, to dip or tinge, and *baptizein*, to baptise, is felt to be significant; allusions to the New Testament grow more frequent; and mystical extravagances take over the place held by symbolic correspondences. Imagery of death and resurrection are dwelt on for their own sake. We saw above Theophrastos on the Ouroboros; as a further example of the style we may take a passage from the poem of Archelaos:

> Then longingly she cries at what she sees.
> Freed from her body, how may she again,
> she wonders, there remain, now spirit-like.
> So modified in shape and form is she
> no trace is left in her of darkening mist,
> no trace. Instead, she wears a splendour now,
> changing her murk for white and glistening light.
> Her former instrument she views out-stretched,
> struck motionless, with loss of speech and life,
> awaiting resurrection from the tomb.
> The prey of many torments and assaults,
> she comes nearby with bright and joyous looks,
> and thus her body's prostrate form addresses
> with tranquil voice—with signs and not with words.
> "Come out! Rise up from Hades' deadly pit!
> Cast from yourself the darkness and the gloom!
> Wrench off the shroud of death again, the clothes
> that marked you, up till now, as one condemned,
> in which so many burnings were endured
> that you might show yourself in all refined,
> transformed like spirit and revivified
> by her the Soul who lately uprose from you
> and who will quickly live in you again
> when Spirit comes, a third, to crown the whole.
> You were a corpse before, a thing corrupted,
> and empty of life you dwelt inside the tomb,
> empty of form, of breath, quite lacking grace.
> Defeated in battle now you avoid the strife,
> in closely contested conflict you've been beaten
> and seem a fugitive to one and all.
> Conquered within, you may no longer stay
> to ward off darts that assail you from outside.
> By swimming away on the element of water
> you do not wait till the woman's joined with you



> in marriage as you desired. You do not check
> the clash of female conflict, but your bloom
> is ravaged by her power. Thick darkness then
> hides all your shining beauty in a tomb:
> breathless and lifeless, a corpse wrapt in a shroud,
> you expose the face alone of all your frame.
> Cast out and naked you seem to all beholders,
> waiting without a voice for life to come,
> saying by signs: Where is that living soul
> which left me once and took its life away?
> Unite us, make me brighten with her again,
> my likeness now is all defiled with murk,
> immerse my form and wipe it off in cleanness
> that I may be a shining habitation
> made fair and glorious, O Soul, for you.
> Bearing no blackness and no stain of filth
> but rather like a strong and powerful light
> pouring its rays out, in a flawless splendour,
> so that a victor's crown may be deserved:
> reconquering the one who struggled with me
> in close combat, I'll show a handsome home,
> a worthy dwelling-place for both my guests,
> the Spirit and the purifying Soul."
> These Three united in a steady bond
> of firm affection and of constant love
> shall dwell together, truly unified,
> the Body, Soul and Spirit: not subdued
> by fellowship but rather beautified.
> They fight the fire with light and cripple fire
> by tingeing at their will. They feel no fear,
> a stronghold triply fortified and stable,
> to one another intimately mated
> in fourfold manner by the elements.
> With penetration they abide. They tinge
> and give to bodies every kind of colour.[28]

There we must leave Graeco-Roman alchemy. The foundations in method and theory had been laid. The Arabs were to pick the art up and hand it on to the West. No new ideas emerged; but in the application many new incidental discoveries were made, and the tensions between the practical side and the insufficient theory were to build up till modern chemistry began to develop with Boyle and others in the 17th century. All that, however, is not part of our story.

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# 18

# Conclusions

We have now viewed the birth of this strange science—strange in itself and strange in its whole way of development. It emerges and grows during its vital formative period in secrecy and does its utmost to remain secret and to avoid connections with any social or economic forces in its world, despite its strong links with many technological processes. The secrecy, we may say, was not altogether its own choosing. Through its connection with "gold-making" it was liable to bring the whole weight of the authorities down upon it—though its true exponents were not at all concerned with making gold for their own enrichment. They sought the clue to the nature of process, the nature of life itself, and nothing less. But, reinforced by the various cautions, there was the deep bias towards secrecy brought about by the two main bodies from whom the whole impetus towards the new science came: craft-fraternities and mystery-groups. Each of these in its own way had a strong tradition of keeping secret its essential lores or discoveries. The alchemist thus from the outset felt bound by a passionate devotion to his art, which he opposed to the world of power, money, accepted usages. He had staked everything on his personal quest into the unknown, and the demands of the world were felt only as shackles, corruptions, diversions, distortions. His lonely dedication became the pledge of his worth, of his right to the quest and its revelations. In all this he had affinities with the devotees of the various dissident religious groups, including early Christianity, but he also has his profound difference from those groups. In his pantheist-materialist way he was concerned with actual process, with the structure and laws of the nodal points in material change.

In a general way the notion of scientific research as somehow identical with mystery-initiation was widespread. Dion Chrysostom remarked:



> Here is a correct enough comparison. Suppose you invited a Greek or a Barbarian and took him into a mystery-temple of a prodigious beauty and grandeur. He would see there all sorts of secret visions, he would hear all sorts of mysterious voices. Darkness and light would alternate in his eyes, not to mention an infinity of other spectacles. Besides, as is usually done in the ceremony of Enthronement, after installing the initiate on a throne, the initiators would dance in a choir around him. Is it credible that such a man would feel no emotion in his soul and that he would not grasp the idea that all that was accomplished in virtue of a design and of preparation full of wisdom? . . .

How is it different, he asks, in the Cosmos which is also a beautiful Temple? Seneca even more directly links the mysteries of Nature with those of Eleusis:

> There are mysteries where the initiation is not completed in one day. Eleusis reserves secrets that it reveals only to those who return to see her. Nature too does not reveal all her mysteries at once. We think we are initiates when we are still only in the vestibule. These arcana do not unveil themselves in a hurry, nor to all men. They have been withdrawn to the depths of the sanctuary, well apart in an inner chapel. Our century has seen a part of them; the age to follow us will make out others. When will they come in their entirety to our knowledge? Great discoveries are slow, especially when effort languishes.[1]

The alchemist, for the various reasons we have noted, drew the logical conclusions: that the scientific mysteries should be revealed only to the initiates. In so doing he was making the best of a bad job: for certainly in the Ptolemaic and Roman periods any attempt to practise and to teach in public would have meant prosecution for counterfeiting and for meddling in matters strictly reserved for the State. For quite different reasons the State and the alchemist were concerned with gold, considered the purest of metals. The State, because of its worldly economic value; the alchemist because of its unworldly spiritual-and-scientific value as the supposed highest level of matter.

In our first chapter we sketched out the main attitudes, the underlying and unquestioned preconceptions, of the world from which the alchemist arose. Let us glance afresh at the limitations of the classical outlook. Aristotle's synthesis had been specially weak, almost blank, on mechanics, as men like Archimedes and Hipparchos could not but grow aware. The Greeks were able to deal only with combinations of forces or motions that were in

the same straight line or were parallel, as with levers. Without something like the calculus no notion of instantaneous velocity could be worked out; hence Aristotle's inability to deal effectively with planetary motion or free fall. In the Hellenistic age, Archimedes made the first step towards the infinitesimal calculus and Hipparchos was feeling his way towards the modern concept of momentum; but these explorations could not be carried further in their society. The Aristotelean categories of motion held the dominant position, and were inherited by the medieval world. In the sublunar sphere all natural motion was rectangular, light things rising from the earth's centre, heavy things falling down to it. As that centre was a fixed point, there was no problem about defining up and down, lightness or heaviness.[2] All deviations from the rectilinear were thus seen as the result of violent motion, with some force deflecting the light or heavy body from its natural straight line. In the celestial spheres above the moon, however, motion was natural, in a circle, as on earth rest was natural, violated only by the application of force. Aristotle did not state the proposition that the application of a constant force imparts a constant velocity to a body, but it was implied in all pre-Galilean mechanics.

Special cases where the Aristotelean system did not apply kept coming up, but it was not till the advent of projectiles (*i.e.* gunpowder and its blast-power) that such a case proved so difficult as to break the whole system down. Already, however, among the Greeks there had been much strain on Aristotle's two main dynamical principles: that movement required a continuous efficient cause to keep it going, and that space had an organised qualitative structure with different natural directions for different substances.[3] As a result, the geometrical space-systems ended by having so little relation to the accepted system of dynamics that a distinction came to be drawn between mathematical and physical theories, with two criteria (stated by Ptolemaios) for choosing which was to be used: the one that saved the phenomena most accurately and with the smallest number of necessary assumptions. This distinction was taken up afresh in the West in the 12th–13th centuries.

Gunpowder, ballistics and projectiles were the force that blew up the ancient systems inherited by the medieval world; but the discovery and use of gunpowder did not arise technologically in a social vacuum. That discovery and its concomitant problems



were the expression of the new bourgeois forces slowly breaking through the old balances: the interlocked feudal system of hierarchies which had replaced the ancient system of freeman and slave interlocked in what was more or less a technological impasse. For the systems which fundamentally resisted any deep-going change, the world existed in a condition of "natural rest", which was only disturbed by directly interfering (and in their sense, unnatural) forces. The Aristotelean tradition held that the interfering forces resided in the medium (air, water, etc.) where the motion took place. The medium did not move but was charged with the capability of moving; it resisted movement but was locally and temporarily defeated by the application of a constant force, though it still expressed its nature by limiting the attainable velocity; it thus had a contradictory effect, reducing a body to rest, yet protracting movement after the force's effects had ended.

A little thought will bring out the way in which the Aristotelean scheme of things ideally represented the problems of movement and change in a slave-society. And it could in turn become the expression of a feudal society, which, though discarding slavery, reposed on an equally stubborn and inert basis, serfdom.

However, in late antiquity the glimmerings of a different system appeared in a thinker like John Philoponos of Byzantion (6th century). Men began to argue that when a stone was thrown or slung, the efficient cause maintaining the velocity was an inner tendency imparted by the thrower to the stone. Behind the new conception there lay the considerable social changes which had gone on in the Byzantine world, the shaking of the ancient bases without the ability to break through into new forms, and so on—historical changes we cannot probe here, though we may note the accompanying growth of new projectile mechanisms culminating in Greek-Fire, the precursor of gunpowder and cannon. Philoponos' notion of the Impetus reached the West in the 14th century through men like Jean Buridan, and eventually, linked with the technological advances of the 15th–16th centuries (especially the complex of physical, mechanical, chemical developments centred on gunpowder), issued in Galilean mechanics and Newtonian physics. "The classical scientists had studied bodies at rest, or bodies acting in each other with relatively steady forces. The new world was to consider the problem of bodies in violent motion, and on this basis was to found a new and much more comprehensive mechanics."[4]

There then is the dilemma of ancient science considered from a new angle. We have seen that the Aristotelean systems did not carry on without various challenges, of which the main one was the Stoic concept of *pneuma* as a tensional force pervading the whole universe. But this concept, however fruitful in a general way, could not develop effectively a system of physics to supplant the Aristotelean. Similarly Plato's ideas of symmetry-asymmetry as the source of movement or development, and his triadic schemes of vital structure, could not do other than impact as general ideas on a stubborn world of "natural rest". Galen had a remarkable sense of growth as a continual reassertion of structure in new conditions of tension. "This nature which shapes and gradually adds to the parts is most certainly extended throughout their whole substance. Yes, indeed, she shapes and nourishes and increases them through and through, not on the outside only."[5] But he saw this process only in terms of the individual (isolated) organism and thus could not apply the symmetry-asymmetry principle in terms of fused inner-and-outer tensions at work.

Where, then, do our alchemists come in? They took over many ideas from Aristotle about the elements, metals and the like, but in effect they brushed his physics aside. They accepted the Stoic idea of a unitary process and proceeded to see where it led them, not merely as a general or a moral idea, but as a guide to scientific action. Thus they were able to apply the Platonic triads in a concrete way and to discard the whole notion of natural rest. They attained at least a partial consciousness of the revolutionary step they had made, as we see from Zosimos' account of the unity of all processes, his insistence on the use of the triadic formula in a way that embraced theory and practice in a dynamic unity, and his rejection of both the empirical and the magical-mystical way. We see it again in Olympiodoros' rejection of the notion of the absolute, of a changeless reality. But these men could not possibly have comprehended anything like all the implications. For one thing they were not interested in the speculations that finally led to the impetus theory. They were not interested in the mechanical aspects of the world at all.[6]

In this fact lay both their weakness and their strength. They contributed nothing to the line of ideas which led through Philoponos into Buridan and Galileo; and on the whole they would have considered that this was an incorrect line for science to take. Clearly they could not have denied the new grasp of phenomena



that was thereby made possible, but they would have argued that the grasp had been obtained at too great a cost, or that the results it brought had been misapplied. The consequences, in the alchemic view, were to divorce man from nature, to give mechanistic aspects a vastly undue importance in the scheme of things, and to lose sight of the flashpoints of change or development.

What the alchemists took over from classical Greek thought was the concrete sense of the object, the concentration on its qualities; but they attempted at the same time to break through the limitations of this attitude, not by ignoring qualities and concerning themselves solely with the quantitative mechanics and dynamics of objects in interrelation, but by putting the objects into interaction with one another as units composed of qualities. Their problem was that they could not effectively explore and extend this method without quantitative systems to provide a secure basis for their experimentations; the only way historically open for the creation of those systems lay through Philoponos and Galileo. Men were not able, as they still are not able, to deal simultaneously with the abstract world of quantities and the concrete world of qualities.

History shows that the feasible way forward was through Philoponos; but that does not simply wipe out the alchemists as misguided enthusiasts. On the one hand there is the mere pragmatic defence of their work. However fantastic the theory, the work itself did draw attention to problems of chemistry. In its development or expansion over the centuries, especially through the Arabs and various western alchemists like Paracelsus, it made many incidental discoveries of great importance. And finally in the issues it raised in its declining years, in the transitional schools (such as that of the Phlogiston Theory) which it evoked, it led the way to chemistry on a quantitative basis—chemistry without the vision of unitary process and of nodal points of qualitative change. (Modern chemistry was not just alchemy without the nonsense; it was alchemy tamed, reduced wholly to a quantitative level, and thus giving up its ghost.)

On the other hand we can put up a defence that would have been more to the taste of the alchemists themselves. We can admit the weaknesses, the enormous scope of the aims and hopes in comparison with the technical resources on which they were to be realised. We can admit that without precise forms of control—those afforded by quantitative methods or checks, and by much

more effective apparatus—the art was doomed to go round for the most part in wasteful circles, unable to find firm ground on which to advance step by step. We can admit that fantasy and intuitive guesswork played an inordinate part in the art. And yet we can still hold that the alchemists were on the track of something that still eludes scientific method and inquiry. Something that is nowadays becoming more and more relevant to the scientific comprehension of reality. Just as thermodynamics in the 19th century brought physics back in some respect to underlying ideas that owned certain affinities with classical Greek ideas, so the advent of atomic physics and quantum mechanics brings science up against problems that remind us of both stoic field-theory and alchemy. It might be argued that the unifying theses which are so badly needed by the physics of our day will turn out, when and if they are found, to be closer to Zosimos than to Galileo in some fundamental aspects.

The unity of human and natural process, as set out by the alchemists, may have many fantastic elements; yet it may very well hold an essential truth which was lost with the appearance of Galilean mechanics and its method of excessive abstraction. The reduction of the world to quantitative elements banishes man from the scene, for it banishes all concrete objects with their

71. Alchemical resurrection (from *The Rosary*)



essentially qualitative existence. Life becomes the ghost in the machine. True, the gap is partly bridged by biology and its connected disciplines; but in a world of thought dominated by quantitative mechanisms, biological issues can only be realised in limited aspects or through a distorting mirror. The problem posed by the alchemists, that of founding a truly human science, without the abstraction thrusting between man's senses and the external world, is still to be solved. In this sense the alchemists were not daydreamers of a confused moment of the past; they were the prophets of a future yet to be realised.

I have spoken of the final role played by alchemy in the transitional schools that lead up to the chemistry of Priestley, Lavoisier, Dalton. The role of alchemy in the 17th century still needs to be fully assessed. It is a noteworthy point that more alchemic books appeared in English between the years 1650–80 than in all the time before and after that period.[7] The effect on culture appears strongly in the poetry of the 17th century, in our so-called Metaphysical Poets. But the point I should like to make here is the way in which a new sort of attention was paid to *Colour* after the triumph of the new mechanics in Newton. The Romantic Movement was founded by the poetry of Thomson and Savage, in which appears *a new dynamic sense of colour, of light as a sort of formative principle*. These ideas were developed by the romantic poets, with special attention to the changes of light, colour and tone at morning and evening. Ann Radcliff called the dusk "the transforming hour"; and the way in which the poets used dusk-imagery to express the merging of vast elemental and human changes was in a pure alchemic idiom. In Smart's *Jubilate* the conscious defiance of Newton breaks out in a paean to colour as the creative force, a denial of the Lockean position that the qualities derived from sense-experience were subjective and unreal when set next to the laws of mechanics and the quantitative analysis; in Blake this anti-Newtonism reaches a matured philosophic position. In turn these romantic positions beget the great colour-art of Turner and Delacroix, the increasing concentration on light which culminates in the Impressionists. There is no space here to elaborate these points; but it is highly significant that just as the alchemists developed their belief in the primary importance of colour in their reaction against purely geometrical and arithmetical notions of matter, so the romantics developed their

retort of colour-arts to the Newtonian mechanism. We may add that the last word has by no means been scientifically spoken on the nature of colour and its function in the universe.

Now to return to the more direct problems raised by alchemy, we might say that what happened with Galileo was not the overcoming of the problems raised by the Aristotelean schema; it was rather simply the reversal of the situation. In the classical Greek view, man was cut off inside his own qualities; in the post-Galilean view, he is cut off outside the world of quantities. The alchemist sought to work outwards from the isolated bundle of qualities into the grasp of processes where objects remained whole and yet fused with one another into new unities. He failed in his objectives, because he tried to do too much with too little in hand; and with all his vast hopes he had far too limited a view of what the problems of material transformation involved. With his newly-found faith in the possibilities of transformation he had no sense at all of the stabilities or symmetries of organised matter, of the depths to which he must penetrate before he could touch the levels and the systems of transformation, of the minute and fugitive complexity of those systems. Despite the many tributes paid to Demokritos, no attempt was made to consider transformation at the atomic level. With the poor means of measurement at the disposal of scientists in ancient days we could not indeed expect any attempts to define elements at that level; but we may still wonder at the lack of any general theorising on this point, especially as Plato had given a basis for the discussion of differing geometrical structures among the atoms.[8]

However, when the worst is said, the remarkable nature of the alchemic aim remains. We may definitely claim that the alchemists were the first scientists in the full sense of the word. That is, they did not merely contemplate phenomena and seek to deduce regularities from them; they did not merely make models on mathematical principles to reflect the operation of phenomena. They took a fully active attitude. They sought to grasp the nature of process itself and to test out their ideas in the laboratory, to recreate and repeat phenomena under controlled conditions. That their controls were too often inadequate and crude is beside the point. They did make the attempt to grasp and recreate processes, and that is the crucial thing.

In this they show their link with the craft-world; for there the



question of understanding processes so as to be able to repeat them is the essence of the whole business. The alchemists thus reveal the breakthrough of the craftsman into the world of scientific contemplation and model-making. Contemplation becomes the theoretical side of the active effort to control and change matter; model-making becomes the practical work of grasping, modifying and changing reality. The alchemist accepts nature for what it is, in order to change it into what it might be; accepts himself for what he is, in order to change himself into what he might be. The lonely struggle with substances in still or alembic becomes the struggle of all men to free themselves from existing fetters and to advance into a qualitatively new sphere of experience, a new social union. Zosimos in announcing the indissoluble link of theory and practice has brought something quite new into culture; and it is this more than anything else that sounds the doom of the ancient world with its bias towards contemplation and its sense of the active sphere (apart from war and government) as servile.

In the last resort it is this *unity of craft-process with theoretical thought* which is the great revolutionary mark of alchemy and which explains why it could find no accepted place in the systems of the ancient world. When in the 17th century an assured scientific method was at last established with a mixture of the particular and the general, with an appeal to experimental method, this was not the same as the alchemic unity; for the concept of nature in perpetual qualitative change was omitted and in its place was put the concept of perpetual quantitative movement. Therefore the question of directions and of values was not present. For the exponents of post-Galilean science this lack has seemed a proof of virtue and of objectivity. The alchemist would reply that if you exclude humanity (the concrete object of qualities), you exclude reality in any essential sense and your results have a limited and ultimately anti-human aspect. This book is not the place to argue such problems out; but I should be failing in my love and respect for the alchemists if I did not add that in this matter I am on their side. That is, I consider a true and complete science to be one which includes the alchemic viewpoints, but with the addition of the various methodological precisions which are the great achievement of post-Galilean developments. The complete science I visualise would then be one capable of dealing with more than symmetries in nature, the stable states which quantitative

analysis can compass; it would know how to grasp and define at the same time all crucial points of change, in which new qualities emerge; and it would vitally link its inquiries into natural process with the needs of a humanity that knew where it was going.

What is implied by these comments may perhaps be made clearer by a passage from the writings of a great critic of the unconscious assumptions and preconceptions of modern science:

> The assumption, that cause equals effect, dominated the later phases of Greek philosophic thought, and determined the entire development of exact science. Plato asked "how can that be real which is never in the same state?" Aristotle held that "in pursuing the truth one must start from things that are always in the same state and never change". Greek atomism and, until recently, modern atomic theory found the real basis of nature in permanent and unchanging constituent units. Quantitative physics abstracted ideal reversible processes from observed phenomena and constructed quantitative energy-functions which were conserved in the processes which it treated as isolable. J. R. Mayer based his formulation of the principle of the conservation of energy on a general law of the quantitative indestructibility of cause.
>
> So remarkable has been the success of this assumption that few have noticed that it is an assumption, and fewer still have seen grounds to question its adequacy . . . [But] the invariant factor in process need not itself be timeless, but may consist in a universal tendency towards a defined end-condition. The clue to the order of nature may not be a principle of permanence, but a universal pattern of process displaying an invariant one-way tendency. For it is not change, but only arbitrary change, which eludes the rational intellect. ( L. L. Whyte.)[9]

This, in my opinion, is the sort of science that the alchemists glimpsed; and it is perhaps a heartening thought that the men who founded the unity of scientific theory and practice in consistent laboratory-work had such a system in their minds, however inadequate were their methods for realising it—that their essential positions were opposed to mechanist assumptions which, in place of the real universe of irreversible process, put an abstract symmetrical construction where action and reaction are equal and opposite. With all their limited applications they yet saw reality as unitary, concrete, involving critical or nodal points of change, and consisting of interrelated hierarchical levels of organisation; and they wanted a method above all which brought all these aspects together. They saw human values as implicated in every phase of the work and as determining the direction of research from within the processes, not merely as a system of ends imposed from without.[10]

# Notes

## 1. GREEK SCIENTIFIC THOUGHT BEFORE ALCHEMY

1. Tannery (3) 310 thinks it the organising period; Burnet, the opposite. "Hesiod's conviction that he lives in the decadent Iron Age now becomes in E. the belief that his own human existence is wedged in between a Golden Age of the past, when Love prevailed, and a brighter future when that Age shall come again, only to be vanquished by the reign of Hate," Jaeger, *Theology of Early Gr. Philosophers*, 1967, 143. For rel. of E. and Anaxagoras, and notion of the Elements, O'Brien.

2. Santillana, 115 f.

3. Cherniss (2) argues that A. overstates the role of opposites in earlier stages; but he does not grasp the deep primitive roots.

4. See for example JL (2) and (3). In a more abstract way, Levi-Strauss in his *Totemism*, etc.

5. Cornford 25 f.

6. Demok. fr. 164; Cornford 35

7. *Peri phys. paid.* xvii (Litrée vii 496); Cornford 36 f.

8. CH iii 91, no. xxii; cf. Aetios v 11 (Diels 422a 13); Ps.-Galen, *hist phil.* 115 (612d), cf. Aet. v 3–19, Stob. 1 42 (i, 294–6 W.); Gal. iv 603, 607, 609, 613, 626 (Kühn), Wellmann, *Pneum. Sch.* 100 ff; Tert. *de an.* v 4, xxv 9 (Wasz. comment. 128 f, 333 f); Scott iii 405–70, Ferguson iv 447 f; J. Kroll (2) 249–51.

9. *Tim.* 63c; Cornford 38 f. See also Bochner (1) 155 on Arist. *phys.* iv and *topos* of a body as the inner boundary of what it contains; 152–60 for concepts of space in Plato and Aristotle, and A.'s concepts as viewed from thermodynamic angle, 159; further Bochner (2).

10. *Tim.* 81a.

11. *De gen. et corr.* 323 b10; Joachim *ad loc.*; Theophr., *de sens.*

12. Sext., *adv. math.* vii 116; Arist. *de anima* 409 b 24. Diog. of Apol. had soul = air, primary element, so the soul could know all things on the like-to-like principle; *Tim.* 27; Theophr. *de sens.* i. For general principle, Plato, *Lysis* 215c; Arist. *E.N.* viii 1, *met.* 984b 23.

13. *Ent.* iv 4, 40, cf. ii 4, 5, "The eye, which is luciform, extending itself to the light, and to colours which are illuminations, says that what is under colours is dark and material and concealed by the colours."

14. Bochner (1) 167 f. Galileo of course had his predecessors (M. Clagett, *The Science of Mechanics in the Middle Ages*, 1959) but was nonetheless decisive in his advance.

15. Arist. *phys.* vii and de caelo iii; (1) 65 f; Themist., *phys.* 208, 13.

16. Garnsey, 3 & 24; Plout. *mor.* 719 bc; Farringdon (1) 29 f.

17. *De re rep.* i 43.

18. Sambursky (2) 92–5; breakdown of Aristot. concept of topos, 95. Greek maths. failed to get beyond idealisation, a process of abstraction from "direct actuality," Bochner 18.

19. *Mechanikē*: *post. analyt.* 78b 37; Heath (1) 11 f. Aristotle, *phys.* (193b 22, 194a 15), wonders if astronomy, *optikē*, and *harmonikē* can be distinguished from maths.; but here, as in *Metaph.*, is sure that physike is distinct: Bochner 144 f.

20. A. N. Whitehead, *Concept of Nature*, 1930, 24; Bochner 180 f: see 145 ff for Aristotle; also Solmsen and W. D. Ross.

21. *Phys.* 225b 16 to 226a 23: "nor becoming of becoming, nor in general change of change."

22. Bochner 168. Eudoxos established the volumes of cone and pyramid: the first form of integral calculus. "Lacking a kinematics, the Greeks had little inducement to develop a coresponding different calculus," Santillana 236. But both lack and no-inducement came from the same socio-intellectual basis.

23. Sambursky (1) 48 f; Iambl. *de comm. math. sc.* xxxii (93, 11).

24. *Tim.* 87 cd. For Philolaos: Plato, *Phaid.* 61d; Apollod. (Diog. L. ix 38); Diog. L. iii 6; Cicero mentions him as Pythag. teacher of Plato, cf. *Interpr.*, DL iii 6; Iambl. *V. Pyth.* 23 and 31; Porph. *V.P.* 40. Said be first Pythag. to publish doctrines; his works were said to be called *Bacchai* (prob. name given by an admirer). For demiurge: Dield, *Vors.* i 301, it seems possible then that Demiurge was a general Pythag. idea. Demokritos had also the concept of symmetry and a-symmetry: "Some (atoms) rebound in random directions, while others interlock because of the symmetry of their shapes, positions, and arrangements, and remain together. This is how compound bodies were begun," Santillana 146.

25. *Tim.* 58de. Aristotle wanted to explain perceptible things by perceptible principles; saw maths. as merely such things abstracted from their qualities; never asked if math. elements (e.g. geom. shapes) could be used as symbols to describe physical realities; never grasped that Plato did not attribute weight etc. to his triangles. Thus both Plato and Demokritos came under his censure. S (1) 29–31.

26. *Tim.* 59 bc. Various kinds of fire, 58ce. Fifth element: Lloyd (2) 103 f, 134–9. 160 f; F (1) ii 251 f; *Epinomis* has the five elements.

Stephanos speaks of the 5th element, which in medieval days became the Quintessence.

27. *Tim.* 50ab.

28. *Tim.* 59ab.

29. *Tim.* 37c. *Paradeigma*: *Rep.* vi 500de; *Theait.* 176e, 3. Note play on words, *ēgasthē*, rejoiced, and *agalma* (thing-of-joy).

30. *Tim.* 50e.

31. *Tim.* 52e. Note passage of Demok. cited above. Cf. example of blowing through pipe into bladder of sand and lead filings, Cornford 37.

32. *Tim.* 55d, cf. *Phileb.* 17e. There is metaphor of joiner and wood, *Tim.* 69a (*hyle* = both wood and matter); also in same sentence a metaphor from weaving.

33. *Tim.* 31b; 35b, cf. *Soph.* 244 f, greatest kinds or main categories: Storey. I have no room here to discuss the many dialectical ideas in Plato. Note that *to pan*, the whole, appears often in *Tim.*, a term much loved by alchemists.

34. *De caelo* iii–iv; *de gen. et corr.*; *met.* etc.

35. Holmyard (4) 17 f.

36. *Met.* iii 6, 378c; 378a 26 ff; 388a 13 (included silver, tin, and prob. lead); 389a. Realgar, ochre, ruddle all used as red pigments.

37. Joachim (1); S (2) 12.

38. Olymp., *comm. in Met.* (Stüne 270, 24 f); Eicholz, 28 ff. Alchemists identified dry vapour with sulphur, moist with mercury; developed theory all metals made up of mercury and sulphur.

39. Eicholz 15 ff; 20 f on filtering in *Tim.* 60bc. Fire, *de lap.* 54; Eicholz 38; *Tim.* 67c on. I would like to discuss here and elsewhere in the book Greek views on light, colour, vision, but can only refer to the account in Theophr. *de sensu.*

40. Arist. *met.* 341, 16 and 340b 29. *De sensu* 443a 21 f, 27 f. Hard to envisage: *Met.* 34qb 15. Gradings of colour: Plin. xxxiii 59; Lippmann (1) i 7; Eicholz 118–120.



41. *De lap.* 58–60. Kermes: from which red dye, really an insect though the ancients did not know it. Distempering: Hdt. iii 8; Thouk. iii 20. Silvermines: Laurion. Date of invention, c. 405. No doubt K. had rented a holding at mines, but after Spartan occupation of Dekeleia, 412, he migrated to Asia Minor, hoping for gold in river-valleys. Eicholz, 8–12, 127; Thorndyke (2) errs to date, 7 f. Theophr. says whitelead, verdigris, cinnabar, all produced by imitation of nat. process of separation, *ekkrisis* (Arist. *meteor.* 381 b8).

42. S (2) ch.i, 1, and his discussion of the idea of the elements. For early use of "breath", Anaximenes, see Croissant on ultimate mechanistic basis. Heidel notes how even in Hippok. treatises physiological processes are conceived in terms of inanimate nature. Cannot go further into the pneuma of the Stoics and allied Iranian concepts; sperm and *pneuma*, CH iii p. lxxxiv on; *dynamis pneumatikē* or sperm, Galen, *ib* xcv. *Asthma*: Edsman (1) 221; Bidez (1) ii 155; Cumont (6) 407 n 2 etc.

43. DL vii 156; Galen, *nat. fac.* i 11, 25; ii 4, 89; S (2) 3 f; Cic. *nat. deor.* ii 23–8.

44. Galen, *de loc. aff.* v 1; Plout. *stoic. repug.* 1034d. Sleep as relaxation of sensory tension, DL vii 158. For *pneuma*: add H. Thesleff, *Intro. to Pythag. Writers of the Hellenistic Period* 1961 68 f; G. Verbeke, *L'Evolution de la Doctrine du Pneuma* 1945 (esp. 119 f; 156 f); F. Bréhier (1) 152 and 211 (*pneuma* characteristic of Middle Stoa).

45. S (2) 7 f with refs.

46. S (2) 9; Galen, *nat. fac.* ii 3, 82.

47. S (2) 22 and 18–20. *Dynamis of pneuma*: Stob. i 371, 22; Simplik. *categ.* 165, 52–166, 29, and Gal. *meth. med.* i 6 (Arnim ii 494). Plot. *enn*, ii 7, 1. 52–2, 2. Chrysippos: Plout., *stoic. rep.* 1078e. For cosmic god: F (1) ii 238–47. All is One: perhaps going back to Xenophanes of Kolophon (c. 570–460), Diels *Dox.* 111,3 to 112, 2; also 565, 24 and 604, 18; *Vors.* fr. i, 40, 25; Plato *soph.* 242d; Norden 247 (1965 ed.); Orphic frag., Clement *strom* vi 259; gnostics, *ib.* iii 524.

48. Zaehner 200 ff claims for Zoroastrianism a kind of evolutionary concept: no ref. to creator, everything seen as a process of becoming from a unitary infinite and eternal Timespace (primal matter). Four stages lead to the full cosmos.

In general, for the nuances in the stress on the importance of the theoretic life and the weak form taken by the "mixed life": R. Joly, *Le Thème philosophique de Genres de Vie* 1956. Relations of slavery to all this: P. M. Schuhl, *Machinisme et philosophie* ch. i, 1938; A. Aymard, *J. de Psychologie* 1948 3 29 ff; G. Vlastos, *Philosoph. Rev.* 1941 289–304 etc.

## II. HISTORICAL REFERENCES

1. Koch no. 318 = Zonaras 1366 (dealing with *molybdinon* for *molybdon*). Wilamowitz thinks it of unknown poet. Berg: *lucerna*, cf. Schol. Aristoph. CLOUDS 1065.

2. Erman (6) 45; Lorimer 20 n 7. Cf. Erman (6) 31 n 5 of the divine serpent. Pindar, *Isth.* v. Golden gods: P. Walcot, *Hesiod and N.E.* 1966 67.

3. Prob. from Larsa: Dussaud. Lorimer 16 f for exs. of part-gilt statues of deities, or figures of gold, Ras Shamra, Egypt, Shushinak (Elamite), Phoinikia, nude goddess with gold boss in navel (LAAA xxi 89 ff); Bel-Marduk in gold (Hdt. i 183 etc.); cow of Mykerinos (Hdt. ii 129); golden calf of Israel. Gold in Min.-Myk. images; Greek, 18–20. The Greek *chrysos* is Semitic: Assyrian *hurasu*, Aramaic *hara*, Hebrew *charuts*.

4. *Od.* vi 229–35, cf. xxiii 159. Alkman, Lorimer 22, Diels, *Vors.* i 29 (23–4), ultimate source Aristotle; Louk. *Alex.* 246. Divine kingship with gold animal; gold=purple (Macr. *Sat.* iii 2, 1), Lorimer 32 f. Gold hair as divine attribute: A. Alföldi, *Rom. Mitt.* l 1935 142 f; Caligula and gold beard, Suet. *Cal.* lü.

5. *Works and Days* 109 ff. *Dan.* ii 31–5, cf. vii 1–10 where 4 winds and 4 great beasts prelude the day of judgment. See also Hippol. *in Dan.* ii 13.

6. BC i 217 ff; ii 367. *Yasht*: i 1 ff, ii 14ff. Other Persian dreams: Windisch, 46 ff; Cumont (1) 72 ff; RE 430 f, *sv Hystaspes*, 542, 3 ff.

7. BC ii 218 f. Christian reuse of the system: Wickenhauser.

8. R (11) 39 ff with refs.; Ruska (2) 52; BC i 206.

9. Rep. 450b, with dyeing imagery in 430; *Paroemiog. Gr.* (Leutsch-Schneidewin) i 46 and ii 91, 727. Deinarch. cited Harpokr. fr 6, 13. *Souda sv.*; Bekker, *anec. gr.* i 316 has gloss to gold-smelting = to go whoring. It would be going too far to see there an anticipation of crucible or still as womb. The mockeries in the *Souida* anecdote suggest a flyting rite.

10. Plin. xxxiii 103 f; MM v 110 and 95. Diosk. said to write also books on Poisons, Poisonous Animals, Common (or Family) Medicines Simple and Composite. Herbal in Antiquity: Singer (1), 19–29 for Diosk

11. P. Holm. iv. 33 and ii 38; Synesios 68b and 69b; the two *hydrarg.*, quicksilver and metallic arsenic, Plin. xxxiii 6, 32, 99.

12. P. Leyd. 66 (Reuvens); B (2) 68 f. See also B (1) 83.

13. NH xxxiii 4. Lucan ix 424–5, "The earth is not cooked (smelted) for copper or gold." *Apocoloc.* iv (lines 6–9).

14. Manil. iv 243 ff.

15. *Aetna* 260–3; the imagery here however comes from greed-tortured man identified with the earth he ravages.

16. *Satyr.* 76; cf. Columella iv 1, 7, "The soil of a trenched plot, newly broken up and loosened, swells as if by some *fermentum*." Also ii 14, 1 and xi 2, 13; Varro RR i 38, 1; Plin. xvii 2, 2 (15); xxviii 8, 28 (109).

17. Col. ix 14, 6; i *pref.* 32, cf. i 1, 7, with Mago as to setting of vineyards; viii 8, 7, how to keep kestrels at home; xi 3, 2 (his *Georgikon*) as to garden walls; xi 3, 61, for doctoring seeds with juice of house-leek.

18. Col. xi, 3, 64; just before, he says seeds soaked in house-leeks are avoided by caterpillars.

19. Col. vii 5, 17.

20. Plin. xxx 2; xxiv 17; xxv 2; Solin. iii (Saumaise 13).

21. Sen. *ep.* xv 32 f: Diels (5) ii (5th ed.) 218 n. And Vitruv. *praef.* vii. See Kunz 16 for belief emeralds come from jasper. *Ep.* lxxix 14 for tale of Abderites thinking D. mad and calling in Hippokrates to cure him. Plin. xxxvii 75 (197). Alch. MS 2327f 147. Also BC i 194 f; Wellmann thinks Plin. is citing *Baphika* of Bolos.

22. Ail. v 39. Cf. Cramer, *anec. gr.* ii 235, 32; also *Kore K.* Tale taken on to Apion, Horapollon (i 12 cf. i 17), *Physiologus* (i 2: 339 a 19 Pitra; 5, 1 Sbordone). See also Plout, *quaest. symp.* iv 5, 2; Macr. *sat.* i 21 ,16 f; Solin, 27, 13 (Momm. 2nd ed. 219); schol. I *Il.* xi 554; St. Eulog. of Alex (Pitra p. lxvi and 424 425b); F (2) iii p. ccvi.

23. Tac. *ann.* xv 14; also found as Pamenes and Pamenasis. MS 2327 f29; AG 46, 70; T (2) 118, no work of alchemist has come down. See also Synk. i 471 (Dind.) + BC ii 31; Diels (2) 134 n 1; BC ii 312 n 2; Gundel (3) 242. AG 49, 8 and 148, 15; Pammegethous (not Pammenous); Steph. calls Demok. the *pammegas* (all-great): Preisend. RE xviii 1633, 10; F (i) i 226 n; Lagerer. *P. Holm.* 105 f.

Phimenas: Leyd. x 11, 15. Probably not the same.

Chaldeans: a tribe of lower Euphrates and Tigris; already C. is used for magician in *Book of Daniel*. Especially famed for horoscopes: Bardasanes *Spicilegium* (Cureton) 15; Plout, *de is.* xlviii. A late Jewish book on Wisdom, God, star-motions, is called *Wisdom of the Chaldeans*: Gaster PSBA 1900 338. Also Strab. xvi 1, 6; Ail. *peri zōōn*, A xxii (Hercher); Diod. ii 29; Lewy (2) 425–8.

24. Plin. ii 23; vii 49; Juv. vi 581. Plinius has "Petosiris, Nechepsos, the Pythagorean Philosophers . . ."

25. Their system was that used by Dorotheus of Sidon, Firmicus Mat., Paulus Alexandrinus: Bouché-L. 206–10; Ptol. *tetrab.* i 20; for frags., E. Reiss. Date: Kroll (1); Neugebeuer (1) 5, 28, 185. Galen, *simples* x.

26. Frag. 1 (Reiss).



27. NH vii 49 (160).

28. Letter: 2419 f32. Petasios: 2327 f150; 2249 f35v. Ostanes: 2249 f35 and 75; Mark 7v.

29. T (2) 118.

30. See Athen. iii 114c (Aristoph., *Daughters of Danaos*): "Sing too of our sour (*kyllestis*) and of Petosisis."

31 Nechepso: Firm. Mat. iv 22, 2 = fr. 28, 4 = Reiss (2) 379. Stoics: Prantl, *Deut. Viertelj.* (1856) 150. Ennius: *Comm. in Lucan. Bern.* (Usener); BC i 204 n. 1. Plin. xx 1; Weidlich 1894 18 ff.

32. Epiktet., Nestle i 88 and ii 207; Stob. frags (Schweig) compares the gold-testing stone and the faculty of reason.

33. *Face in moon* xxi. See also *cess. or.* xxxi–iv and xlii: evaporation, also asbestos-cloth. *Face* vii–viii on gravitation as sympathy, like to like.

34. Marc. Aur. iv 36 f; Lippmann (5) 14.

35. Origen, *C. Cels.* vi 22. T (1) 55 f; Cumont (3) ii 525 and (4) 122, 145; Kroll (3) 63; Lobeck 932; Bousset (1) 165, 237; Cook, *Zeus* ii 129 etc.

36. Kronios–Noumenios: Prophyr. *de antr.* 21 ff (Leemans 148).

37. A sort of Pythagorean Platonist: Cumont (2) 107; Dill (1) 600; Julian v 172ae etc. N. said that Plato was Moses talking Attic.

38. Vermaseren 157 etc. In gen., Cumont MMM i 36 ff; ii 30.

39. Elements: F (2) iv 45, nn. 206 f: fire as the one incorruptible element. Vermaseren 158 f: cf. mosaic of 7 Gateways where we meet vessel and snake (appearing from the rock) with raven or eagle on thunderbolt. Often a lion is by vessel and snake. Vase, snake, lion, bird, bolt on Trier relief of M.'s birth.

40. Edsman (1) 222–4. Lion: Cumont (5) 406 f, also Eitrem (2) 43.

41. Later the scheme was made 12-fold under Zodiacal influence. Origen and history: *in Joh.* i 20; Angus 388. Ladder-symbols of ascent have a rich history from Siberian shamanism etc. to Egypt, Orphism; taken into Christianity via Jacob's Ladder. Chitty 173 f. In Chald. oracles: precipice and seven-fold ladder: Lewy (2) 294, 412–5.

42. *Face in moon* 28, 943d; Kaibel *epigr. gr*, 650 and Cumont (2) 163; Haussouillier, R. *de Philol.* xxxiii 6. See F (15) 174.

43. Reville, *Relig, à Rome sous les Sévères* 94; Julian 336c.

44. Tert. *de cultu* 2b; *de idol.* ix d; *de cultu* x; *apolog.* xxvc; and B (1) 12 f.

45. KK = CH xxiii 24, 4, 45; Scott iv 140 n. 1. The legend appears in the Syriac Zosimos: B (4) ii 238.

46. Firm. Mat. v 6 (Kroll-Skutsch ii 3, 14); Louk. *gall.* xviii; *Rev. Bibl.* xlviii 46 n. 5; Scott iii 491–3.

47. F (1) 319; BC i index *stēlai*; Boll (3) 7 f; cf. Plato, *Krit.* 119cd; Hekat. Abd. 264 F7, 4 i; F (1) i 230 n. 6.

Euhemeros: Jacoby RE sv, vi 963 f; FHG 263 F1: Euhem. 63 T3, P 3C. 46, 3, 8. Isis: Peek; Diod. i 27, 4.

48. Plato, *ax.* 371a; Cumont (2) 48 ff.

49. *Face in moon* xxvi, 942c; C (2) 196 n. 3 on night of demons serving Kronos (945d) in north sea.

50. Frag. 3, P. Rain. col. ii 17–20 (106 Manteuffel).

51. CCAG vii 62 f177 = viii 4, 105, 4; Cumont (2) 102 f; F(1) i 207 and 320. CCAG vii 59 f157: *theosōstos stolos*. Boll suggests Trebizond coast in Pontos.

52. *Tetrab.* i 21 (47 f).

53. Delatte (9) 15, 11; F (1) i 322; Steele (4). For the stone, cf. the talismanic monuments set up near towns by Arabs to ward off harm: Blochet 49. Al-Razi: Ruska (9) esp. 240–2. For "jealous", cf. 330 f. Arab Ghajat al-hakim (Latin, *Picatrix*): Ritter 34.

54. Delatte (9) 213; F (1) i 323. Boll (3) 136 f; Ruska (2) ch. iv, 61 ff. Arabs: Blochet 29 f; Ritter 14. Balinos: CCAG v 1 (p. 98 n. 4) and Stapleton (2) 135. World-end: see *Asclepius* xxvi (CH iv 330).

55. PGM vii 862; viii 41; xxiva = OZ ii 298; iv 883. F (1) i 323 and 287 f. CCAG viii 4 (p. 105, 1 ff); PGM xii 401. F (1) i 207 and 221 n. *Lunarium, selenodromion*, coll. of passages for each day of moon-month. The names were symbolic and so could lead to mistakes: F (1) i 222 n. 1.

56. KK 17 and 22, cf. CH lxv 7 f and lxix 6–11.

57. *Enoch* vii 1 (26, 2 f); viii 1, 3 f (26); 11–15; 17–20. Medicine: F (1) i 56–9 and (5). Synkellos 26. The sin against the animals is eating them: Bousset (2) 165 ff. For *Enoch*: Flemming-Radermacher; R. H. Charles ii 163 ff. Ethiopic: E. Sjöberg; also see Lynn Thorndyke i 340, all ch. xiii. *Asclepius* 25; Doresse 209 (stress on metal-workers) CH viii 16 f and 14. *Book of Enoch*, lii 2; lxv 7–8; xviii; xxiv; xxxii—mountains. *Secrets of Enoch*, xxvii—creation.

58. *Enoch* viii (26, 11 R.). Ethiopian adds *paignia* as does Bolos, *Phys. baph.*, AG 242, 10 (Hermes). Wellmann (1) 68; Diels (2) 128; F (1) i 223.

59. *Poim.* i 4. *Authentia*: CIG 2701, 9 (Mylasa); P. Lips. xxxvii 7 (4th c.) CH i 2; Zos. (hist.) ii 33.

60. KK xxiii 14–6, xf. xxiii etc. *Psychosis*: CH iv 28 n. 55.

61. CE x. 62, 66.

62. De Buck 47; Drioton 114 f; Doresse 272 and 106, Medinet Habu, alleged Jewish influences in Hermetic cosmogonies, *Poim.* iii, cf. J. Kroll (2) 139.

63. Diod. i 7, 1; G. Thomson 157 thinks this the Ionian type of thinking. F (2) iii 66 f, fr. xv. Yeast in Iranian cosmog., L. A. Campbell, *Mithr. Iconog.* 1968 109.

64. *Sympnoia* is esp. a Stoic notion. Date of treatise: Doresse, 275.

65. Spell, Lexa ii 146 (Lond. & Leyd. P. 19, 32 to 19, 4). Simplik.: T (2) 30.

66. Meteor. iv; Farrington (2) 42.

67. *Plants* iii 23, 4, cf. Galen xi 435. The passive appears with Diodoros etc.

68. Diod. ii 52; cf. Heliod. *Aith.* ii 30, 1.

## III. MORE HISTORICAL REFERENCES

1. *Enn.* vi 7, 22; Bréhier (2) 43; Rist 97. Gold: *enn.* i 14, 23; Bréh. (2) 33. Souls: *enn.* iv 3, 2 f and 5; iv 8, 6, soul as active organising principle.

2. *Peregr.* xxvii. *Anistemi*: *Il.* xxiv 551 and Aisch. *Ag.* 1361. Wake up; *Il.* x 32 etc.; disease, Soph. *Tr.* 979. *Enn.* ii 4.

3. Pers. *sat.* ii 58; Petron. *satyr.* 58, 6; Lorimer 21 n. 2.

4. Iren. i 6, 2.

5. *De myst.* v 23; iii 27.

6. *Ib.* v 11.

7. Eunap. *Lives Phil.* 458; cf. Plato *phaid.* 64b for laughter. Boissonade 15.

8. *Ib.* 459 and 473.

9. MS 2327 f 266 f. Amm. Marc. xxx 1, 16.

10. Lippmann (1) i 103 ff; B (1) 72. Reproduced by *Souda.*

11. Bolland. Julii 11, 557a; B (1) 72 f.

12. Paul. *sent.* v 23 and *leg. Cornel. de Sic. et venef.*; Cod. Greg. xiv, *tit. de malef.* 6.

13. Rauschen 127; Boissier ii 271, 296; CT xvi 19, 10 (20 Feb. 391); Constantius CT ix 16, 4; ix 16, 8. Amm. Marc. xxvi 3; Zos. (hist.) iv 13: fear of conspiracies.

14. RA xxx 1924 144.

15. CT ix 21, 1; Grierson 251 f. Bronze counterfeiting seems not always covered by legislation or the jurists' lawbooks.

16. CT ix 21 5 and 6: the latter, to the P.P. of the West, may have been issued Nov. 348, prob. from somewhere in Asia Minor.

17. *Digest* xlviii 10, 9 (Alexandreia): Dutilh, Grierson 244.

18. CT ix 21, 2; S. Reinach 215; E. Thomson 36. Liban. *Or.* xviii 138.

19. SHA *Aurel.* xxxviii 2; Soz. HE v 15; R. MacMullen, *Enemies of Rome*, 177.

20. Order: Oxy. 1411. *Matt.* xxii 15–22; Doresse 72. Pap. from Panopolis (Dublin)



1964 ii 215 ff (pp. 147 f); and Yale (Beinecke) pap. (1967) no 79. *Argyrion*, Johnson and West, *Currency in R. and Byz. Eg.* 1931. See also Michaelidae no 12. For doubts as Diocletianic suppression: W. J. Wilson, *Osiris* 1936 ii 262. Magic: *P. Mag. Leid. W.* 14, 38,

21. T (1) 18 f; B (1) 239; F (1) i 275 f and 363 f. Third text: Olympiod. F (1) i 276 n. 2. Smelting, *epsēsis*; series of ops., *akolouthia.*

22. Diod. iii 11, cf. v 38 on Spanish silver-mines; G. Thomson (1) 242 f. Cumont (1) 97 n. 2 and 49 (monopoly); under Tiberius, a *metallarches* in charge: Letronne *rec.* i 143 and 454; OGI 660, 2. Generally workers in mines were free from 4th c., A. H. M. Jones, *Econ. Hist. Rev.* 1956 197.

23. Recipes: Browne (1) 202; T (4) 49. Making of silver: *poiēsis.*

24. Firm. iii 15 *in nono loco*; iv 16. And B (1) 74 and 32. Olympiodoros (Fabricius v ch. 6) attribs lead to Kronos, electrum to Zeus, gold to sun, bronze (copper) to Aphrodite, tin to Hermes, silver to moon. Cf. Mark f6 (Ares iron).

25. Prok. *in rem. publ.* 70 (ii 234, 17).

26. *In Tim. Comm.* 24b (i 43, 1); S (1) 59 f; B (1) 48 f.

27. *Ib.* 337e (iii 321, 24); S (1) 60.

28. BC i 246 n. 1; Boll (2) 155 ff.

29. *Tetrab.* i 2 (2, also 3 and 8). *Aither* is the 5th element.

30. *Poikilos* and its relation to Dionysiac and alchemic concepts of dynamic change: JL (4), esp. 380 ff.

31. Pupil of Hierokles and friend of Prokopios. For the rel. to Zacharias and the the group of Severos of Antioch, Chitty 104 f. Authorship of works of "Dionysios", Chitty 120 n. 59. For Aineias: Sheldon-Williams 484–8, with refs; ps.–Dionysios, *ib.* 457–72, 523–5.

32. Theophrastos (Barthius 1635) 71; B (1) 74 f.

33. *Ib.* 76. *Colorent* is from Boissononade edition; also Galland.

34. Fourth *praxis*: MS 2317 f50; Ideler ii 215.

35. Monceaux 124 f; Edsman 168; Crutwell 97. When P. was stabbed, his blood spirted out and extinguished the fire.

36. Euseb. HE iv 15; Amélineau 411; Bardenhewer ii (2nd ed.) 670; W. Reuning, *Zur Erklärung d. P. martyriums* 1917.; H. Müller, *Rom. Quartalschr.* xxii 1908 8; Knopf-Kruger, cf. *Apoc.* i 15, *Ausgewählte Märtyrerakten* 1929 5. f.

37. Edsman (2) 91 and (1) 171; Moberg 31.

38. Greg. 2, 301b; Guignet 147.

39. *De trin.* 34; PL xvii 545b. Edsman (1) 196 f, and (3).

40. PL xvii 544c.

41. Kedrenos 359a; Malal. 395, 8; Theoph. 128d.

42. S (1) 158–60; Philop. *meteor.* 47, 18; *de opificio mundo* iv 12 (184, 26); Simplik. *de caelo* 89, 4.

43. S (2) 102; Philop. *de anima* 120, 34. He accepts Aristot. idea of metals from enclosed "vaporous exhalations," *Meteor.* iii 6.

44. Browne (1) 213 f.

45. Scaliger: *Euseb. Chron. Animad.* 1606 258; *synkellos* means personal attendant on a patriarch etc.

46. B (1) 130 f.

47. Oxy 467; for *stypteria* note P. Holm. 16, 32; see also for alum monopoly, Oxy. 1429 and 2116.

## IV. THE NAME ALCHEMY

1. Aristot. HA 550b 27; Diod. xvii 75; Alk. i 23; Ptol. *tetr.* 19; ingots, IG vii 303, 104, 442 B6 and 1432 AB i 17; Agathark. 28.

2. Synk. (Dindorf) 24; Diels (2) 109; B (2) 94 Olymp.; John. fr. 15, 3 (FHG iv 548); *Souda sv deras. Chēmeia*: anon *Incred.* 3 cod. fr. 165 (FHG iv 601); cod. Paris.;

*Suda sv* Diokletianos and *chēmeia*. *Iliad.* xviii 470 ff; Hes. *theog.* 863 ff. *Choaneuein*; Aristoph. *thesm.* 57 cf. 62.

3. Zos *l.c.* and B (2) 169, 172; Olymp. B (2) 84. *Chymia*: Hoffmann in Leidenburg, *Hist. d. Chemie* 1884 ii 516 f, 525. Zos. B 220. *Chemeutikos*: Olymp. B 80; *cheim—*. *Souda sv* Zosimos.

4. Stephanides (6) derives *chyma* from *chymeuein*, to prepare a *chyma*, but the word is not found. *Chymeusis* is found in EM 630, 52; Eustath. 826, 16; Tzet. *ad Hes. sc.* 122. Zacharias assumes *chymeutes* to be a Hellenistic term for a man preparing foods and medicines, 119 and 124. Further, Strange 3. See Liddell-Scott for other terms.

5. Partingdon (1); Mahdihassan (1) 93 f for details.

6. *De is.* xxxiii. R (1) 140, to Isis. Attrib of land: Phil. Bybl. in Euseb. *Praep. Ev.* i 10, 38.

7. Athen. xiii 603 f to 604b. Place and date: Thoukid. i 116. In Eunapios, *Lives Phil.* 459, the Eros raised by Iamblichos has golden hair, the Anteros has black hair.

8. KK 32 and PGM vii 492 f.

9. Zielinski takes as *chemia*; also F (8) 116; but F (2) iii p. clxiv–viii, the Land is preferred. Note Lippmann seems in error in linking koptic *chomnet* (copper) with *chyma*: Forbes (1) ix 60.

10. F (1) i 253 ff; Scott iv 145 ff.

11. F (2) iii p. clxviii; R (1) 137–43.

12. Doresse 107; F (1) i 288; PGM xiii 14 ff. Book of Moses: PGM xiii, Leyd. W. Hermetic school with Books of Thoth: Dieterich (2) 165. Stephanos: T (4) 43 f. There is an odd sign that may be "rainwater".

Ostanes used only the metallurgical way: B (2) iii 61 n. 3 and i 59 ff. Note Ep. to Leukippos (BC i 201), where Demok. rejects the way of the Egyptians: B (2) ii 53, 8 ff (badly edited), 855, 22, "We don't do it like that." Also Riess (4) 1344, 36 ff. More on Ostanes: BC ii 331; AG 264, 19.

13. Lexa ii 174; Leyd. i 385, 1, 11 to 14, 12.

14. R (1) 187.

15. MS 2327 f 214v and 129; 2250 f163; Mark 178. MS 2327 f260.

16. B (1) 171.

17. Revillout, RHR 4th s. viii 425. Letter of D.: AG 53 ff; Diels (5) 68, 55; B (1) 300, cf. DL ix 34. Plato and mages of Phoinikia: BC ii 40. Date of text: Reiss (4) 1344, 30 ff thinks Synesios knew it. See BC ii 314 n. 1 and cf. Zos. AG 239.

18. Rufin. HE xi 26.

19. Harmann.

20. Erman (4) v 130, 12; 128, 12.

21. Forbes (5).

22. P. Masp. 107, 13 (6th c.) and perhaps P. Flor. 286, 23 (also 6th c.).

23. Arist. HA 554 a 13; 596 b17; Theophr. HP ix 1, 1. Animals: Arist. HA 556 b22; PA 676a 16. General, *Met.* 380b2, 32. Taste, *phys.* 245a9.

24. *Tetrab.* xix.

25. Gildermeister 536; Mahdihassan (1) 84, to whom I owe these plant-refs.

26. Mukand Singh 19; Mahdihassan (1) 83 f.

27. Ramsey 161–70 for refs. Also a large altar with *papai* only at Veteston Sinamli (AJA xxxvi 460). Hierapolis: Ruge *sv* H. in RE; Humann, *Altert. v. Hierap.* (text, Judeich; comment. Cichorius, 50 f); CB i 119; ii 545; Waddington no 227. Ramsey thinks Jewish. Notes poppies on bronze coins, John Hyrkanos 135–06 B.C.: Lewin 36. Shamans or prophets and drugs: A. R. Johnson, *Cultic Prophet in Anc. Israel* 1962 20–1; also G. Sandulescu (collective intoxication by honey at time of the Anabasis, *La Presse Médicale* lxxiii (no 36) 28 Aug.–4 Sept. 1965 2070.

28. Ramsey suggests *pappa* underlies words and names such as Peperiön Paphylos, Papoukome Chōrion (CIG 9731, 8), Pappaios Zeus (Skythian). Zeus Papamios (God of dead, Bithynian). For *threptos*, Ramsay 52.



Hemp (used by Skythians as drug) grown in Asia Minor, Mesopot., Egypt in B.C. period: Forbes (1) iv 1956; H. Gordon, *Antiquity* xli 1967 42–9; M.I. Artamonov, *Sc. American* 1965 212: 5, 101; Ellis 32.

Opium well-known as drug and medicine in ancient world: Ellis 44–52, evidence from Swiss lake-villages, Plinius, Celsus, Dioskorides, Diokles, Galen, Rufus of Ephesus. Plin. xx 76; Xen. *banquet* ii; Plin. xxv 17; Loukian *True History* has City of Sleep surrounded by forest of poppy and mandragora, etc.

29. Kerenyi fig. 40.

30. Mahdihassan (2) 51 ff; G. Thomson (1) fig 4 etc.; Strong 130 pl. 16; Blümel, *Gr. Skulpt. d. sechsten u. fuenf. Jahrhund. v. Chr.* A 12 on p. 11 and plates 22–4.

31. G. Thomson 219; Mahdihassan (2) 54. Note N. Gérard (Mykenean doc. about perfumery) AC 1966 xxxv 207–9

32. JL (1) 181–3 citing Apoll. Rhod.; in general, 174 f.

33. Exhort. 16; Cook, *Zeus*, i 107 f; JL 185 f.

34. P. Roussel; Eliade (1) 70.

35. H. von Fritze, *Z.f. Num.* 1904 pl. 5, 27; L. Forrer, *Cat. Weber Coll.* no 2291 and 2298; gem, Furtwängler, *Beschreibung* no 7361. Bonner (1) 326 and 265.

36. Bonner (1) 100 f; and Derchain (2) nos 325, 327 (both of Psyche, see here ch. vi n. 17). For early Iron-works in Ida: *Homeric Epig* x. (ix): "Another sort of pine shall bear a better fruit [iron] than you on the heights of furrowed windy Ida. For there shall mortal men get the iron that Ares loves . . ."

37. For direct alchemic refs., Alleul.

38. Kerenyi 177–80. Clem. *protr.* ii 21, 3; Arnob. *ad. nat.* v 26; *Hymn* 280 f also 47, 50, 200 f; Ovid *met.* v 450: Plin. xviii 72. Fermentation: A. N. Skias, *Eph. arch.* 1901 19 ff; against, J. N. Svoronos, *J. Inst. d' arch. num.* iv 1901 179 and R. Leonard, RE *kernos* xi 323, on ground that there was no time for fermenting in the Hymn. But a mythical account need not take time into account. Drink out: Delatte (11) 39.

39. Pindar fr. 114c Bowra; Q. Sm. ii 182. (Plout. *Perik.* 38, illness.) Herakleitos: Plout. *de garr.* 511c; Diels *Vors.* A 3b; K. Freeman (1) 105. Hipponax: *Anth. lyr.* fr. 42. Effects: A. Hoffman in Kerenyi; Delatte (11) 38–40. Baumeister thought aphrodisiac (*Hymn. hom.* 300); R. Pettazoni, slightly intoxicating; others confuse with poppy: O. E. O. Brien; Magnien; M. S. Lagrange, *Rev. Bibl.* 1929, 73; see also Ovid *fasti* iv 531; Loisy suggests a fertility-charm.

40. *Omnimorbia*: Isid. of Seville, *orig.* xvii 9, 63; see also Diosk. iii 31; Plin. xx 152 and 156 (wild, the same); Ps-Apul. *herb.* 93 (Howald and Sigerist 168); *carmen graecum de virt. herb.* 12; Hippok., Littré, sv index.

*Kykeon* thought to quench thirst, Nikandr. *met.* = Anton. Lib. 24 and Lactant. Plac. v 5; cf. Hippok. *de morb. mul.* iii 17 (L. vii 161). Pancea: H. Leclerc, *Bull. des sc. pharmac.* xxxix 1932 184–90 and *Précis de phythothérapie* (1935 3rd ed.) 148; A. M. van Prooijen, *Pharm. Tidsch. v. Belgien* 1950 11.

41. Kerenyi (2) 34 ff; Harpokration *sv* Nike Athene; Paus. ii 174; Paestum: Kerenyi (3) 195 f; Säflund 55 and fig. 50. Note also how poppy is assoc. with Demeter (mainly), Kybele, Hera, Artemis, Aphrodite: Murr 183 ff; Steier. Note Mykenean ring: Evans JHS xxi (1901) 108; *P. of M.* i 341 Dussaud (2) 392; Karo 149.

42. Schol. Loukian *dial. meret.* vii 4; Artemid. i 73; Paus. viii 37, 7; Porph. *de abs.* iv 16. Haloa: Schol Loukian *l.c.*; Jane Harrison, *Proleg.* 145–50 etc. Seeds: Clem. *protrep.* ii 19, 3; Euseb. *pr. ev.* ii 3, 28; Deubner *Att. Feste* 58.

43. Paus. ix 25, 1; Philost. *imag.* ii 29, 4.

44. Apollod. *bibl.* i 4, 3; Kerenyi, *Gods* 203 (Pelican ed. 179); Paus. iii 22, 11; viii 28, 3; Dionys. *de aucup.* 7.

45. Kerenyi (1) 135 for links with Rheia (Rhea); Diod. v 62, 1 f; Sch. Lykophr. 570; Ovid *met.* xii 652–4. Link with apples and figs, Kerenyi 134; Dionysos, wine apple and pomegranate on Ark of Kypselos etc; Melos, called after apple, had pom. on coins, Cook iii 1, 817. Kerenyi fig. 41, TC (late classical or soon after) of girl kneeling (with Eros) on half of a pomegranate, revealing herself. See further,

Rohde, *Psyche* (Fr. version, Reymond) 198 n. 5; 75 n3; 119; 130 n. 6; 138; Plin. xxiii 6 (59) 110; Heckenbach, *de sacra nud.* 84.

46. Mart. Cap. ii 109 f; Boyancé (1) 95; Plin. xxiv 101, also xx 20; Carcopino RA 1923 1–22; *Basilique* etc 1926 380; Hubaux, *Musée belge* 1926 197 ff and 1928 *herbe aux cent têtes* (tries to distinguish seryngo and leucas). See Delatte (4), cf. Kyranides (Mély) 1 7, 2 and Delatte 480.

47. Boyancé (4).

48. Plin. xx 20; Disok. iii 21 (Wellmann ii 27). Damaskios: Phot. *cod.* 243 (310, 10).

49. Psell. vii 478 (Kroll); *Od.* x 305 and 268 ff. Theophr. ix 15, 7; Diosk. iii 54. Pythags. on moly as immortality or transformation: Boyancé (4) 213 f. Interpolator also calls it *himertos*, cf. Orphic tablet, Kern 32c (line 7).

50. Boyancé (4) 216 f; Carcopino, *basilique* 293. For leap, Roscher *sv Leukas*. For L. as Country of the Dead: E. Janssens, AC 1961 xxx 381–94.

51. Read 13.

52. Plin. xxi 19, 6; see note 32 above.

53. AG 48; T (2) 130; Lagercrantz *P. Holm.* p. 191.

54. *Anagallis*: Synesios, AG 66, 9 and Zos. 160, 7; Moses, 306, 24. Plants in magic: Berl. pap. ii 35.

Leyd. mag. pap. v has symbolic names for plants and stones.

55. Partingdon (2) 8; Forbes (1) i 100 f.

56. B (1) 123; MS 2327 f 268–78 etc.

57. Mahdihassan (1). Lippmann thought alchemy proper reached China from west in 8c after Kanton opened to foreigners; first Arab ship there A.D. 714. Richthofen also thought like that and considered the Chinese forged all the documents, ascribing antiquity to them or interlarding passages in genuine works. See Holmyard (4) 25. Also Eliade 190–2 for refs. For the terms: Dubs (2) 33–5; B. Karlgren, *Grammata Serica* nos 652a and 800n (800n and 686f). *Lie-sein Juan* (M. Kartenmark, *Le Lie-sien tchouan* 1953). T'ang emps.: *Y'ang-shu* 3:12 a (Be-na ed.). T'ang graves have many images of moslem and other foreigners. For Chinese rels. with Syria and India; Needham (1)i 150 on; also here ch, x nn 44–7. Rhytons: ILN Arch. Sect. 2266 (22 April 1967) figs. 6–8.

58. Eliade (1) 131 and (5) 278 f.

59. *Shatapatha Bathmana* xxi 7, 1, 7. Indian alchemy, refs. Eliade (1) 192–4. Indian atomism, Loring 1.

60. Mahdihassan (1) 85, also citing Mrs. Postans, *Cutch*, 197.

61. N. R. Dhar, 1952: Mahd. 85.

62. Mahd. 85–9 for fuller discussion.

63. Christensen i 22; Schaeder 225–9, esp. 228 f.

64. *Zath-sparam* x 2; Christensen 23, 25 and 52 (diamond). Partingdon (1) 297 and 417.

65. Zaehner 267.

66. Zaehner 88. See 85–94, Indian parallels etc. For Soma: E. G. Wasson, *Soma the Divine Mushroom* . . . (also on Chinese *ling chi* and Manichees).

In general: support of *chēmia*, Lippmann (1) i 292–8; Gundel (3) 240 f. For *chymia*: Diels (2) 123 f. See further *Ciba Symposium*; 1940 322.

## V. DEMOKRITOS AND BOLOS OF MENDES

1. MS. 2327 f163; Mark f79; B 1 (1) 127–9; F (1) i 240 f.

2. Mark f7v.

3. Paris MS: B (1) 129; AG 25. Could Thrace refer to Abdera, looking back to Demokritos?

4. Euseb. HE i 4.



5. Sen. *de ira* ii 10; Ail. VH iv 20. Aim: DL ix 45; Cic. *de fin.* v 29. Life: Cic. *l.c.*; Aul. Gel. x 17; DL ix 36; Cic. *Tusc.* v 39; Plin. xxviii 16 (58).

6. Cic. *de fin.* v 19; Strab. xvi 703.

7. Diod. i 98, 3; Ail. VH iv 20; DL ix 35; Clem. *strom.* i 304; Iambl. *de myst.* i 1 (Egypt). D. and astron., Olmstead, *H. of Pers. Emp.* 331–42.

8. Theophr. *de sensu* 75. For aphorisms, Diels, who defends authenticity: note B 35 (1854 ed. W. Kranz). Aristotle on D.: Santillana 147. D. wrote *On Pythagoras*, and Thrasyllos called him a Pythagorean. In general T. Cole, *Democritus and the Sources of Greek Anthropology* 1967.

9. Plin. xxx 2, 8–11 (also on Ostanes).

10. *Philops.* 32 f.

11. Plout. *quaest. conv.* viii 102 (Diels, *vors.* 55a 77). Dodds (1) 369; Delatte (7) 46 ff. This is a theory of telepathy; where senders are inanimate, it is clairvoyance. There is also a creed of divine *eidola* to explain precognition: fr. 166.

12. *Q. Conv.* v 7, 6; Dodds (1) 370. Clement, *Exh.* v, says Leukippos and Metrodoros "inculcated 2 first principles: fullness and vacuity. D. of Abd., while accepting these two, added the *eidola*."

13. DL ix 38.

14. See *Souda* and Eudokia's *Violarium*; Steph. Byz. *sv Apsynthios;* schol. Nikandr. *theriak* 764; Plin. xxiv 102 (160–3).

15. Vitruv. ix 2; Diels *vors* 68 (55) B 300 (5th ed. ii 210); Wellmann (1) 10.

16. Aristot. *meteor.* ii 1, 6: using *cheirokmeta* for devices raising water above its level.

17. Plin. xxiv 99 (156).

18. JL (1) 182.

19. Plin. xxiv 102 (160); he goes on about a contracting flower and a spiderkiller, from Apollodoros, "a follower of D." *Trachinia*, xxxvii, 114 (141), "I think it untrue, and the assurance of D. fantastic, that, used as an amulet, it consumes the spleen in 3 days."

20. Plin. xxxv 5 (13 f). Bird: x 40. Tylon: JL (1) 213. Glaukos: *ib* 58, 109, 209–20, 224 f, 228, 235, 382.

21. Plin. xxviii 29 (112–8) says D. wrote whole book on chamaeleon, giving separate attention to each part of its body. See 27 (92–106) on hyena, to which magi attributed great power "to take away the senses and entice men". Touch doorposts with its blood and mages are made powerless. More on mages, 57 (201), 56 (198), 12 (17). And xxx 24 (82) and (84). Tales about snakes: viii 22 (61) and x 70 (137). Cham. plant seems pinethistle or black type (prob. Cardopatium corymbosum).

22. Plin. xxvi 9 (18–20). On mages he may draw on *Peri Magou* of Apion: Wellmann (10) 217; Messina (2) 25 f; BC ii 1 f.

23. Galen, *simples* 6 (xi 793 K); Delatte (6) 64, 90. Wellmann (6) and (7) shows lists of names of Greek, Latin, barbarian tongues in Diosk. were not in original but added under Empire; Pamphilos may be source. Note Plinius uses magi in wide sense to cover magicians of Arabia, Egypt etc. but must be largely dealing with mages proper. For Persian plant-beliefs, Carnoy HERE *sv Magic* 295 f; Wessely (3). Bolos not a forger: Kroll (4) 238.

Plinius may have used a Latin intermediary (?Valgius Rufus): BC i 119. Or may have drawn from Anaxilaos of Larissa, who drew from Bolos. This is unlikely but see Wellmann (1) 48 ff and (8) 148. Anaxilaos: F (1) i 222.

Date of Bolos: Kroll (4) 230 f; Wellmann (9) 5–16; Preisendanz RE xviii 1629, 22 (Ostanes) denies any rel. of Bolos and ps.-D.; Hammer-Jensen RE Suppl. Bd. iv 222–67 dates ps.-D. 5th c. A.D. (!). See also B. E. Perry; Hammer-J. (2); BC i 118; Jacoby FGH 263. F (i) i 22n6 sees the line as Bolos, Anaxilaos, an Egyptian artisan (?Phimeneus), then editor of P. Leyd; and B., Anax., J. Sextus Africanus, and editor of P. Holm. Anaxilaos: Cramer, *Astrol. in* R. *Law* 85 f.

STOKE-ON-TRENT CITY

24. AG 41–53; Comm. by Synesios, 57–69. Ps.D.: Lippmann (1) i 27–46; BC i 198–207. 210 f; F (i) i 224.

25. Matter of goldmaking: *hylē*, cf. Galen ix 494 with *hylē* as totality of medical matters.

26. F (1) i 197 and (2) iii 396 (326); Wellmann (9) 4; Röhr 77–86. Use of *theios*, Röhr 86–8.

Examples of *physika*: Ps.-Manethos, 2nd–1st c. BC; Nigidius Fig.; Demetrios *physikos*, Plin. viii 59; Apollodoros, Plin. xxiv 59, under Tiberius; Xenokrates of Aphrodisias, under Nero; Pamphilos, *Gepon.* xv 1, 6; HT with *Koiranides*, end of 1st c.; Polles of Aigai on sympathies-antipathies; Neptunalios, *physika*, c. 120; Aelius Promotus, *physika dynamera* (natural symp. remedies); Apollonios (Balinas of Arabs: seems A. of Tyana, CCAG vii 174 f, Thorndyke, *Hist. of M.* i 267, ii 234 f); agronomist Didymos, 3rd c.; veterinary Apsyrtos, 4th c., Syria, Caesarea; ps.-Aristotle, *Book of Things in Nature*, c. 600, Syria—of it, *Liber Aristotelis de lapidibus* is a part: Wellmann (1) 3 f; also work on animals by Timotheus of Gaza, under Anastasios I: Wellmann (4) 23 ff.

27. AG 57, 11 f; BC ii 313, 10.

28. AG 53, 16 f; MS 2327 f 258.

29. F (1) i 225; Lippmann (1) i 34 and 217; Diels (2) 128. *Klaudianos*, not a proper name, cited 11 times. B thinks a copper-lead alloy plus perhaps zinc, cf. *aes Claudianum* etc. But it is classified with minerals.

30. AG 26, 1; PGM vii 862.

31. Lakshmi: Goosens CE xxxiv 1942 321; Maiuri *le arti* Jan. 1939; Zanotti-Bianco JHS lix 227 f; Ippel, *Forsch.u.F.* xv 26 1936 325–7; *Arch. Anz.* 1939 370; GBA 1939 i 234; Wheeler (2) 135 etc.

32. AG 42, 2 ff; BC ii 317, AG, with 211–21, A3–7, for more texts on evocation of O.; Preisendanz (2); F (1) i 228 f. Evocation: Hopfner (3) and magic (1) ii par. 328–76. Stapleton (4) 29 n. 8 thinks the tale unknown to Zos. and thus later than A.D. 300, but such argument has little weight. Temple of Memphis (Ptah): in Synes. BC ii 313; Kees RE Memphis 678, 25 ff, citing Lucan vi 499 f; also B (2) ii 214, 14 (Hephesteia) and Book of Krates: B (3) iii 61 (no name); B (2) ii 26, 248; Kees 45.

Jesus: *Sayings of Our Lord* 1897, Frowde 12; *New Sayings* 1904 13. Dedicated quest: Nock (5) 107 ff; Loukian *Menippos*; tale of 3 proselytes (Goldfahn *Monats. f.G. u.Wiss d. Jud* xxii 1873 52; *Confessio* of Kyprian of Antioch (*Op.* 1758 1105); *Acta Sanct.* Sept vii 222; Loukian *Nigrinos*; Justin *dial.c. Tryph.* 2–8; vision of Mandoulis, Nock (6). In gen., F (1) i 45 ff, 309 ff.

33. F (2) i 16 (*Poim.* 27–30); Lewy 91 n. 2; R (1) 337, 20 and 365. Setheans, Hippol. v 19, 21 (W. 120, 25). Scott: "I inscribed in my memory" could mean "I set down in writing for myself," cf. Oxy. 1381, 166, after vision of Asklepios. Silence CH treatises x 5; xiii 2, vii 3; Porphyr. *de abs.* ii 34; Cumont AJA xxxvii 1933 263; O. Casel, etc.

34. F (2) i 27; *Poim.* 30; Iren. i 21, 5 (H. i 14, 4); *John* x 10, cf. prophet (Orig. *c.Cels.* vii 9). "Bearing *ta physika*" means bearing the holy things (of the mysteries).

35. F (1) i 332 f. The polemic seems interpolated; one of the few alchemic passages where word sympatheia is used; alchemists prefer syngeneia, or use marriage-imagery: Röhr 75 f; ps.-D. 51, 6; Kleo. 294, 28 etc. Diels (2) 131 notes we must translate "a nature", not "the nature". For Synes.: AG 57, 13; BC ii 312, A4a; Christian, AG 359, 9; BC ii 321 A8. In gen., Kopp 130; Diels (2) 131; Lagercrantz *P. Holm.* p. 110.

36. 428, 15; F (1) i 253.

37. B (3) iii 57; BC ii 320, A7.

38. Stapleton (2) 135, MS of Rampur; cf. Ruska (10) i 205 with n. 2.

39. JL (1) 149 and 187 f. Apollobex: BC ii 13 n. 19; 15 n. 3; 309. Also Reiss RE i 2847, 39.



40. R (1) 163 n. 4; Wellmann (10) 68 (55) B300, 13 p. 217; and (9) 15 n. 8; also (11) 12 f n. 6; 14 n. 7. I *Kings* iv 27 (31); Jos. *Ant. Jud.* viii 2, 5 (43); Fulgent. (*Mythog. lat.* 141) says D. published a magical treatise *Dynamera*.

41. Dardanos: next chapter for Sword. Also BC ii 15, B3; 288 line 17; R (1) 163 n. 4; Wellmann RE iv 2189; Wunsch; Delatte *mus. belge* xvii 1914 no 26 p. 64; Hubert, *Dict. Antiq., Magia* 1504b. Also, Col. x 357 ff; Dieterich (3) 4 f; Apul. *apolog.* xl; BC ii 289 n. 5; Tertul. *de anima* lv 5.

42. St Gall: Boll (3) 137; BC ii 14 n. 22.

43. AG 2220, 8; and BC ii 308 (PGM i p. 135).

44. *Apotelesmat.* v (93, 1832 ed.); B (1) 38; Steele 4. Iambl. *de myst.* i 2, cf. viii 5.

45. *Ant. Jud.* i 2, 8.

46. Fabric. *cod.* ps.-VT 1713 147 ff; CCAG ii 182, 26; v 1, 118 n. 1; v 3, 136, 13 and 140, 1; vii 87, 3; viii 1, 160. *Apoc. Mosis* (Tischendorf) 19; Joel, *chron.* (Bekker) 34; BC i 45. Seth as founder of astronomy, Malalas, 5, 20 (Bonn): Kühn in *Festg. R.v.Roth.* 1893 219.

47. CCAG viii 4, 102 f. Seth as Zoroaster: Bousset (3) 381, 2: Windisch (2) 24. Sethean gnostics: BC i 46; influenced by Iranian dualism: Bousset (3) 119 f and 378.

48. BC i 46 and 53; ii 118–20. They wait age on age in grotto of Mt of Victory for the Star. *Matth.* 1–11 on mages; Messina (3); BC i 51. Zoroaster christianised by gnostics BC i 54; attacks on mages, 55.

49. Lippmann (3) 24; Horten 66; Edrisi, *Geog.* (Jaubert 1836) i 125.

50. Ahmun: Sigge, *Islam* xxiv 1937 287 and 299; Lippmann (3) 24 f also for Bailak of Cairo (13th c.) and Ibn Battata (14th). Psellos: Ruska (2) 61 f and 155 ff; Lippmann (1) ii 207; BC ii 309 f; CMAG vi 32, 15 ff. Arabs: F (1) i 321 f; Ruska (2) 73–9; 109; 113 f and 181; 138 f. Krates B (3) iii 44–75. Book hidden in cave or chamber, oft with motive of revealing god or angel: *Picatrix* (Ritter p. 27–9; M. Plessner; R (7) 113, told by Hermes, cf. R (7). Balinas on Talismans; MS of *Treasure of Alexander*; discovery of book, *Secret of Creation*, in secret chamber.

51. *Numa*, near end; Delatte, *Bull. ac. r. belge CL* Feb. 1936; R (11); Ruska (2) 52. Discovery in Egypt of old books: CCAG vii 4, 102 f; Kroll RE sv HT 794, 22 ff and 802, 29; Roussel BCR 1929 143.

52. Erman (5); Lexa ii 231.

53. JL (1) 4 of; Paus. viii 15, 1 f. Arkadia was an area where rites could survive directly from Myk. world.

Some more details on *stelai* etc. Doresse 188–90, *A Revelation by Dositheos on the 3 Stēlai of Seth*. (A Dositheos was said to be master of Simon Magos; Philastros cites a D. on his catalogue of heresies, straight after Setheans: Puech (2) 124 n. 6). *Stēlographiai*: AG 264, 19; BC ii 331 (9).

Note the conflict of Seth and Hermes: Doresse 190 and 107. Synkellos hands over to Hermes the *stēlai* of Seth: Scott iii 391; Doresse (4) 62.

Clearly much of the mystery about *stēlai* etc. grew from broodings over the hieroglyphs which men could not read: Sbordone (1) intro. and F (1) i 278 n. 3.

## VI. MORE ON BOLOS

1. AG 167, 20 ff. F (1) i 233 f argues these chapters are only an extract from a work by Zos. Also Mark f141v–161v; here f149v. Our Lead: 49, 1. Primary matter: 52, 6 f and Lippmann (1) i 34 f. Bits of *P. & M.* in *Turba*: Ruska 275.

2. Book of the Sanctuary cited as source of recipes for making emeralds and hyakinths: 2325 f160 v and 2327 f147. In general: Forbes (1) i 136.

3. Leyd. Pap. 1347/x 112; Lexa ii 57. Apepi: 8–13; Lexa ii 98.

4. B (1) 31. *Īōsis* T (2) 133; A. J. Hopkins (5); T (1) 49.

5. JL (1) 210 f and 57; Attis: Delcourt (1) 32. Herakleides speaks of the empyromantis of the Iamides, so they were closely connected with fire: Schol. Pind. *Ol.*

vi 119 (i 180 Drach.) and Hepding RE *Iamos* 687, 33. The white ios is said to be the gillyflower; the dark, the violet. The violet is often linked with Persephone's rape and blood, cf. what said of the pomegranate above. Arist. *Ausc. mirab.* 82; Diod. v 3; Athen. xv 684c; Ovid *met.* v 394; against, Pamphōs in Paus. ix 31, 9. Violets and *pothos* connected with funerals: Halliday's note to *h. Hom. Cer.* 8 (p. 130).

Note also link of ios with Iōn, to whom it was given by Ioniad nymphs: Nikandr. *On Farming*, Athen. xv 681, also 683ab. Iamides: Strab. 356; Paus. vi 22, 7.

6. Stephanos: 215, 30 (Idelar); AG 136, 10. For separation: Plato, *Phaid.* 64c Krates B (3) iii 52 with refs. n. 3.

Difficulties: T (1) 56 notes that conversion of copper and other metals into black sulphides accounts for blackening; smelting to a yellow metal for yellowing. Whitening is harder to explain. If black product was dried before smelting, it might be whitened as effect of efflorescence of salts derived from the Divine Water. Or some white material (compounds of mercury, arsenic, or antimony) may have been added.

7. Anon: AG 219, 135 f, cf. 199, 1. Zos: 215, 8. Ibn Umail: Stapleton (5) 74 f. Pibechios on whitening etc.: AG 220, 8.

8. AG 55, 13–18; BC i 201, 210 f.

9. XXVIII 29 (112–18); also x (137); goes on to bramble-toad.

10. AG x 12. *Geponika*; cf. *Gep.* xix 9 etc.

11. F (1) i 234 f and DL i 10 (Egypt).

12. AG 47, 2.

13. F (1) i 236. Also 48, 4; 48, 16; 49, 2. *Elydrion*: P. Holm. xi 16; Leyd. x 68: AG 48, 1. Paul. Aig., medical writer 7th c., iii 2.

14. *Ibid*; AG 51, 6.

15. AG 51, 11. Not crackle, *trizein—i.e.* hardens; tin leaf crackles as it chills, cf. 161, 8. Geber mentions the Greeks raised the question of getting rid of tin's noises: B (1) 230.

16. AG 150, 4; F (1) i 237.

17. Papyrus: Nock (2); PMG iv 1716–44 (Teubner 126); R (2) 19 ff and 80 ff; Wessely, *Denks. d.k. Ak.d. Wiss. PH Kl.* xxxvi 2, 1888.

Gem: Mouterde (1) and (2); cf. Derchain (2) no 322 for the riding..

18. *Syrigmos*: R (2) 82; Pap. Leyd. W vii 27. In general: Dieterich (2) 190; O. Weinreich (2) 345; Hopfner (1) i par. 780 (p. 201). See Pythag. of Rhodes in Euseb. *pr. ev.* v 8, 1 f (Hopfner 203).

19. De Ridder: *Cat. Coll. de Clerq* vii 2, 3474 (p. 781). A word like *aspasmos* understood.

20. Mouterde (1) 58; De Ridder vii 2, 3474. On right Aphrodite holds mirror; rings marked on ankles.

Other refs. for Eros and Psyche kissing, Mouterde 58 n. 4, with unintelligible formulas, *e.g.* intaglios showing link of Mithraic cult with magic: Delatte, *Mus. belge* xviii 1914 5–20; R (13) 52 n. 2; Fabretti, *Synt. Inscr.* 531, 14. Abraxas (Coll. Fabretti), scene with no legend: Montfaucon ii, 2nd pt., pl. ccxii (1). On right here a winged god like one of the *pantheoi*: Hopfner (1) i fig. 21 f (pp. 214 f); Budge (5) 132 f.

21. Aphrodite also found on magic Syrian stones standing naked and doing hair: de Ridder, vii 2, 3473, 780, *Anōriphrasis*. Also on back of lion with drapery rolled round right leg, hands lifted to falling tresses, *ib.* vii 1, 1169 (p. 192): *Sabathianadia Iaō Sabaōth Aiōn*.

22. Mouterde (1) 59; Nock (2) 154 n. 3; Cook ii 2, 1047 fig. 902; Kekule *Terrakotten v. Sizilien* xlvi; Laborde *Vases Yambert* i 47; S. Reinach *Rep. Vases* ii 191; R (13) 52. Burnings: Derchain (2) nos 323–4; tree, 324; pillar, 328; butterfly, 325 f. For embrace of lovers, no 329, "Reciprocal Love of my Soul." From Tarsos.

23. Delatte (10) 82–6 for gem with inscr. *Nicharoplēx*, assoc. with solar god; Love alone or Love with Psyche. Cf. a second pap. Nock (2) 157 f. Chald. oracles: Lewy (2) 95, 126–9, 122; Psell. *comm.* 1141c (K. 47); BC i 159.



24. Syn., AG 59, 6; Sophe, 211, 13. Stapleton (4) 35 says of Arabs, "Jamasp informs Ardashir that, owing to their possession of the Secret, 'the Sages are preserved from poverty and hunger.' " See also 34.

Hopkins (3) 42, 49; Read 13 f. For Egyptian *lapidum tictores*: *Liber Hermetis* 83, 24; Cumont (1) 96 n. 3; Lippmann (1) i 277 f; Hopkins (6).

25. Diels (2) 131.

26. Forbes (1) i 138; Euseb. *chron.* Olymp. 188; Iren. i 13, 1; Epiph. *adv. haer.* i 3; *haer.* 14 (i 132, Colon 1682). Plin. xix 4; xxv 95; xxviii 49; xxxii 52; xxxv 50.

27. Pfister (1); Reinking. Koptic MS, Berlin 8316. Tinting: MS 2327 f223; Stephanos, *ib.* f64; Ps. Demok. *ib.* 118—cf. 15. See also Cayley, J. *Chem. Educ.* iii 1936 1149 and 1937 4979; J. M. Stillman 80

28. MS 2317 f21; B (1) 161f. Pap. Leyd. x (101 recipes) & P. Holm. (152) were found in the same tomb with 2 magic pap. (xii–xiii of Preis.); xiii and the two first are in the same firm hand; not rolls, but books. Date mid-3rd c. (Reuvens, Leemans); c. 300 (Lagercrantz); first quarter 4th. c. (Preis.). P. Holm. twice mentions Afrikanos (Sextus Afr. A.D. 2c). also Demok. & Anaxilaos; has 9 recipes on metals, 72 on precious stones & pearls, 70 on stuffs.

29. F (1) i 220 f; P. Holm. iota-zeta 28; P. Leyd. i 10, 9. Isis to H.: F (1) 259. Lagercrantz, P. Holm. p. 143. Terms: Lippmann (1) i 11, 325 f; ii 69 *sv Decknamen*. P. Leyd. v = PGM xii 401 ff.

30. AG x 12; Plin. xxviii 29 (118).

31. Sat. 88. For D.'s theory of Nile floods, Diod. i 39; JL (5) 35. Barbaroi: BC i 240–2.

32. K. Reinhardt 479 f; Delatte (7) 25 ff (spectral emanations). Windischmann, *Zoroast. Stud.* 1863 288 thinks eidola are the Fravashi *zu materialistisch Aufgefesst*; but this is not likely. Herakleides seems to have criticised D.'s theory: DL v 87 "Of Nature. Of *Eidola*. Against Demokritos." Zeller, *Ph. Gr.* iii (4th ed.) 1038 nn 3–4. In *Placita* of Aetius, D. is joined with Herakleides and Empedokles: iv 9, 6 (Diels 397).

33. Demetr. xlviii; *rhet. gr.* (Spengel 1856) iii 278; Stamford (1) 58; Wellesc 147 f. Papyri: Leemans PG ii 1885 56 n. 1 (p. 17 lines 28–31; p. 14 lines 31–6); Wellesc 146. In general: F. Cabriol, *Dict. Ant. Chrét. et Liturgie* 1907 i 1268–88; iii 264 f; Dornseff 35 ff.

34. Ruelle (2) & (3); Poirée; A. Gastoué, *Bull. musicol.* i 1907 24–31; H. Leclerq DACL i 1268 ff (Gnostics); (B (2) ii 219, 434; G. Reese, *Music in Middle Ages* 1940 85 f; K. Wachsmann, *Unt. z. vorgreg. Gesang* 1935 24–34.

35. C. Jan. *Mus. Sc. Gr.* 176 f; also D'Ooge, *Nicomachos, Intro. to Arithmetic* i 6, 189 f. Eudoxos: Santillana; Wassenstein 90.

36. Jan 241; Ruelle (1) Iren. *adv. haer.* i 14 (PG vii 610). Lewy (2) 397 on Mesodemes and Silence as first *arche* of Pythags.

37. Excerpta MSG 277, 6.

38. *Sigē*: PGM ii 193, 34; Wellesc 145. Dornseff, *Stoicheia* vii 1922 33. Archytas took music of spheres not accessible to our senses: Diels *vors*, i 23, 330 Cornford on *Tim.* 72; D'Ooge 98, Examination of melodic structures of exs. from P. Leyd. and P. Berl. show one set meant for amulets, one for invocations: Wellesc 140 f. The *melesmata* are not based in any Jewish, Syriac or Greek musical system; so Ruelles' idea does not work. Papyrus: Oxy. 2728.

39. Rev. i 8; Stamford (1) 82 and (2) 43 f. Add 7 Pleiads and Hebrew Tetragrammata for God, 7 archangels: RE *sv Hebdomas* (2); Cabriol i 56–8; Barb 111; Dornseff 11 ff, 35 ff, 82 ff; London P. 46 (Kenyon 66, 24) cited Dornseff 47 f.

Numerical calculations also; Holy Ghost as Dove, *Peristera*, at Christ's Baptism = 801 = Alpha Omega. So "I am the A & O" = "I am the Trinity": Contenau (1) Gems: Bonner (1) 186 f; Matter iii pl. 2A, 6.

40. Standford 82. See him also on the law of "increasing numbers" and rhopalic lines. Mute prayers: BC i 47.

41. Stamford 82 and 11–3.

42. Stoics etc.: Grube, *The Greek and R. Critics* 1965; P. de Lacy, AJP lxix 1948 241 & 71 lx 1939 85–92.

43. Dionysios, i 66, 16 & xii 134, 9, cf. xi 124, 25; Long. *sublime* xxxix; Stamford 17. Note also the writing of sigma-less poems.

## VII: OSTANES

1. DL ix 34; BC i 168 nn 1–2. Against narrow Hellenism: DL i 9; BC i 165 f; Empedokles and Persians, BC i 238–40; Hekataios and Demok. on Jews, 240–2; Aristoxenos and mages, 242–4. *Diaphora*: Lagercrantz (2) 113 ff.

2. Plin. xxx 8 etc.; BC i 168 ff. Heptathongos: Porphyr. *de phil. ex or. haur.* i (138 Wolf): Euseb. *pr. ev.* v 14; BC ii 284 (11), also i 175–7. Various O.'s: BC ii 268 n. 3a: DL Pr. 2; *Souda sv*; BC i 172 n. 5; Kopp i (1869) 407 ff; Lippmann (1) 66; Priesendanz(2); Wellmann (1) 15 n. 1; B. ii 318 6, & n. 9, also 14n. 26; Plin. xxx 11.

3. Plin. xxviii 70 (261); Wellmann (1) 78. Cf. recipes, ib. 19 (69) on not exposing self when urinating to sun or moon, or letting drops fall on anyone's shadow; O. says let one's morning piss fall on foot as protection against magic potions: cf. Amm. Marc. xxiii 6, 79; DL viii 1, 17 (Pythags.); Joseph. BJ ii 8, 9 (148), Essenenes—queried Wellmann (*Abh. Pruss. Ak.* 1928 fasc. 7, p. f. 7) but correct; H. Brunnhofer, *Ar. Urzeit* 1910 324 ff, cf. Hdt. i 133; Plin. xxx 17; Cumont TMM i 105 n. 4; BC i 297 f. How to disgust women with love: Plin. xxviii 77 (2560 cf. xxx 24 (82) and xxxii 18 (49). See also xxxii 38 (115 f). For Plin. and sources: BC i 171–3.

4. Plin. xx 2 (8 ff).

5. Plin. xxxviii 2 (4 ff); goes on to other writers with barbarian recipes. Diels *vors.* (68) 55B 300, 13a, attributes to Bolos. Xenokrates, a physician, wrote a treatise with such recipes (human bodies for materials), see Galen, *simples* x i (xii 248 K.). O. and *Oktateuchos*, BC i 173; O. as descendant of Zoroaster, 175 f.

6. BC. i 188 f.

7. BC ii 293 (16): *orat. ad Gr.* xvi (18, 3 Schwartz). BC i 189 n. 1; ii 295 n. 2. Note recipe of O. linking coral with peony and root of solanum. Similarities of works attrib. to O. and Z., BC i 114 ff.

8. BC i 189; Wellmann RE *Diosk.* 1138, 63; 1139, 20; *Hermes* xxxiii 360 ff; BC i 116.

9. BC i 190 with refs.

10. BC i 191. *Iatrika* of Aetios of Amida (6th c. A.D.) ii: some MSS give extracts from a book on Stones by Diogenes (? Demosthenes), which Wellmann thought might be a corruption for Ostanes, then for Demokritos. Aet. ii 30 & 32; Rose 482; BC ii 303 & 482; Wellmann (10) 68 (55) B300, 12 (11 216 n.) & (3) 90.; V. Rose 484 ff. Change of mind; Wellmann (8) 131.

11. Wellmann (8) 139 ff, and RE *Evax*. Orphic: Hopfner RE Lithika 765, 42 & (1) i par. 554; ed. Mély 137 ff. Wirbelauer 42 ff. Aetios: V. Rose; Wellmann *l.c. Synoichites*: Plin. xxxvii (192); Wellmann RE *Evax*.

12. BC ii 304, 6 ff. Damigeron, original, may have drawn on lapidaries of Chaldeans, Soudines and Zachalias. For Psellos & Mēlitēniotēs (Byz. poet, 13th–14th c.) and connection with Damigeron: BC i 129 & 193; Wellmann (8) 88, 104, 107; Wirbelauer.

13. Arnob. *adv. gent.* i 43 (4th c.).

14. BC i 5–7. Xanthos prob. took name *Zarathustra* via west Iranian form **Zarahustra*; the second half suggested *aster* (star), so provided fanciful etymologies. Ps.-Clem. breaks as *Zō(sa) rho(ē) asteros*: BC i 44. Paus. v 27, 5 & vii 6, 6; Tac. *ann.* iii 62.

15. Dionys., schol. Hdt. iii 61; Schwartz RE *Dionysios* no 112, col. 934. Pedion: Strab. xiii 4, 13; village, RE iv 2212. Anaitis: RE *Anaitis* 2030, 33; Buresch, *Aus Lydien* 66 ff; Kiel & v. Premerstein, *Zweite Reise in Lydien* 89 no. 178; 100 no. 197.



16. Picard *Ephèse et Claros* 1922 130 ff, 164 ff. Pergamon: Birt, *Ph. Woch.* 1932 159–66; perhaps cults here and at Ephesos went back to Achaimenids and were developed by Stoicising Attalids. Relief: Cumont (12) 4th ed. 135, fig. 10; 275 n. 29.

17. G. Thomson (1) 134 f, also ch. xiii. Wheelwright fr. 72.

18. Cherniss (1) 331; further (1) and (2). Wheelwright 121–5.

19. Wheelwright fr. 30–2 & 35, with pp. 43 f: W. Kirk 356 (both on fire in general and on celestial fire); dox. 275, 2. For H. and mages: L. Stella. Oracle: Lewy (2) 132.

20. Refs. etc., BC i ch. 1. For Er: Bignone (1); Bidez (7) 273 ff & (8) 257 ff. Aristotle: Bignone ii 84, 342 & BC i 16; also F (1) ii ch. viii.

Image of World as Temple: Aristotle, F (1) ii 233–8; Kleanthes, Bywater 79; Bernays, *Die Dialoge* 166 f; Manilius i 20–4. See also here ch. xii n. 29; xix n. 1.

This leads into the idea of the World as a City, ult. from Zenon with his teaching that there was no need to build temples as the Cosmos in its wholeness is the substance of God. Chrysippos compares to a City; Poseidonios takes up: DL vii 138; Stob. SVF ii 527. Alexandros (bro. of Kassandros gov. of Makedonia 316–298) was given land on peninsula of Athos and founded (after 316) city of Ouranopolis (on site of *Sanē*); inhabitants, Ouranides, with Zeus Ouranidōn and image of Aphrodite Ourania. Cf. Cic. *nat. deor.* ii 31, 78; 62, 154 (SVF ii 1127 & 1131); Areios Did., SVF ii 528. Also Cic. *de fin.* iii 19, 64 (SVF iii 333); *de leg.* i 7,22f (SVF iii 334); *de rep.* i 19 (SVF iii 338). Adam as Kosmopolis, Philon *de op. m.* 142–4 (i 50, 2 C.); cf. *Op.* 19, 143; *Jos.* 29; *Mos.* ii 51 (12). Cosmos as Magalopolis: *de spec. leg.* i 33–6 (SVF ii 1010, 3 etc. Dion. Chrys. *Or.* xxxvi 22 f; Sen. *ad Marciam* 18, 1.

21. Bidez (5) 256 ff & (6) 81 & 83; Cumont (9) 69; Wetter 101 ff. No Greek versions of the sacred lit. of Mazdeans till Alexander: BC i 57.

22. Proklos *in remp.* ii 122 ff & 114 ff (Kroll); Hirzel i 334 & 309 n. 3. *Axioch.* 371a; Cumont; Ganschinetz (4) 2415 ff. Tale of mage Gobryes sent to save Delos from pillage as the natal isle of Apollo. There is still a strong tendency of classical scholars to make Greek culture "autonomous," see Merlan (2) on Noumenios and on daimons, 34–6; contrast Dodds (3).

23. Zeller, *Ph. d. Gr.* iii 10 A; t. 1038; RE viii 476, 16; BC i 15.

24. Augustine, *civ. dei* xxii 28; *Menippos* vi and at the start.

25. BC i 34–6. New names: Zaratos, Zaratas, Zarades. This Babylonian character grew so different from the Persian Z. that some writers postulated two prophets; there were expansions, links, fusions, localisations. Priests at Hierapolis (Mabbug) annexed Z. and set in forests around there the place where he had been in retreat; a demon was shut in well by Z. getting the goddess Simi pour seawater in, etc.

26. Strab. xv 3, 15.

27. Paus. v 27, 5.

28. Ep. 258; Cumont MMM i 10 n. 3. Much variety in scattered groups: Plout. *de is.* 45–7; *de latenter viv.* 6 (1130a).

29. Schaeder *Urform.* 140 ff; BC i 69. Triad in Chaldean oracles: Lewy (2) 147; 417 ff.

30. BC i 69–71; dualism (fire and water), R (10) 70 & 75, cf. Hippolyt. *ref.* i 2, 12–5; R. 74 n. 5; Diels *vors* 38 (62) A 3 & 5; 60 (47) A8; Lagercrantz (3) 401 & 411 f; Stapleton (7) 134. Oxy. contract, P. Oxy. 2722; "Beloved," Roscher v 888.

31. BC ii 205; later compilation 323; 351, 9. Ostanes seems to know processes that his follower Maria the Jewess perfectioned so as to give gems phosphorescence; the Demok. provenance here is not sure. Ruska in Lippmann (1) ii 87; B ii 424, 13 & i 205.

32. BC ii 313 f & 58, 12; "metals coloured by means of watery simple varnish or quite superficial alloying," B (2) iii 61 n. 3 and i 59 ff. Leukipp., B. *intro.* 201 f; AG 53, 18 (badly edited) & 55, 22. Also Reiss (4) 1344, 36 ff.

33. BC ii 315 n. 6; AG 61, 5–9. "And that you may wonder at the man's wisdom, look how he had two catalogues drawn up." Also Lagercrantz, *Holm.* p. 109. Tannery, *Mém. Scient.* ix 147 ff; Ruska (8).

34. B (3) iii 105. Ruska (2) 51 ff shows it from Greek, like *Book of Krates*. See also Blochet 106.

35. Synesios: BC ii 316 A5 n. 3; AG 59, 4; 61, 17; 67, 23; 122, 65; 58, 19.

36. B (3) ii 326; BC ii 315.

37. AG 59; 122; 67. Kedren. 213 (Bonn) cf. Firm. Mat. *Math.* vii 1, 2. Porphyr. *in remp.* ii 105, 23–5; 107, 5–7 & 14–23; he insists that men must think in images.

38. BC ii 334 ff; AG 261 ff. Note fire is *athikton*, not to be touched, virgin: ? Iranian. BC ii 336 n. 6.

39. Olympos: MMM ii 36 n. 1.

40. Refs. BC i 208 f. He appears in a lexikon and 2 lists of goldmakers, and is called King of Armenia in title of a treatise: B (2) i 69; CMAG i 41.

41. B (3) ii 239 n. 1 & 259; Lippmann (1) 68; Cumont (11) 272 f; AG 35, 10; BC ii 315 A5a. Success: Kopp (1869) 433, 353 n. 30; Hoefer i 274.

42. BC ii 345–7; B (3) iii 13 ff & Intro 216 ff; Blochet 101–3. The ref. to Andalusia shows late additions; the author cites the *Almagest* of Ptol.

43. Krates: B (3) iii 72 f.

44. Plin. xxxvi 21 (149–51); BC ii 201; B. intro. 234. Found in street: cf. Theophrastos: Browne (1) 23 f. Avicenna, "It is found in the dirt of streets and is trodden underfoot by men." Ibn Umail: Stapleton (5) 75.

45. Balti, Belati (Lat. Baltis) Our Lady in Syriac, identified with planet Venus, RE *sv* ii 2842; BC ii 116 f.

46. B (3) 119–23; BC ii 347–52; Blochet 103 n. 6. For HT: R (11) 35. Ishtar: Kroll (1) 206 ff.

47. BC i 40; Gottheil 35; Theodore bar Konai *Livre des Scholies*, BC ii 103 f, who says Zor. was Jewish but set out teachings in 7 languages: Greek, Hebrew, Hyrkanian, of Merv, Zarnaq (Zrang, cap. of Seistan), Persian, of Sagastan: BC ii 132 f.

48. Manget i 513b; BC ii 328, *Interrog. regis Calid et resp. Morieni*. Arsicanus seems Ostanes. Ruska (4) i 44.

49. Agathodaimon: Ganschinietz (4) 2395, 61. For Hermes: Zos. in AG 109 & 115 ff; Ruska (4) i 17 ff. Urine: B (3) 138 n. 89. Blochet 105 f: The strange beast is the creation of the alchemists who have put all their wisdom in it: 4 faces each with 40 tongues, and one of them said that in heaven's sphere are 360 degrees, in a year 360 days, so each degree corresponds to a day.

50. Stapleton (2) 68-73; (4) 34.

51. AG 341 f; B (3) ii 320 f; R (10) 35.

52. Jastrow, *Die Relig. Babyl.* i 351; Dhorme, *Relig. assyro-bab.* 1910 272 ff; Porphyr. *de abs.* ii 27. CRAI 1931 22 ff; Carcopino RHR cvi 1932 592 ff; Eissfeldt, *Molk als Opferbegriff* 1935 (Beit. z.Rel. d.Alt., 3 Halle); Guey, *Mél. Ec. Rome* lvii 1937 88 ff.

53. B (3) ii 309; BC ii 336–41.

54. Preisigke NB: Pbekios, Pbekis, Pibechis, Pibiches. The name P. here shows the source of the text was Greek. Paris Mag. P.: R (11) 33 n. 2 & 36. Jealousy, cf. BC ii 337 & 309, with n. 3. Philosopher as doctor of occult sciences: Cumont (1) 122. Psellos (11th c.) calls Pib. a pupil of Ostanes: BC ii 308 f with notes. Ps. says he "covered with shadow" the mysteries, that is, veiled them.

55. R (1) 363 & 104, 10; BC ii 270 fr. 6 where O. is called the Roumi. D. to L.: AG 53; Diels *vors.* 68 (55) B300, 18. Kings: Reiss (4) 1344, 31 ff, who compares Zos (AG 239 f). Diels notes traces of Ionian forms in his letter. *Crown*, a particular work, not a coll. as R (1) 363 takes; cf. work of Geber, B (3) ii p. xxxviii n. 3.

56. H. G. G. Herklots, *How the Bible came to us*, 1959, 109. *Letter of Aristeas*, 1917, (H. St. J. Thackeray) prob. 150–100 B.C.

57. Cumont (10); Par. 2419 f46v; AG 26, cf. B (3) ii 319.

58. Porph. *phil. ex or. haur.* i (138 Wolff: Euseb. *pr. ev.* v 14); BC ii 284–6 (11) for rel. to Heptathongos etc. Also Nichomachos: BC ii 283 (10). For Christian rels. of O. to angels, BC ii 289 ff.

59. *Koir.* 3, 6 Ruelle (Mély ii); BC ii 315 n. 8; Cumont (1) 154 n. 3; HTR xxvi 152 ff.



60. Zos. AG 129; Stapleton (4) 35.

61. Hermippos wrote *On the Mages*: F (1) 43. Zoroaster had work *On Nature*, a lapidary, books of astrology, also alchemy: BC i 131–52.

62. AG 229, 16 ff; BC ii 243; F (1) i 266 f & (14) 125 f.

## VIII: HERMES TRISMEGISTOS

1. CMAG vi 1928 44; BC ii 309 f. Text goes on, "For one sees at once that the names he gives to the art's practises are mostly unknown, *e.g. samari, phaktiton, plakōton.*" *Phaktiton* seems Latin, *factitius*.

Steph. cites *Kleidion* of Hermes: Ideler iii 212, cf De Falco *riv. di filol.* 1936 379; AG 281, 15 ff & 19; Ruska (2) 17 & 56, 29; Kroll viii 799, 33 & 795, 5 ff; Dieterich (2) 71. Firmicus: *Math.* iii 1, 1 (Kroll i 91, cg 196, 22), mentions an Hanubius, depositary of Hermes' secrets, cf. CCAG ii 159 & 202 ff; RE *sv Annubion* (Anubion) & suppl. i sv. But this is possibly only an astrologer.

2. F (5) 48. *Wisdom* vii 17–21. In a Gnostic sort of way, Wisdom is made the first creature of Yahweh, before the cosmos; Wisdom is seen as man's quest. Philon supplanted *Sophia* with *Logos*.

3. Klaros, K. Bursch 1889; Porphyr. *phil ex or. haur.* (G. Wolff 1856). Forgeries: *Orac. Chald.*, Kroll (3); Dodds (2).

4. KK (CH xxiii) 3 f.

5. Dreams: Boyancé (3). Magic: Hopfner (1) ii par. 162 ff. Theurgy: Iambl. de myst. iii 2 f. Exs.: *Poimandres*; Oxy. 1381 (Imothes appears); Preis. SB 4127 = Nock HTR xxx 61 ff. Christians: *Pastor of Hermas*; *Passio Perpetuae* iv 2 ff, vii 2 ff, x i, xi–xiv. Gnostic: Iren. i 14, i (M.) = i 127 ff Harv. (Tetrad appears to Markos); Hippol. vi 43 (Logos to Valent.); ix 3 (vision of Elchasai); *Evang. Petri* v 40 etc.

6. KK 5 (Scott i 386, 20). CF. what said above of *stēlai*, e.g. that of Hephaistiaion of Memphis; Isis' Aretologies (Peck 193); CCAG viii 4 (p. 102) etc.

7. *Phileb.* 18b; *Phaidr.* 274c–e, 275c. He also calls the god Ammon.

8. Diod. i 16.

9. *Souida, sv Phaunos;* Tert. *adv. valent.* xva; Iamb. *de myst.* viii 1–2; Galen *adv. ea quae in Jul.* In general, B (1) 133. Olymp. "The ancients had the habit of hiding the truth, of veiling and obscuring by allegories what is clear and evident for all the world," B (1) 193. Originally Greeks had 3 Seasons; later Autumn was added.

10. Boylan 60; Breasted (1) 17.

11. Boylan 60 n. 4; Naville *Horus Myth*; sunboat, Boylan 58–61. Staff, ib. ch. 13; Magic, 124–35.

12. KK vii & lxvi.

13. We know a priest there of the name: Sethe (1) 8 f; Brugsch *thes.* v 866 f; Mallet *Nasr-el-Agouz*. Temple: Otto: 135 f.

14. Clem. *strom.* i 21, 134 (p. 399); Sethe (1) 6 ff; Griffith (1) 4; Brugsch WB 1221; JEA April 1923 127. R (1) 118 f refuses accept identity of Theban Hermes and Teos-p-hb of texts.

15. R (1) 120 f; Boylan 167 f. Advents: CCAG viii (4) 181, 20; 257 n. 1.

16. G. R. Hughes (1) and (2); also for Oserapis and Anubis. Request for birth of child, with conditional vow to Amenophis son of Hapu, on wooden tablet, Malinine, cf. Gardiner (2) i pl. 50, 2. In general Gardiner (1) & (2) i pl. 80; Simpson.

17. Hughes (1) 179; Edwards i, xxii; Thompson JEA 1941 77; Volten 107; P. Berl. 8345, 2. 1 & 4. 15, also 4. 10; Thompson PSBA xxxiv 1912 227–33. Sentence: P. Insinger 8, 19; Volten (2) 78 f.

18. Hughes 179; JNES xvii 9 n. j; P. Or. Inst. 19422/3.

19. A. Klasens, *Magical Statue Base* (*Socle Béhague*) *in Mus. of Ant. Leiden*, 1952.

20. Skeat 208 for refs.

21. Only previous proof for oracles of Thoth-Hermes was P. Paris 1, with astron. pap. Skeat 205 & 208.

22. Diod. xxxi, frags. 15a; 17c. Skeat 207 for discussion of 2nd fr. and P. Tebt. 5, 153n, and of exclusion of Panop. from amnesty 118 B.C.

23. Erman (7) 25; Neugebauer (2) i 85.

24. Kazarow RE xv 222; Roeder (1) 171.

25. Kruse RE Va 1076; Eitrem viii 698 & 706 ff; Trismegas in PGM vii 551 (Gordian 238–44). For older view: Weber *Archiv f. Relig.* 1934 xxi 173. A theosophic work (Delatte, *Anec. Ath.* 1927 331, 10–32) names a Hodōn the Trismegistos whose doctrine is Christian. He seems a Byz. imitator. Form: Great God HT in *Or. Gr. Inscr.* 716, 1, shows T had become a proper name. For play on 1 and 3: Martial v 24, cf. CH xvi 3.

26. Synk. 72; Loeb Manethos 209; F (2) iii p. clxiii; Scott iii 492 f; R (1) 139; Hopfner *fontes* 74. Seriadic: Joseph. JA i 71; R (1) 183; JL (5) ch. iv.

27. Seshat: Erman (2) 396 f & (1) 56 f; Lepsius *denk.* iii 169; Laqueur. Celsus: Wellmann (5); MS has *emmanetos*.

28. *Asclep.* xxxvii.

29. *Strom.* liv 6, 4; no proof that Books of Thoth were in temples under Pharaohs: F (1) i 76, despite e.g. Book of Dead ch. 64.

30. Ghalioungui 32.

31. Horap. i 38 (Sbord. (1) 85), also Roeder RE viii 2316. Magic *prestigiae*, Lauth; also F (1) i 124. Paul: 2 *Tim.* 3, 8 & *Exod.* 7, 8. Plin. xxx 3 ff (Mayhoff iv 420 ff); BC ii 14 n. 23. Noumenos (Euseb. *pr. ev.* ix 8; Leemans fr. 18); Origen *C. Cels.* iv 51. Talmud: Ganschinietz RE *Jannes*; Schurer *Gesch. Jud. Volks* iii (3rd ed.) 292; Cumont RHR cxiv 1936 19 ff; Apuleius *apol.* xl (Helm 100, 9); Plin.: Messina (2) 25.

32. Lexa ii 129–34 & i 158; demotic spellbook of Lond. & Leyd. 6, 1 to 8, 11, cf. ib. 17, 1–21; Lexa ii 124 f. Also 16, 1–14 (Lexa ii 122 f): after many names, "Tat Tat bring Boel (thrice). Tagrtat eternal, bring Boel (thrice) . . ."

33. P. Anastasi no. 574 3R 23–8, 32–8; Lexa ii 157.

34. Kopt formula from Greek spellbook of Paris, 2 R 33, 3L to 7: Lexa ii 155 f. Texts: Erman, *Z. f. äg. Spr.* xxi 1883; Wessely *Gr. Zauberpap. Paris u. Lond.* 1888 (Denks. d. k. Ak. d. Wiss., Vienna xxxvi); F. L. Griffith *Z. f. äg. Spr.* xxxix 1901.

35. Lexa i 160; Mag. pap. Leyd. i 384 N 1–5. In the formula we find "Mommon Thoth Nanoumbre" i.e. Egyptian "Nanou p Re = Good is Re."

36. Mag. pap. Lond. 46, 240–9b; Lexa i 162 f. Lexa stresses Egyptian character, even the incorrect use of 3rd personal singular of the personal pronoun in place of the 2nd.

37. Harris mag. pap. 7, 1–4; Lexa ii 39 (2 oth dyn.). Action: "Say 4 times and set the Divine Eye, in which is made the image of Enhuret, in the man's hand."

38. Scott i 97; Chwolsohn i 638; in gen. Chwolsohn & Segal, with Bousset (5).

39. Scott i 108. Ahaydimon: Lemay; Chwolsohn ii 13; Massignon 368; Fück 14 n. 18; Stapledon (5) 70.

40. Kahane 119 f; for *Krater*, 18 f. Krater appears in art scenes of prophecy, e.g. with Lykophron and Kassandra on Berthouville silver cup: Webster, *Hellenistic* Art 1966 36. Krater of Alexander seems first brought in by Ploutarch, prob. going back to great krater of Dareios used on state occasions (captured by Alex. at Sousa); the mixing-bowl scene should prob. be set at Sousa (when policy of mingling Macedonians and Persians was inaugurated), not at Opis where sharing was limited to Macedonians: E. Badian, *Historia* 1958 vii 425–44.

41. Hermes: CH i 48 (frag. iv, 4); Scott ii 140; Angus 343. Also Frags. xiii 3, 11b, 13a, 14. Thoth: F (1) i 68 & 86 f; R (8) 73–83; Bousset (4) 38 ff. But see Otto (1) i 15 n. 3; Boylan 112 ff & 122 f. Inscrs.; Brugsch (1) 49 & 57; R (8) 73 & (1) 59–68.

42. 35 *Chapters Zos. to Euseb.*, AG 169. 5; F (1) 1 244 (11); and AG 150, 12; F (1) i 243 (8). Sublimated: *aithalē*.

43. AG 408, 4. AG 282, 14. AG 89 9 f, Olymp. citing Zos. See also Isis to Hor. F (1) i 253 & 259. Cf. Olymp. 84, 12, "Chemes, who had been disciple of Parmenides,



declares: One is All, though which the All is; for if the All does not have the [One], Nothing is the All": F (1) i 252 f.

44. AG 100, 100, 18 to 101, 10; F (1) i 126 f.

45. *Math*, iii praef. 2–4; *Astr. Gr.* 185 ff.

46. Cf. *Math.* iv 22, 2; iii 1, 1 f. He says (iv *praef.* 5) that he has transcribed "all that Hermes and Anubis (Hanubis) have revealed to Asclepius, all that Petosiris and Nechepso have set out in detail, all that Abraham, Orpheus, and Kritodemus as well as other men learned in astronomy have produced." R (1) 125 f prefers *Chnubis*; Serruys, *rev. philol.* xxxii 1908 147 f *et Hermanubis*. In gen. F (1) i ch.v.

47. AG 125, 10; F (1) i 248 f (23) connection with Nile: AG 263, 3 ff; BC ii 330 and 333 n. 11; AG 120, 19, stone with *pneuma*. Living: Anon, AG 132, 16. Silver as moon, CMAG vii 1 and passim. *Theōrētikōtatos Hermes*: B (3) i 261.

48. AG 115, 10; Olymp. 93, 14.

49. AG 20, 13 (Egg: Mark f 106): F (1) i 253 [32].

50. AG 132, 19. Text not sure: F (1) i 74.

51. AG 424, 8; F (1) i 74. Text bad.

52. AG 156, 4; F (1) 243 f; Ruska (2) 11 f. Cf. AG 162, 3 on softening-whitening; 128, 15, lye-washing for 6 months, cf. Olymp. 69, 16 and 72, 1. Also 132, 16 and 422, 15. Term "flower" can refer to actual yellow flower used for colouring metal or to efflorescence (flower of copper or of salt. Saffron at times seem to represent a metal. Acacia-gum is Arabian. Olymp. 99, 12 says H. often advised, "boil it in a stuff of thick linen."

To Pan, the All, at times means various preparations: 192, 21, it is symbolic name of metallic body of magnesia, Lippmann (1) i 78. For magnesia F (1) i 145–7. Beginning and end: ano kai kato, above and below, may be part of the formula: Lippmann (1) i index ano-kato.

53. AG 281, 14. Also the form *Pauseras*.

54. F (1) i 251 f: items 2, 3, 5, 9, 13, 15, 29 f, 17, 22 f, 28. Olymp. says both H. and Agathodaimon call lye-washing the Great Treatment, AG 72, 20.

55. AG 175, 12.

56. F (1) i 255 f: cited by Synk.

57. I *Cor.* 11, 10; *Gen.* vi, 2.

58. F (1) i 209 f. *Koiranides* must go back at least to 1st c: inspired Marcellus of Side in poem on Fish under Hadrian.

59. *Ib.* 211 f. Harpokration's book was graved on a *stēlē* of tempered iron; Euphrates. Hermes in Syriac on a *stēlē* of iron.

60. *Kyran.* 20, 10–4; F (1) i 212; *koukouphas*, Egyptian word, cf. Horap. i 55; PGM ii 18 and vii 411 (diminutive); *kakouphas* iii 424. *Poupos* seems deformation of Latin *upupa* (French *huppe*). *Koiranides*=content of *Kyranides* II–IV.

61. AG 207, 1–4; Zos. 107 ff. esp. 111, 19; B. intro 127 on Paris MS 7147 f 80 etc.

62. Olymp. 101, 11; F (1) i 212–14, cf. *Koiran.* 54, 1 and 286

63. CCAG viii 2 (167, 3); Delatte, *Herbarius* index *pivoine*. Cf. *Kyr.* 6, 1. Sacred Book: *Kyr.* 7, 22.

64. *Kyr.* 21, 25.

65. AG 213 f; F (1) i 254 f. *Komaris*: Lippmann (1) i 22. Heron = Horos: Perdrizet (3) 8–11; Cumont (13) i 1 ff, esp. 6 f. R (1) 144 n. 3 suggests Heron = Agathodaimon, which is unlikely. A TC of a falcon-headed Horos has on back Heron: Perdrizet (4) no 110, p. 36 and (3) 9.

PG, v 247 ff (sun-prayer): "I am Thoyth, finder and founder of pharmaka and letters . . . I am Heron of high repute, egg of the ibis, egg of the falcon, egg of the ever-roaming Phoinix."

Another extract of *Book of Sophe* (AG 211) has as subtitle (f. 251 f): "Mystic Book of Zosimos the Theban." F (1) i 26 n. 1 thinks it might be by Zos. of Panop; it repeats the phrase about conquering poverty. But the author might well be citing Zos.

Sun and Eyes: Sext. Emp. *adv. astr.* v 31; Porphyr. *Isag.* xlv, cf. CCAG v 4, 217, 12 ff and vii 233, 8; Blum 97; Cumont *théol. solaire* 23 [469], on sun-king, 7 [453] n. 1.

66. AG 23, 8–17; 115, 10; 267, 16 to 268, 2. Demok.: MS 2327 f293.

67. B (1) 135 f and 356; Cardan etc. *Misc. Berol.* i 19; Fabric. xii (1724) 696; *Syb. Books* i 141. B (1) 134 says Hymn of Hermes from *Poim.* was recited by alchemists.

Bythos: Crutwell 211. Sophia, last of aiones, longed to know the Bythos; pined and wandered to melt into infinitude; met Horos (Limit) who assuaged her madness; she bore prematurely Enthymesis (Reflection) who was excluded from the Pleroma and sought refuge on earth, 212a. Charis: Iren. i 1; Bonner (1) 178 f: Koptic Gnostic treatise. Also PMG xii 229 and Hippol. vi 37 ff.

68. Ruska (2); Steele for full details. Also Ferguson i 39; Holmyard (7) 56 f; Rodwell 62; T. Thomson i 10; Waite (2) ii 243.

Galienus is gen. taken as form of Galen, but there was a later alchemist of this name, a bishop's scribe: Paris 6514. Another Galienus is said to have summarised, or commented on, a coll. of natural magic, *Liber Vaccae*, *Liber Institutionum*, or *Liber Anagnensis*: Steele 5. For rel. to Apollonios (Balinas): Ruska 178; Steele 5; Nau, *rev. de l'or. chrét.* 2nd s. ii 1907 105. Holmyard rashly thinks the Table "one of the oldest alch. fragments known": Ruska is more cautious.

69. Ruska 114; Steele 4.

70. Read 148.

71. Read 148–52, plates 32 and 35. The Table was known in 13th c.; referred to by Albertus Magnus. Holmyard found a corrupt Arabic version in work ascribed to Geber.

72. Stapleton (5) 76, xi, and 88; AG 18–21.

73. Stapleton (5) 75, ix, and 87.

74. Ib. 81, xxi, and 89. Subtle and Gross are rep. in Greek by *pneuma* and *pysche* opposed to *soma*, Stapleton 80, xvii. High and Low, 84, xxix; Up and Down of Vapours, 77, xiv; rel. to Aristotle, 90.

75. AG 53, 13 and 138.

76. Stapleton (5) 82, xxiii. *Dialogue*: AG 295.

77. All this from de Rachewiltz (2) 169–75, figs. 80 f. Translations of *nadi*: De Campigny, J. Marques-Riviere, Evans-Wentz (*Le Bardo Thödol*). Evans-W. 125 for *Brahma-danda*. *Aion* has meaning spinal marrow, *Hymn Hermes* 42, 119.

78. Stele (Berlin Mus.): Marucchi, *Il Grande pap. Egizio* 1888 p. 5 n. 1; Kopt: EGW i 297 f; Pyr. 386b, 401a, 2037a. Imakh: EGW i 81 f; Gardiner (3) 465 n. F 39; Dawson JEA xxii 107. Night-sun: EGW i 81 n. 12; P. Leyd. T 71 Sa: EGW iv 8 n. 14 and iii 414. Also Schiaparelli, *Libro dei Funerali* 387.

79. Lewy (2) 43 f; Porph. in Euseb. *pr. ev.* v 8, 11 f. Noises: Iambl. *de myst.* iii 6 etc. Cf. Montanos, "Behold the man is like a Lyre and I fly up to him like a plektron," Epiph. *pan. haer.* xlviii 4, 1, and Odes of Salomo: Lewy 46 n. 147; also 46 for theory of possession.

80. Derchain (2) no 448 and no 214. Goat-headed staff or sceptre, no 211; bearded god (? Sarapis) with star on head holds a snake-twined trident and cadeceus in his two hands, no 208; cuirassed male figure holds an undulating serpent each hand, with a trophy on his head, 20 287; man carrying three whips walks on a smaller prostrate figure, each has a star on head, while on the reverse a daimon with two heads (lion, cock) holds an undulating serpent in each hand, no 258; a skeletal ibis-headed figure holds a snake in each hand, no 197, etc.

81. Hyppol. *ref.* v 12; *John* x 7.

82. Hyg. *astr.* vii: cf. Oxy. 2688. In general J.F.M. de Waele, *Magic Staff of Rod in G. R. Antiquity* (esp. pl. opp. 213). The papyrus has 3 snakes in the caduceus. For *Sah*: C. J. Bleeker, *Eg. Fests.* 1967 136.

Macrob. *sat.* i 19 says the Egs. interpret the cad, as *genesis*.



## IX. ISIS

1. AG 28–33 and 33–5; MSS 2327 f256 and 2329; Hoefer i 290; Scott iv 145–9; R (1) 141 f; F (1) i 253 ff, cf. MS 2327, f 261.

I use 2329. For oath: PGM iv 1705; Cumont (14) 152 1–5 and 154; BC ii 313A, 4b and 315 n. 8; AG 57 f. In magic: Hopfner (1) ii par. 35; Vett. Val. 151 1 f and 172, 27.

To Son: CH xiii 3; Vett. Val. 361, 17; KK i 32; Cumont (14) 155 and 158 f; Hopfner (1) ii par. 35 and i par. 728; Dietrich (1) 52 f.

2. AG 89, 8; F (1) i 253.

3. PGM xiii 795; T. bar Konai: BC ii 126–9. Star: Luke xxi 25.

4. Bousset (3) 382 connects with doctrine attrib. to Setheans by Epiph. *haer.* xxxix 3, 5 (Holl 74, 15), which also links Seth (assimilated to Zoroaster, BC i 45) with Jesus.

5. Hermes: Zielinski 356–8; F (2) iii p. clxviii. Psais: R (1) 141–4.

6. *De is.* iii, 352ab, cf. R (1) 136 n. 4.

7. PGM xxiv a 1 and viii 22. Diod. i 27; inscrs. of Ios and Andros (F. Hiller de Gaestringen), I.G. xii fasc. v pt. 1 1903; Peak; Harder; F (3) and (4) etc.

8. CH i 62–5 (v, 6 and 11); par. 8 uses analogy of painting or statue.

9. Diod. i 25, 5f. Hereditary priesthoods: Egypt, Otto ii 200 f; Chaldeans, Diod. ii 29; mages, Rapp *Zeit. DMG* xx 70 ff; MMM i 10 n. 3 and 239 n. 4; Bardasanes in *Patr. Syr.* ii 602; Kosmas Hieros, in CCAG viii 3, p. 120.

10. CH iv 21 f (frag. xxiii 65–8). Philosophy and magic: Cumont (1) 164 n. 4; medicine, 122 and 151 ff; Plout. de san. tuend. 1; Galen *scr. min.* 2, 1 (Müller); Delatte, *anec. athen.* ii 1939 456.

11. Wilcken *chr.* 70 76.

12. Dölger (1) i 86–9; 66–72 and 317 (Mithras); Tert. *de praescr. haer.* 40. Dölger ii (1930) 110–6 (Attis); 297–300 (Dionysos); 291–6 (Atargatis). Early Mesopotamia: Contenau (1) 233.

13. JHS 1888 1; BM Cat. E301. Jane Harrison (1) 463.

14. *De ser num. vind.* xii; also Phanokles in Stob. *flor* p. 399 v 13. Ridgeway, *Early Age of Greece* i 398, argues pre-greeks tattooed, but the Achaians did not take it over. Babelon 128 argues for scars left from blows as ritual marks. Dölger 294–6. *Sēmeia* also means omen, portent.

15. PSI x 1162; Cumont (14) 155 f. Herald: IG v 1, 1390 (Ditt. 736, line 115); CIL vi 500 and 504 (Dessau 4148, 4153); RE *keryx* esp. 351; AJA xviii 1914 244; Sardeis VII i, inscrs. ed. Buckler-Robinson p. 12 no 8, 12 f. Also the *Krater*: here above ch. 8 n. 41.

Kabeiric: Wilcken AfP x 1932; Sarapiastai with Ka- as Kanopos and Jewish influence at beginning: Momigliano *aeg.* xii 131 ff. Augustus: Dion Kass. lv 31.

16. Budge (5) 247 for rep.

17. Proshymnos: Clem. *protr.* ii 30P; priest, *strom.* vi 4, 37, 1. For archangel of dekans see later.

18. *Met.* xi 11.

19. Amelung, *Sculpt. Vat. Mus.* ii pl. vii, 55; Perdrizet (5) 48–50 pl. xii; AA xxi 1906 139; Schede *angelos* i 1926 pl. iv; J. Colin *Mem. Ec. Fr. Rome* 1920 pl. 1; Mancini *n.sc.* 1925 137–9; Tran Tam Tinh 95. Cf. also Aula Isiaca on Palatine, Rizzo *le pitture dell' A.I.* 32 fig. 32 (cf. figs. 34 f.) Contents, not phallos: TTT, cf. Clem. *strom.* vi 4, 37, 1; Diod. i 97; Plout. *de is.* 36. J. Leipoldi *angelos* i 1925 127; Dölger v 1930 153–87, esp. 156 ff. Dekans: CH iii p. xlv ff, sons of dekans assimilated to daimons, p. liii–iv

20. B (1) 129 and 36; MS 2327 f 249v; AG 26, 11. B cites Diod. iii 12 f and Agathark. GGM i 126 for these places as metallurgical centres. The list comes after a treatise of John the Archpriest: Mark f 138 entitles it *Of Metallic Stones*. For John: 2327 f243–9; B (1) 187. In the treatise which shows interpolations, he invokes in

Gnostic terms the celestial and demiurgic natures, Unity and Triad, and cites Demok. and Zos. Date: prob. 5th c., B (2) ii 263 and 130, 4; T (2) 118.

21. Synk. 105, in Loeb Manethos 44–6, fr. 14; Euseb. (Synk. 106) *ib.* fr. 15; Armenian (Chron. i 97), ib. fr. 16. For Zos's book under patronage of Sophe (Souphis): B (1) 58 and 159.

22. R (1) 141 n. 3; F (1) i 256 n. 2. Egyptian months in alch. texts: MS 2327 f 280 and f 287v: B (1) 33 f. Egyptian language: mixtures of Egyptian (hieratic or demotic) in Leyden papyri, B (1) 84. Zos.: 2259 f81; Olymp. 2327 f219v; B (1) 134. Note 7 springs in Mag. P. Berl i 235. Orphics: see JL (5) 36.

23. Cumont (1); Gundel (1); Nock (1).

24. Euseb. HE vi 32, 2; Jerome *vir. ill.* lxiii: Synk. 359b. Sok. HE ii 35. He seems to have known Hebrew.

25. *Vit. Hilar.* xxi (PL xxiii 38). Temple of Imhotep at Memphis famed for magic: PGM vii 628; Hopfner ii par. 14 f, 181 f and 206; Synk. 248b (Dind. i 471; *vors.* 68 (55) B 300, 16); Cumont (1) 163 ff and 170 n. 2.

26. Cumont conjectured he was T. of Tralles.

Plin. xxix 5; Galen *meth. med.* i 1 f; 4 f; 8; 10 f; *adv. Jul.* 1 etc. Method of *metasynkrisis*: Caelius Aurelianua, *de morb. acut.* ii 38 (173); Soranus, *de arte obstet.* 128; 210, 212. The Latin version of the story calls T. a philosopher, which could mean physician, e.g. Galen: AG 292 ff Kleo., R (9) 15, for alchemists. *Methodikoi*: O. Temkin, *Dumbarton Papers* 1962 xvi. 98; Dioskorides studied at Byz. as great botanist, *ib.* 100.

27. Letter to a King: Hopfner (1) ii par. 36. Here Claudius or Nero. R (3) 127 n. 1; Nero, Delatte (6) 801, cf. CCAG viii 4, 254.

28. Thorndyke ii 324; Cumont (7) and (8); R (3) 127–31; Nock (5) 108 f and (1) 163–5; F (5). Latin version adds, "There are more herbs and stones on earth by whose mediation man may win immortality; but it's inconvenient that some men should know their operations; for, while owning a brief life, they do not hearken to, or observe, the god's laws and precepts; how much worse would they be if they had immortal life." The god then ascends.

For throne: cf. Komarios, R (3) 129; F (5) 62 n. 26. *Theia phōnē*: phrase consecrated to revelations: *ib.* 63 n. 31.

29. *Strom.* xxvi 46 (816) adds, "The priests are said to have been mostly astronomers and philosophers," goes on about their astronomy and calendar-lore. "They attribute to Hermes all wisdom of this particular kind."

30. Hopfner (1) ii par. 70–5; F (5). Theurgy: PGM iv 475 ff. Medium: Hopfner ii par. 273–92.

31. Hippol. iv 32 and 35; Hopfner (1) ii par. 152 f; Ganschinietz, *Hippol. Capitel gegen die magier, TU* xxxix 2, 1913, Hippol. goes on about an advent of Hekate.

32. Gans. 63; *Kyranides* i 3, 12; Hopfner (1) iii par. 12. Phosphorescense, B (2) ii 353, 5; 94–7. 110 ff. Against wall, not on ground: Hopfner ii par. 152. Cf. marionettes, Heron *autometop.* xxx 1. Other light-effects: Hopfner ii par. 153; Bidez (9) 79 f; Cyprian of Antioch *conf.* 3–6 (Baluze 1107); R (9) 51.

33. F (5) 69; PMG iv 286; in gen. Delatte (6) 71–82. There are phrases from the LXX. See also two magic texts for gathering: PGM iv 286 ff; F (5) 70; see Delatte (6). Addressing plant to be gathered, not snatched, personifying it: F (5) 70 n. 1; Delatte (6) 60 on kathartic value; F (12) 299 f. Myrrh personified and prayed to: PGM iv 149b; Hopfner (1) par. 485; P. Oslo i (PGM xxxvi 333 ff); raising-up of plants, Lewy (2) 231.

34. PGM iv 2978; F (5) 70 f. Isis of Dew: PGM xii 234. Ka: Hopfner—Priesendanz takes it as Mnevis, citing Plout. de is. 20. Abyss: *bythos*. Used in Gnostic sense, cf. PGM xii 229; Hippol. vi 37 ff. Not Agathodaimon: F (5).

35. Contenau (1) 155f; (2) 161; 318 n. 4. based on S. Langdon (3), Seleukid text.



## X. ANCIENT AND CONTEMPORARY CRAFTS

1. See Eliade (1) chs. 9 f; Tegnaeus, *Le Héros Civilisateur*; K. Meuli, *Hermes* lxx 1935 121–76; H. Ohlhaver, *Der german. Schmied u. sein Werkzeug* 95 ff; R. Eisler, *Das Quainzeichen* 111; R. Andrée, *Die Metalle bei Naturvölken* etc.

2. Eliade 99 f.

3. Forbes (1) i 124; kohl, ix 165 f; in gen. *Ambix* 1938 ii 3–16.

4. Forbes (1) i 128. Much more might be added on secrecy: F (1) i 127; Contenau (1) 188; Ghalioungui 47; Clem. *strom.* v 7; Plout. *de is.* 7 etc etc. Cf. crypograms in Egyptian texts; magical alphabets etc.; jargon in magic, Bonner (1) 11 and 196; Jerome *ep.* lxxv 3, 1 (CSEL 55); palindromes; jumbling-up of names.

5. Reports of excavs. in 1968.

6. Dubs (2) 23 f; Singer i 581–4.

7. Dubs. 24.

8. J. A. Knudtzon, *Die El-Amarna Tafeln*; S. A. B. Mercer, *Tell el-Amarna Tablets*: no 10, lines 19 f; also 7 lines 71 f.

9. Singer as in n. 6 above.

10. Forbes (1) i 125.

11. Lucas (1) 85 ff. Akkadian terms: Forbes *l.c.* table ix.

12. Holmyard (2) 13 f. Gulkisar: C. Thompson (4) and Contenau (1) 187 f. Continuity in several terms, *e.g. shadanu*: Arabic *shadana* (haematite); *sipru* seems to lead to sapphire and to mean "scratching stone". We meet *kibaltu*, but are not sure if it is cobalt.

13. Lucas 259 ff. Refs. to fine gold in records of 20–21 Dyns. Holmyard 6 f for terms. Medes and Egs. as goldsmiths at Sousa under Dareius, Olmstead 168.

14. Diod. iii 1; Petrie (2) 94. Goldplating, Lucas 265; electron 267.

15. Glass: Lucas 207 ff; cobalt 217 f. Till late in Egypt materials for glass were quartz sand, calcium carbonate, natron or plant-ash with colouring matter.

16. Lucas 178 ff: he thinks sequence may really have been glazed solid quartz before powder, finally glazed steatite.

17. Glazes: Lucas 178 ff; faience 185 ff; uncertain when lead glaze came in—Ptol. or Roman? 190–2; Origins of glazing 194–8.

18. Orph. *Lith.* 201 ff; Plin. xxxvii 124.

19. Forbes (1) i 128; Langdon (1) 339.

20. Light-dark: Langdon (1) 339. See also Langdon (2) 337; BM, CT 24, 49. 3b, K4349; tablets, VAT 9874, K 11151. Forbes (1) i 128. See Table of metals and planets in Partingdon (3) 62 f.

21. T (1) 19; B (1) 224.

22. R. Clarke 60 f; Budge (5) 12–6.

23. T (1) 33–7; brass, T (2) 127 f; alloys, T (1) 35.

24. Only evidence for private ownership, dubious reading in P. Iand. 144.

25. SEHRE 342; in gen. 688–91, nn. 100–2.

26. Philostr. *Apollon.* vi 2; Lucas; copper in Fayum SPP xxii 48; BGU 197; copper and kadmeia, Cyprus, Plin. xxxiii 131 (166); tin. P. Holm. and Leyd., cf. Leontius, *vita S. Ioann. Eleom.* iii 15. Clem. *paid.* ii 3, laments use of gold and silver vessels, but does not say where from.

27. BGU 1127; A. C. Johnson no. 228 addressed to Achaios presiding over the Tribunal at the Palace.

28. Lond. 906; Wilck. *chr.* 318; Johnson no. 236. For wording cf. P. Amh. 92; W. *chr.* 311, Herakleia A.D. 162–3; Johnson no. 210, tax on sale of oil for press.

29. V. Martin. *Logisterion*: private or official bureau? *Chrysochoos* in *Od.* iii 425 for gilder of sacrificial victim's horns.

See also P. Strassb. 92, 4 (3rd c. B.C.); Ostr. Bod. i 304 (2nd c. B.C.); Baillet *inscr. gr. et lat. des tomb. des rois* 1076.

30. Oxy. 1117.

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31. Archives Isidor. ed Boak and Youtie 1960 no. 62. For the law: Wenger, *Quellen d. röm. Rechts* 469 f; Schönbauer JJP ix–x 1956 95.

Blanchet, *Pr. verb. Soc. fr. Num.* 1899 pp. xvi ff and xlviii ff; *Et. de Num.* ii 1901 195 ff and 224 ff; Mau, *Rom. Mitt.* xvi 1901 109 ff; SEHRE i 96. (Taken as mint: RM xxii 1907 198 ff; *Num. Chron.* 1922 28 ff; Hermann, *Denk. Malerei* 37.) *Negotiator*: Della Corte, *Riv. Ind.-Gr.-Ital.* vi 1922 104. Cf. shop of Pinarius Cerialis, *caelator*. For blacksmith's shop: Brusin, *Aquileia* 1929 118; SEHRE 176. Smith, seated in chair, holds with tongs the iron he hammers on anvil; a boy or slave behind blows furnace-fire with bellows fixed to a protective shield. Products shown on right: tongs, hammer, spear-head, lock.

32. Fuad Univ. P. viii no 7. Text is bad; may mean, "I paid you 32 dr. for the long cloth of the embroiderer. I didn't write you by letter to get 80 dr. from Hierissa, for the remaining . . . on account, for the mirror."

33. Oxy. 1582.

34. Oxy, 1870.

35. Ptol., Tebt. 1086; 890; also 121 (94 or 61 B.C.), payments to various minor officials, etc. including goldsmith, line 18; includes barber and chalkeus. Goldsmith in Oxy. 2727; chalkeus, etc., in Panopolis Pap. (Dublin),

36. As goldsmith: Philostorg. HE iii 15; St. Greg. Naz. *c. eunom.* 292cd and 293d; Sok. iii 15. At Alex., Philost. *l.c.*; Theodoret HE ii 23. Irreverence: Epiph. *adv. haer.* par. 2 cf. 6 (p. 920), also 76; praef. *ap. S. Ep.* cf. 4; morals, *ib.* 76 par. 4. Writings only cited in Epiphanios.

37. JEA xlii 1956 122 f; xxx 1944 76 f. Cf. *fabrica aeraria, officina aeraria, officina aerariorum*; *Thes. Ling. Lat. sv.*; H. Bluemner 324, cf. Quint. *inst.* ii 21, 10.

38. Oxy. 989; 1912; 1913, cf. 1027. Oxy. 84; Od. iii 432 and ix 391.

39. Oxy. 135. Lead at Syene: Tait OP 310. For Smith at work; Oxy 113; JL (4) 46. Names for iron in Gr. and Latin: L. Deroy, AC xxxi 1962 98 ff

40. Lucas 156 ff; Plin. xxxviii; Theophr. *lap.* Blanckenhorn, *aegypten* 201 ff. Magical stone found at Thebes, GGM 654; see also Johnson 349 n. 29.

41. Budge (4) i 97 f.

42. Plin. xxxvii 75 f (197–200).

43. Clem. *protepr.* iv 43P; FHG iii 487 f fr. 4. Apis: Diod. i 85; Plout. *de is.* 43; Budge (6)i 60, 397 ff etc.

44. Wheeler; Filliozat. Virapatnam may have been on the China-route. Embassies: Needham (1) i 200. See tables, 192 f: coral and pearls from Red Sea, amber from Baltic or Sicily—via Syrian merchants?

45. Hirth (1) 243; Needham (1) i 199. Cobra-stone: Riddell.

46. Hirth (1) 48; for glass see Johnson 241. Note how work by men like Ting Huan and Ma Chün takes up mechanical toys of the sort developed by Ktesiphon etc. It is my opinion that Chinese contacts with Syria were earlier and fuller than is generally recognised and that many ideas or practices taken as Chinese derive from Syria. See Needham 200–3 on *byssus* and *storax*; water-clocks 203 f; Trepanation and theriaka 204–6 etc.

47. Needhan (1) i 197.

48. Johnson 241. Topazos: Plin. xxxv 39; *caer.* xxxiii 161 f; Vitruv. vii 11, 1; Theoph. lap. 55. Frit: Lucas 139 ff. Paraetonium (Plin. xxxv 36; Vitruv. vii 7) and sinopis (Plin. xxxv, 31, 35) from Egypt are prob. gypsum & red ochre. See further Johnson 350.

49. Dyeing: Lucas 172–7; Muschler ii 798, 919; Hdt. iv 189; Loret *kemi* iii 1930–5 23, 32; Plin. xxxiii 57; xxxv 25, 27; Vitruv. vii, 14, 2. Woad: Oxy 1279, 593, 729, 1052, 1685. Dyes: Pfister (1) 40 f and (3); safflower Pf. (3), Lucas 176. Secret methods; Plin. xxxv 150. Ancient nature of purple dying in Phoinikia: Akkadian form of Canaan is Kinakhkhu (purple), B. Maisler, *Bull. Am. Soc. Or. Res.* cii 1946 7–12; cf. Phoinikia, E. A. Speiser, *Language* xii 1936 121–6.

50. Temple: PP xxii 183 (A.D. 138); Johnson no 397. Government-control:



Mich. 123R vi 16 f; under Claudius, ib. 126, 6. Lessor: Lond. 286. Priestly monopoly: Wallace *taxation* 200.

51. Tebt. 287; Wilck, *chr.* 251; Johnson no. 396. For guilds: Harris 73. (At Thyatira: IGR iv 1265.)

52. Ryl. 98 with various refs.; Johnson no. 239.

53. Oxy. 2575; *Telônes baphikes* not elsewhere attested, but cf. Ryl. 98.

54. Oxy. 1648.

55. Oxy. 1041; Pringsheim *aeg.* xiii 3–4 1932 406–18.

56. Rees, Hermop. no 30. For legal form: J. Modrzejewski JJP 7–8 1953–4 218 n. 34; W. L. Westermann JJP ii 1948 9 ff, esp. 24. The conjecture *por* (*phyrai*) here might be wrong, e.g. *pro* (*batôn*), cf. Hib. i 32, 14, 16.

Other Byz contracts with purple-dyers: Grenf. ii 87 (SB 4503) A.D. 606; Erman & Krebs, *Aus d.Pap. d. k. Museen*; Johnson and West, *Byz. Egypt* 124 no 219, made by purple-dyer of This w ith purple-dealer in Panopolis; cf. PSI viii 902 (Mich. v 355).

57. Rees, no 52–3.

58. C. P. Jud. iii no 511: P. Ross. Georg. iii 38; F. Zucker BZ xxxii 1932 87 ff; Pistorius *indicio antinop.* 1939 18, 29, 31; Taubenschlag, *Law of GR Egypt* (2nd ed.) 365 n. 4; 366 n. 21. For lease, aeg. xiv 80 ff; Hermann, *St. z. Bodenpacht* 92 ff; Steinwenter *Das Recht d. Kopt. Urk.* 38.

See also Oxy. 736 (A.D. 1); 1293 (117–35); 1519 (257–8); Abinnaios nos. 71–5.

59. Doresse 223. Philip, Matthew and Thomas are cited as those to whom the task of gospel-writing were allotted by Jesus.

60. Oxy. 2567; manager for the O. nome got a duplicate. See notes in Oxy. xxxi as to *epitropos Hermou*. For items: Gazza. *Misydion*, diminutive: Galen xix 736; Diosk. v 100; *schistes*, Plin xxxv 186, commin recipes, Gazza 104; J. R. Harris 185 ff; P. Holm. index. Pfister (1) thinks alum maybe found in fissures of certain schists. Psobthis: Oxy. 485, see also Calderini *Rend. R. Ist. Lomb.* lviii 1925 529; Wilck. *chr.* 321 proves alum on camelback from Little O. to Fayum; but all the oases had alum and ochre. Uses of alum: Weidemann (2) 610.

61. BGU 697; W. *chr.* 321; Johnson no 349. Tax:? diapylion (Oxy. 1439). Advance P. Col. 1 R 4X (A.D. 155, camel transport); BGU 1564 (A.D. 138, clothing requisition).

62. Oxy. 2116; Johnson no 242—writing through secretary. Cf. Oxy. 977; Fay. 93; W. *chr.* 317; ib. 257.

63. Forbes (1) iii 5; 43 n. 12; 44 n. 15 and n. 13.

64. *Ib.* 44 (21). Egyptian god of scents. Chesmu: BIFAO lviii 31.

65. Perfumes: Lexa i 103 f. Hatshepsut: *Urk.* iv 219. 13 to 220, 6. Incense: hieratic pap. Berl. no 3055 1, 2 to 2, 4 (Amun). Funeral fumigation, *e.g.* Naville TB tab. ii Ag; iii Pe, Ia, Da, Le; iv Ba, Le. With offerings: index Pyr. texts. Capture: Tab. Piankhi, lines 97 & 102 f; *Urk.* iii 35, 4; 38, 5–5. Mazar for perfume (balm) factory of King Josiah by Dead Sea at Engedi on royal estate where the folk (? a guild) grew and made balm; workshop may have been in a fortified settlement on Tell el-Jurn.

66. L. & L. 6, 1 to 8, 11.

67. Repel: Berl. pap. 6, 3–5 (Lexa ii 105 f); Lexa ii 136. Vase: L. & L. 3, 5–35; Lexa ii 135 f.

68. Resins were used and some of ingredients must have acted as fixations; classical authors well aware of this principle, which must have been long known. Egyptian terms: Forbes (1) iii 12.

69. Forbes 17 & n. 37. Galena is lead sulphide; black galena is coupled with green malachite in the texts. This copper compound is found in early Tasian graves up to 19th dynasty; galena eye-paint from Badarian times up to Koptic. Stibnite and galena imperfectly differentiated: Forbes ix 165; medical uses, *ib.* Kohl: iii 18.

70. Forbes (1) iii 18; 20; 22 nn 57 f. Colouring perfumes, 31; Theophr. odours. Alexandreia: Plin. xx xii 59; Forbes 36, Johnson 4 and 473 (prices).

71. Sublease: Fay. 83 (A.D.) 161; Johnson no 238. See Oxy. 920, mustard; 1142,

pepper; 2144, frankincense; BGU 9, 3rd-c. tax of 60 *dr.* a month paid by *aromatopoles* and *myropoles* of Arsinoe.

72. Mendes: Athen. xv 688 f; Forbes iii 14; Plin. xxxiii 164 and xvi 40, Seplasia. White lead much used by Greek ladies on faces; found as round tablets in Athenian tombs of 3rd c. B.C.; Roman ladies used it, earth-of-Chios, or white excrement of crocodiles: Forbes iii 39 f; Xenophon *oikon.* x; Martial i 72, 5 etc. The use of lead produced many poisonings and deaths. *Rhypos* (filth): in magic text, P. Mag. Osl. i 332

73. Philon, *heir to div. things* xli.

74. *Kiddushin* 82b.

75. Forbes (1) iii 12, table iv.

76. AG 145 par. 3; T (1) 36.

77. J. P. Arnold, *Origin & Hist. of Beer* 1911; H. F. Lutz, *Viticult. & Brewing in Anc. Orient* 1922 78; P. Montet, *Les scènes de la vie privée* 253 f; Lucas 20 f. Cooks and ritual: Athen. xiv 659 ff. And J. M. Stillman, *Paracelsus* 37.

## XI: MARIA THE JEWESS

1. MS 2327 f122 & 204; T (2) 118.

2. MS 2314 (9th c.). We have also seen names like Petasios, Petosiris; Pammenes, cited by Olymp.; Pibechios (Pe-Beck, Hawk of Horos); Epibechios, 2327 f138.

3. Kleo. 2327 f74; Alex. in Mark f2; Julian 2327 f242.

4. B (2) ii 300–15; 2327 f268v. Treatise: B (1) 123, 171, also 55 and 123; Moses, 76.

5. Mark 185; B (1) 54, 83; AG 38 f, 13–29, 4. T (1) 34–6; T (2) 129.

6. Lexa ii 141; BM 10.070; Leyd. J. 383 is parts of the book; Griffith (2) early 3rd v. A.D., v 12, 1–13, 9.

7. Mark 102v, cf. 2249 f1010, and 2327 f255; B (1) 171. Exorcisms, Seals: Vassiliev, *anecdota* 332; P. Iand. 14, i 6 (Christian text); CCAG vi 84 ff; Schlumberger REG v 71–93; Mouterde etc.

8. Zos. 2327 f82; Bible 2249 f98, Mark 190v. Recipe, Leyd. 75a.

9. Doresse 107a; E. Petersen; "Mithr. Lit.," F (1) i 303 ff.

10. MS 2327 f20; 2249 f98 (Hoefer i 534); Mark f190; B (1) 64 f. Note also name Maria Kleophas, B (1) 172. Adam and 4 corners = cosmos.

11. T (1) 37 f and figs. 3 f; the accounts of operations and utensils here depend mainly on Taylor. B (1) 60.

Book of Sophe the Egyptian (attrib. Zos. AG 211, 12) cites Maria and may be Jewish. Note Sophar in Anon (AG 120, 19: given incorrectly to Zos. in Paris A f168v: AG 118: see BC ii 331 f; CMAG ii 6 f and 21 (f2v, no 4); Lagercrantz (4) 18 ff): seems Shapur (Sapor), cf. CMAG iv 39b. Bes pantheos: Derchain (2) 162.

12. B(1) 236 T(1) fig. 5

13. T (1) 42 f and fig. 7.

14. T (1) 47 ff.

15. T (1) 49 f.

16. See above ch. 7 n. 34.

17. Stapleton (5) 71, ii. For Arabic ideas of body, soul, spirit in 10th c., Stapleton (7).

18. See above ch. 6 n. 16; Zos., AG 266 par. 16. Stapleton suggests term Angel here is translation of *Pneuma.*

19. Stapleton (5) 72, iii. Many names: AG 182, 14 (Hermes).

20. *Ib.* 72, iv, cf. 73 v and vi.

21. AG 5; Stapleton (5) 86. Marble: AG 162, 14.

22. Blochet 106; BC ii 352 & 325–7; Manget, *Biblioth. chem.* 1702 i 515 f; R (9); 246gg; Ruska (4) i 43. R (9) 71 n. 1 thinks Book of Mary the Kopt is an Egyptian version of Aramaic original.



For Christian taking-over of alch. idiom: Cod. Barocc. 50 f375 (R. Bentley, cf. Malalas 686, Bonn). "Oracle of Ostanes on the Theokotos. Let us honour Mariam as having beautifully hidden the Mystery." Christ's Birth (and Death) are seen as alchemic. In general: von Premerstein.

## XII: KLEOPATRA

1. Chwolsohn (2) 129 n. Aetios: *Iatrika.* Her books cited as late as 7th c., Paulos of Aigina. Weights etc.: Hultsch i 253; 2327 f 15 f, Mark f108v; cited, Galen etc., B (1) 173.

2. B (2) 289; (1) 173; Hammer-Jensen: taken as early and of Egyptian origin.

3. R (1) 704 takes her as avatar of Isis; BC ii 326 n. 1; B (1) 290; R (9) 24, also 7; R (2) 129, Komar. Cf. vision of Krates after ascent to heaven: R (1) 361. Ostanes in dream: BC ii 347 and 311–5, invocation; Zosimos, AG 108 ff; R (1) 368 and (3) 312 f.

4. AG 289 ff; R (9) 21 & (10) 66 n. 2, also on Komarios; F (7) 74.

5. *Synthema*: whole made up of parts, Apollod. *poliork.* 180, 9; ointment made of several ingredients, P. Mag. Berol. i 256; medical mixture, *hippiatrika* 22; chemical compound, ps. Demok. 55b.

6. Mark f199v; 2249 f96; 2327 f23; AG 292. Sun-sign: B (1) 63.

7. Following Taylor's translation; see refs. end of ch. xxx xi; Browne (3).

8. JL (5) (5) 51; the whole ch. there; also Cumont (12) 4th ed. 24; Vieler AfR xxx 1933 243 ff; R (9) 20 for borrowing; AG 298, 12; *Luke* xi 27, cf. BC ii 333 n. 10.

9. Three rings: 2327 f196; f278, two circles of snake; stylised, 2325 f82 and 2327 f220. Metal symbols, 2327 f220; no circles, 2327 f80.

10. B (1) 84 f; PGM xii 238. MS 2327 f274v and f215. *Chrysorichtes* not in Lidell-Scott. Leyd. Pap. 75 continues with the numerical table as to illness; formula for separating married couple; cause insomnia causing death; friendship philtre made of plants, minerals, magic letters; explanations of mystic names of plants etc.

11. PGM i 143 ff; Bonner (1) 15. Magic work in the O.: Bonner 194. Metternich stele: Bonner 158; Budge *gods* ii 273 etc. The composite form of Bes is often called *pantheos.* Pantheos: Nock (5) 294.

12. Bonner (1) 254, D5; 256, D17 cf D18. Womb: 273 D29, D131, cf. D132–42, D145; Harpok., 287 D205; scarab 294 D251; three rings 302 D293; rider D296f (Chnoubis symbol, rev. 296); six rays, 299 D273; trident 278 D153; inscrs. D217, 271, 286 f, 290. Also Chabouillet nos. 2. 176 f, 2. 180, 2. 194, 2. 196, 2. 201 –b.

See PGM ii pl. i fig. 4, amulet of O. with heads of Aion and Kmephis = F (1) iv 191. Much more might be added from Derchain (2), but we have enough here for our purposes.

13. Bonner 265 D72, aniconic object on table may be form of Amun; and D354, bloodstone, on rev. Harpok. on lotus. In gen., Kopp *palaeogr. crit.* iii 33 (gems); Hopfner (1) ii par. 136 f.

14. Aion: F (1) iv 152 ff, esp. 182 ff, mag. pap.; Vermaseren 125–8; Helios Mithras *e.g.* PGM iv 516; Nilsson (2) 62 f.

15. PGM iv 1115. Stars, *stoicheia*; revolutions, *dinēsis.* Love as assim. to Aion, F (1) iv 186 n. 3, *e.g.* pap 1781 ff. *Pteryges*: winged as roof of celestial vault.

16. See n. 10 above.

17. PGM vii 505 ff. Mixture, *synkrasis*; ever-reborn, *palingenēs.* This invocation is a *syntaxis* with the daimon of the place; see H. Hanse RGVV xxvii 1939 14 n. 1; Preis. on PGM iv 216. The 5 Planets are in gen. the others than Sun and Moon. R (1) 190 n. 7 thinks Sun and Moon = Aion and Physis and the 5 planets = the 5 Iranian elements.

18. PGM i 309. Aion as god of fire and light, PGM iv 516 ff; Helios as Mithas, *ib.* 587, 640, 482, also 602. Serpent as red, see above Ibn Umail. Cf. AG I v 21 "and from (the serpent) comes the Red of Cinnabar, as they say, and this is the Cinnabar of the Philosophers," see Stapleton (5) 74 n.

19. Psellos *comm.* 113 bc and Prok. *rep.* ii 133, 17; Lewy (2) ch v etc.

20. Lewy 92 f and 98; also 86–8 and 95. Dreams: Rohde *psyche* ii 84, 3; Mart. Cap. ii 151. Limits: Psell. *hyp.* 14 (p. 74, 34). Psyche: Lewy 85 & 87; Psell. *exp.* 1153a. Plato, *thaiet.* 176a7.

21. Artemid. ii 13; Legley *Mél. Ec. Rome* lx 1948 136 ff; Deonna (1) 130 ff. Macrob. *sat.* i 19 and i 9; RA 1920 i 131. Also BCH 1913 262.

22. Claudian was much interested in phenomena like the Magnet; the imagery of the Phoenix etc. In some respects he is the forerunner of Nonnos.

23. Horap. i 1.

24. Snakes: Galen *theriaka* viii (K. xiv 235); Budge (5) 94. Asp: Ail. x 31; Plout. *de is.* 74; in gen. Diod. i 11 & Plout. 41 & 43. Diadem: Ail. NA vi 38 cf. x 31; on basilisk ii 5, cf. Nikandr. *ther.* 408; Heliodoros iii 8.

25. Hopfner *fontes* 657; Migne lxxvi 961; Artem. ii 13 (Hercher 106).

26. Boas 28; for serpent in art linked with time: Panovsky *studies in iconog.* "Father Time" esp. pl. xxii, xxxiv.

27. Horap. i 2. Note these are his first two items, app. the most important symbols he could think of. Weight, cf. Ailian vi 18. Plout, *de is.* lxxiv, "The asp, as being immortal and capable of motion without limbs, with equal facility and suppleness, they liken to a star." Both texts have *leiotatos* as adjective. Cf. Clem. *strom.* v 4. *Geras*: Ail. ix 16; *Physiolog.* 37 f; Philon bybl. in Euseb. *pr. ev.* i 10, 48. Year, cf. Servius *ad aen.* i 269. For year as ring, the cult of Anna Perenna.

28. Serv. *ad aen.* v 85. Prok *in tim.* iii (ii 247 D) attributes to Porphyr. the statement that Egyptians have symbol of circle round a cross for cosmic soul. Euseb. *pr. ev.* i 10, 51 says Egyptians rep. the cosmos as air-shaped and fire-faced with a *hierakomorphos* snake in middle, calling it the universe with Agathos Daimon in middle. *Meisi*: Sbordone 123.

29. Horap. i 59–61 and 63 f. Hephaist. i 1 (Engelbrecht 65). Astrologers, cf. Ptol. *tetr.* 175; Vett. Val. 170 f, 278, 314, 360; HT (Gundel 73); Firm. Mat. i 108 and 23. Caracalla: *IG ad res R. pert.* i 1063; Cumont CRAI 1919 315–23 and *Textes Mith.* 1899 i 289–92. Isis as kosmokrat. Oxy. 1380 line 20; only a few lamps show her sphere (2nd–3rd cs.); prob. goes back to mid-2nd c., of popular origin, confined to Roman Egypt.

30. *Pistis Soph.* (Mead) sect. 319, p. 320.

31. Leviathan, *Job.* Sheppard 88, cf. Greek Okeanos.

32. *Acts Apostle Th.* xxxii; Jonas 116; Origen *c. cels.* vi 25, 35; Liesegang 117; Hilgenfeld 277 ff.

33. Pistis: Schmidt ch. 136, p. 262, 24, who takes as Barbelo-Gnostic. Macrob. *sat.* i 20, 3 & i 9, 12; Philon Byb. (A.D. 42–117) FHG (Müller) iii 572, who cites Sanchouniathon of Beirut, legendary figure given as 9th c. B.C.

34. B (1) 62 f; *Philos.* iv 48, 7 (Wendland 71); cult of constellations, Manil. v 289–93.

35. Ophites, Jonas (2) i 360; R (12) 1st part. ch. iv. Amann, *Dict. Théol. Cath.* xi 1063–75; R Liechtenham, *Ophiten*, Herzog-Haupt xiv 404–13.

Naasenes held Naas the Serpent to be him from whom "are all that under heaven are named Temples," *Naoi*: Hippol. *ref.* v 4; cf. v 12, the Peratai consider "the Son the Serpent." A text of the *Book of the Dead*, 175, says that the end of the world Atum the demiurge will transform himself into a serpent (resume the form of the primordial abyss from which he came, Derchain (3). Osiris, now completely spirit, will thus be surrounded by the serpent; Derchain (2) 74 f, gem with mummy snake-twined (lion-head on snake?); mummy has three-pointed crown, Derchain no 91.

36. R. Clarke 240 f.

37. *Ib.* 50; Pyr. text 1146.

38. Sethe *Amun* 63 and 12. But Khnum is typical demiurge.

39. CT iv spell 321; Clarke 51 f—also *Univ. of Birmingham Hist. J.* v 26.

40. Zepi in Louvre; Clarke 81 fig. 11.



41. Osiris: JL (4) 79; (5) 82; Budge (5) 378. Sungod. JL (5) 55; Budge 97. Five-headed snake: Budge 104. Nut, Budge 536 f. Serqet on her snake-boat propelled by crocodile, 97. Snake Geb, 436. Snake between: Lanzoni *diz.* clix 8; two more exs. in book of Amduat (Jéquier, *Livre de ce qu'il y a dans l'Hadès*). Osiris and abyss: Derchain (3).

More refs for O. in Egypt: Osiris, Champollion, *mons., notes descr. ii* pl. 615. In gen. Hopfner (4) 136 (*Die Schlange*); Lanzoni *diz.* pl. clxxxix 3; cclxvi 23; lxxx (Bes on O.); *Med. Rijksmus. v Oudheden* Leyden xxiv 1943 25 ff figs. 15 f; Pettazzoni (2) pl. v 9–11; vi 11; RA 1920 i 130 10–2; RHR xviii 1888 55; Prinz 9 pl. 1.2; pl 1 3 f.

42. JL (4) ch. iii.

43. Budge (5) 547, Nut and stars. *Poikilia* and Dionysiac transformation, JL (4) 380–5.

44. MS 2327 f196v and 279; Mark f94.

45. Budge (5) 516 etc.

46. Stephanos: T (4) 39 and 46. Petrifaction: T. in *Ambix* i 45 f. Term for lapidary, *kabidarios*, seems not before 5th c.

47. T (4) 76 n. 74.

48. AG iii 21–3.

49. Browne (1) 204 f and 208. Note on powder: Browne 208 f.

50. Browne 17.

51. Read 241. The brief flag of "Independent Fiume" had the Ourobors with the 7 Stars of the Great Bear: Deonna (1) 134; see 133–5 for refs. for post-classical uses.

More Ouroboros refs.: Hittites, Deonna (1) 28; Phoinikia, Macr. *sat.* i 9; *J. Asiat.* 1895–6 151; ii 1878 239; RA 1920 131 n. 3. Mesopotamia: two interlaced serpents linking tails, Toscane, *mém. délég. perse* xxi 1911 296 fig. 394; Roscher *Lex. Sterne* 1475 fig. 42; von Buse 53; RA 1920 i 131 fl Deonna (4) 163.

Animated spheres: Deonna (1) 118–25. Beginning and end: Herakleitos; Cic. *nat. deor.* ii 18; DL vii 35; Cumont (6) 123 n (Pythags.); deity as sphere: Xenophanes, Diels *vors* (5) i 113, 21; ii 5, 40; 122, 11; 123; 12; Plato *tim* 33b; Seneca, *ep.* lxiii 29; Cumont (6) 123n; Deonna (1) 119 etc. Globe as universe: Schlacter; Brendel; F (1) ii 337; Deonna (1) 120–3. Also animated wheels, Kirke, Circus, Anna Perenna etc.

## XIII: WOMB FURNACE AND VASE

1. Boston 73; Eliade (1) 37; Forbes (1) i 127.

2. Eisler 116; Kunz 188; Eliade 37. Lapidaries: Ruska (1) 18, 165. Living stomes: Plumpe. Fusion of ores, sexual, Kumarbi myth: Walcot, *Hesiod and N.E.* 2.

3. Lippmann (1) i 393.

4. Plin. xxxiii 101; Diosk. v 99; Forbes (1) ix 161. Prob. male is grannular type; female, acicular. Bailey seems wrong in taking male as stibnite, female as antimony.

5. Plin. xxxvii 101.

6. Ib. xxxvi 25, 39; Theophr. *lap.* 4 f, also 37 and 28; Eicholz 36 f; 108 f. Sapphire, lapis lazuli; *kyanos*, dark azurite crystals.

7. Plin. xxxvii 180.

8. Cline 117; Eliade 36. Amd Granet (2) 496.

9. Firesticks, index Frazer GB; Nonn. ii 493 ff.

10. Dyaks: A. Berthelot 23. *Enoch* liii 9 f; Zohar f14b, 11, 152.

11. Eliade (1) 35 and app. D; S. Tolkowsky, *hesperides* 56, 129 f; Nonnos: JL (4) 321. Mages saw fire as bisexual, Firm. Mat. *de err.* 5 (Zieg.).

12. Eliade 36; *Caraka* v 3.

13. Eliade (1) 37 f.

14. Hippol. *ref.* v 14, 3. Horap. i 12.

15. *De is.* xliii, cf. Plato *symp* 190b; E. Sparziono, *Caracallus* 7.

16. Lauth for ring; Sethe *Amun* 63; Sbordone (1) 34 for play on Tan & Neit (spelt backwards). Ptah-Tanen; Budge *gods* i 511 and Sethe 58 f; Lanzone 255 ff. Amun and Amunet as father and mother, hermaphroditic: Sethe 33 f. In general Delcourt. For Orphic Egg and 4 Elements: R. Turcam (Mart. Cap. ii 140), RHR 1961 clx 11–23.

17. QN iii 14.

18. Aisch. fr. 70 and 44, N (2nd ed.). Arist. *met.* A6, 988a7; phys. 192a23; Simplik. 256, 14a, matter is opposed to efficient or final cause "as the female to the male or the ugly to the beautiful." See also Athen. xiii 555d on king instituting marriage in Attika, "regarded as having a twofold nature."

19. Iambl. *theolog. arith.* (3.21, 417 Falco). According to H. Oppermann (*Gnomon.* v 1929 545 ff eso. 557 f) the TA is a series of extracts prob. of 7th Book of *Synagōgē* of Pythag. doctrine by Iambl., cf. Arist. met. A5, 986a15 ff.

20. Nich. Gerasa, in Phot. *bibl.* 143 Becker. Oriph: fr. 21a K. Val Sor., Aug *civ. dei* vii 9 (287, 5–7 Domb.). Diogenes: Philod. *de piet.* 82 f; Gomp. *dox*' 548b, 14 ff; SVF iii 217, 9 ff. Chrysipp. ib. 80 dox. 547 b 16; SVF ii 316, 11, cf. SVF ii 315, 11; also Serv. *aen.* iv 638. And F (1) iv 45 n. 1, and Kleinknecht.

21. Oracle cited by Porph, *de phil. ex or. havr.* 1856 146 ff; Norden 228 ff, based on Plato and Pythags. Xenokrates and opposition of monad and dyad, *dox.* 304b 1 ff and F (1) iv 48 f; Norden 229–31 for eastern basis; F. replies 47.

22. Lewy (2) 121; Hekate as cosmic soul: 6 f. Hymen: DL ix 32. Aristotle uses it for both foetus and bowels.

23. *Tetr.* i 6 f; goes on as to assignment of the two destructive stars; Loeb ed. 40–2 for view of Cardan; Bouché-L. 102; cf. also *tetr.* i 12. Planets grow female by occidental position, where they oppose the sun; and v.v. when oppose moon. Bouché-L. 353 n. 3. See *tetr.* iii 14 for effects in making women *tribades*, etc.

24. CH i 11 f (i 15); see 21 for *harmonia*. Male-female, 22 n. 43 and n. 44 as to sleep.

25. C. W. Mitchell, St Ephraim's *Prose Refutation of Mani* etc. 1921 ii 210: CH iv 152, cf. Macr. *somn.* i 12, 8; *Pistis Sophia* 131 (Sch. 217, 1st ed.; 246, 2nd.); Scott iv 164 n. 2.

26. Text no. 26; Doresse 245–7. The Latin text is milder. Symbolism of mystical union among Pythags. Carcopino 120 f. Among Valentinians we meet the heavenly marriage of Sophia and Saviour, compared with the Husband and Wife in a Chernoboskion text (Doresse 224), and the union of the Perfect with the Angels surrounding the Saviour when the elect have entered the Pleroma: Sagnard 193 and 413–15, cf. *Extraits de Théodote* 64 f. Also Marcos (Iren. i 13); Manichees and Mandaians, Widengren (2) ch. viii; Fendt.

27. PGM vii 326, cf. Psalm x 4 and II Kings 22, 7. And PGM xiii 327; O. Weinreich (2) 345 f; F (1) iv 196. Aia as magical name, cf. Aiaia etc., Kirke and Medeia: JL (5) 7, 10–3, 63, 245, 367.

28. *De is.* lvi. Setheans: Doresse (1) 52; *Philosophoumena* v 19–22; Jonas (2) i 342. Bruce codex with its series of wombs. Cf. Chaldean oracles.

29. B (1) 64; Zos. in Mark f190v; B (1) 63; Mark f168v.

30. Stapleton (5) 76 f (xii, cf. xiii). Two vapours and three sisters; three marriages: xiv. Marriages with 4 wives: xv. Cf. *Qur'an Sura* xxiii 12.

31. *Ib.* 76, x.

32. Cf. above about stones growing. Plin. on galena, xxxiv 49; cf. Strab. v 2; Eliade (1) ch. iv for these and other exs., e.g. Cherokee shaman feeds crystal twice a year with blood or it flies off and attacks humans, 45. Neith; Harris mag, pap. 501 = BM 10.042 (9, 5 to 12)+ Lexa ii 38.

33. *Enuma elish* iv 136 line 3; Eliade ch. vii for discussion.

34. Eliade 67 f.

35. Cline 121 and 118; Eliade 60.

36. Elaide 61 f. Bronze and magic, G. Germain, *Genèse de l'Od.* 1954 153 ff.

37. R. P. Wykaert, *anthropos* ix 1914 372; Eliade 38; Nashona, Cline 41.



38. L. Wiener, *Africa and Discovery of America* 1922 iii 11 f. Swords, Eliade 28; Schwartzlose 142; Lippmann (1) 403. China: Kaltenmark 39; Granet (2) 496.

39. Eliade (1) 38; Eisler (1) 115. Mo-ye: Granet (2) 500 f. Other cases, L. Lancrotti, *East & West* vi 1955 106–14 and 316–22; in gen. Kaltenmark (2) 45 ff and 170 ff.

40. Ritual measures in smelting in Africa, esp. continence, Eliade 57 f. Sarat Chandra Roy, *The Bihors* 1925 402 ff; F. Dalton *descr. ethnol. of Bengal* 1872 186 ff. Cr. Oraons, P. Dehon, *Mem. Asiat. Soc. Bengal* 1906 121–81 (esp. 128–31); Rahmann *anthropos* xxxi 1936 37–96.

41. See ch. xi n. 12.

42. Tran Tam Tinh pl. iv 3; p. 94. Macr. sat. i 20, 18. Suckling, TTT 88 n. 1. B. de Rachewiltz (1) and M. Lichtheim JNES vi 1947 169–79. Phanos: Athen. xv 699; Schol. Aristoph. *lysis.* 308.

43. Steph.: T (4) and 46, n. 80; Olymp. AG 75; Zos in *Apparatus and Furnaces* AG 224, cf Stapleton (4) 40 n. 76. There developed, at least by Arab times a comparison of upper half of alembic and a cupping-glass, with blood conceived as vehicle of a man's spirit; in the top half the vapourised spirit of the mixture collected.

Also Steph., T (4) 43. Irritations: *proerethismos*, used by Galen (K. xv 622) for a condition, before disease, that could weaken the body. Place of the male, *androkathistria*, unknown elsewhere. *Diplosis*: AG 39, 9. Note that in Chaldean Oracles the Sources are the Mixing-Bowls in which Eros mixes fire; the Ideas spring from the Primeval Source, the Paternal Intellect—they are connectives, powers giving form to matter, and guardians: Lewy (2) 128, 345 f, and 349.

44. Narsai: P. Brouwers 186 f. Ref. is to Genesis i 20. Narsai founded the school of Nisibis. See also ch. 3 nn. 47–52.

45. Edsman (1) 78 and (3) 107 n. 2.

46. Smalz 56; Edsman (1) 78.

47. SBE xv 175 f, M. Muller. *B. Upanishad* iv 4, 4.

48. PG xxxiii 1040a.

49. Cf. *Dan.* vii 10; II *Petr.* iii 7.

50. Wensinck 25; Wildengren 437 (Syriac).

51. *De resurr.* i 43, 3 f and ii 20, 8; Edsman (1) 96 f, cf. Aineias of Gaza in our ch. iii. Potter: Edsman (2) 87 ff. *Enchir.* xxiii par. 89.

52. Hazlitt iii 201–20; Edsman (1) 104 f. Horse: Edsman 84 ff. In gen. Bolte-Polivka, *Ammerkungen . . . Grimm*, ii 149 ff.

53. Edelstein i 220 f; Ail. NA ix 33; fr. Hippys of Rhegion; Halliday (1) 287.

54. Erman (6) 306.

55. Harris mag. pap. 501 = BM 10.042, 4, 9 on = Lexa ii 36–8. The spell starts "Amun who hide yourself in the pupil of your eye." Action: "Say on an image of Amun with 4 faces and a single back, made of clay, the feet of which is the crocodile; the 8 gods of Khnum on his right and his left sing his praises." At Abu Simnel Ptah blesses Ramses II, "I have wrought your limbs of electron, your bones of copper, your organs of iron," Forbes (1) ix 62, Embalming: Budge (7) 187 f; G. Maspero.

56. Clem. frag. xxi 3. Thomas: Doresse 234.

57. Tertul. *cultu fem.* pt. i; Jerome *virgins profession* (Wright, *Fathers of the Church* 1928, 253); Greg. i 797D, Guignet 253. Cf. *Dialogue of the Saviour* (Gnostic), Judas asks, "Why does one live and die." "And the Lord said, 'He who is born of the Truth does not die, he who is born of woman dies.' " Adds, "Pray in the place where there is no woman . . . Destroy the works of femaleness," Doresse 220 f.

58. Clem. *strom.* iii 13, 92; Doresse (4) ii 158; James 11. And Doresse ii 157. Eliade (6) 103–8.

59. *Logion* 106 (Puech), 103 (Grant); Doresse ii 109 no 110, cf. log. 4, 11, 23 P; 3, 10, 24 G. Also John xvii 11, 20–3; Romans xii 4 f; I Cor. xii 27.

60. Grant 144. Jewish trad. in *midrashim*: "Adam and Eve were made back to back, joined at the shoulders; then God divided them with an axe-stroke, cutting

them in half," *Bereshit rabba*. Again, "The first man was a man on the left side, a woman on the right; but God split him in two halves," Eliade (3) 361. Scot Erigena cites Maximos Confessor on Christ unifying the sexes in his nature, for in his Resurrection he was "neither man nor woman, though he was born and died a man:" *De div. nat.* ii 4, ii 8, 12, 14; J. Evola, *La metafisico del Sesso*, 1958, 180.

61. Hippol. *ref.* vi 18; and v 6. Eugnostos: Doresse (4) i 211 ff; Eliade (6) 105. See further Eliade (6) and Delcourt (1) and (2) for many more details.

## XIV. AGATHODAIMON

1. AG 268, 3 to 271, 25; MS 2327 f262; Kern *orph.* fr. 333 (p. 33).

2. AG 115, 7. Attributed: Instruction on the *probaphion* (substance viewed in first stage of alloying): Zos., B (1) 193, cf. 212.

3. MS 2327 f202.

4. B (1) 137; Ganschinietz (1) iii 54.

5. Treat. xii 7 f; F (2) i 176 f. Being here is somata, bodies, persons. The noeta lack quality of individuation. "One is All": Norden (1) 246–50; Scott-Ferguson iv 152.

6. PGM iv 2987; de is. xx.

7. Wheelwright no 118 (D. fr. 50); cf. W. no 120, "the intelligence by which are steered all things through all things"—the end there has an alchemical ring.

8. R (1) 127.

9. Kyril. *c. Jul.* ii 588ab; R (1) 127 thinks a coll. of aphorisms; W. Kroll denies, RE viii 800, 51.

10. F (2) iv 135 and i 124 f with 135 n. 78.

11. Ib. iv 137 f. *Taxis* and *anaxēransis* go oddly together. For cosmogony cf. *Tim.* 30c; R (2) 78; J. Kroll (2) 142, cf. also R (2) 84 n. 3; Scott iv 213 n. 14 and 216 n. 9; Ferguson iv 488.

12. F (2) iv 139.

13. See here ch. iv n. 8; KK 32.

14. Roeder RE x 1832–6; F (2) iii p. clxii.

15. *De principiis* 125 *quater*, i 324, 4 and 6 (Ruelle).

16. Suet. aug. 94; schol. iliad vii p. 147; Athen. iii 83 cites his Egyptian history; *Souda sv Heraïskos*.

17. 324, 8 Ruelle.

18. Scott; R (1) 137.

19. Budge (5) 173; for Khnum, JL (5) ch. 4.

20. R (1) 137–44; Zielinski 356–8 against Roeder RE xi 913, 17–27. For Agathodaimon of Greek period, Ganschinietz.

21. Euseb. pr. ev. i 10 (41c and 42a): Hopfner *fontes* 291. BC ii 157 (O11) and 271 (7). Khnum with hawk-head: Roscher *lex. Knuphis* 1258; veneration of hawk in Egypt: Hopfner 803 sv accipiter. John Lydos iv 161 (177 Wu.).

22. Derchain (1) 179 no 5. Series: Bonner (1) 56 f; Kopp *pal. crit.* iv 1829 158 sought meaning in Hebrew "bound with incantations": HTR xxv 365. N.B. formula seems only on Khnoubis amulets: Bonner 199 and 57.

23. Hypostasis: *Edfu* vi 185, 3; Khnum-Nph vi 327, 11.

24. Kees (2) 437.

25. Derchain (1) 181 no 6. Snakegods and earth: Derchain (2) no 233, Manethos: Loeb ed. 15 (fr. 3, Synk., 32).

26. Derchain (2) 188 no 16. Birth: Bonnet, *Reallex.* 520. Womb in gen.: Derchain (2); Stricker i 45 ff. Lion-headed snake: Bonner (1) 54 ff and Delatte, *Mus. Belge* xviii 1914 69 ff.

27. B (1) 332; Berl. pap. i 27, 236. *Lex.*: MS 2327 f20; B (1) 32.

28. Bonner (1) 53; Galen simples x 19 (K. xii 207); Aetios, *tetr.* i 2, 36. Lion-headed type: Drexler in Roscher. Marcellus Empir. 20, 98, lapidary of Sok. and Dionysios (Ruelle ii 177, 11 cf. 12) etc.: generally recommend use of jasper or onyx.



29. Ruelle (1); Bonner (1) 54 f.

30. 52, 26; 53, 22–4 (Engelbrecht). And 54, 11.

31. Mély-Ruelle ii 177. Hephaistion puts under Crab.

32. Bonner (1) 55–9; stone and colour, 59 f. Vowels: Budge (1) 204. Proklos: King 223. Womb: Matter, pl. iiC, 4.

33. BM stone 56260; see HTR xxv 365–7 and JEA 1933 192. Ethiopia: Gardiner JEA xiv 1928 10 and E. Cerulli *Etiopi in Palestina* 1943 i 125. Holy water: JL (5) ch. xvii, also 286 f and 100. Thoth: Erman (6) 306 = Pap. Sallier i 8, 2 ff.

34. Badaw i 13. Khnum-Chnoub: Sauneron *Esna* 1963 90 n. 6. PGM iv 1635 ff; Derchain (2) 57.

35. Drexler denies the relation.

36. Bonner (1) 25; Budge (1) 204 and (2) 14, compares to snake and staff of Asklepios, which he says was taken from Sumerians, and compares *Num.* xxi 9. For argument "via astrology into magic": Delatte (2) 56. Sign: ibid, connected with dekan *knm*. Drexler links with the design in astronomic texts at Edfu and Dendera; name of dekan *Knm* 1264—also Brugsch *thes.* 18.

37. Sethe (2) 4. Iambl. *de myst.* viii 2 f; Porph. (Euseb. *pr. ev.* ii 45 f). Delatte (2) 56. The terrifying aspect of the first dekan of the Lion no doubt came from Kneph.

38. PGM iv 1598; R (1) 28 f.

39. PGM iv 939. Psois: Tarn (1); Weber 42 ff; Roussel (2) 91; Ganschinietz. Tyche: Oxy. xi 1380; Roussell no 119. Thermoutheis: Ailian NH x 31. Ptol. I: Arrian *anab.* iii 3, 5; Tarn CAH vi 378 n.

40. Bonner (1) 205. Crum *coptic dict.* 462a; 544ab.

41. Bonner 205.

42. Bonner 162; Perdrizet (1) for inscr. Thermouthis later identified with Isis. See two more stones, Bonner 163 f and 204 f. Delatte-Derchain no 223, Sarapis-Agathodaimon; 285 as ? Aion Ploutodotēs, cf. 437 etc. Glykon: ib. pp 67–72 and nos. 81–4 with ref. to cult founded by Alexandros of Abonouteichos, 2nd c. Another assimilation of the dekan: Junker, *Onurisleg.* 42 ff: three inscriptions. Derchain (2) no 190 for ibis connected with lion-headed snake.

43. Eye: Delatte (2) 72 f (no 89 bis). Giants: Bonner (1) 168 f.

44. Stapleton (4); for Table, 24. He goes into the question of magic squares etc., which I omit. Harran's site: Seton Lloyd, Early Anatolia 9.

45. Stapleton. app. B.

46. Refs. in notes, Stapleton 40–3. For marble: here. ch. xi n. 17. Steph.: T (4) 43 and 45; Holymard (8) 426. Gums: here. ch. ix n. 52: heat, ch. ix n. 76. *Chrysokolla*: ch. ix n. 62 and F (1) 142; AG 272, 4. Sun and dew: AG 45, 22v; 155, b, 10; Zos., 113, 18.

47. Granet (2) 234; Stapleton (4) 19 n. 33 (for azure instead of green). *Little Key*, lost, is mentioned by Christian: AG 281, 18 f, evidently dealt with purple stones (in one place identified with iochalkos, so may be cuprous oxide).

48. Stapleton (4) 43 n. Komarios: here, ch. ix nn. 53 and 64: see Stephanos in T (4) 39 and 46 n. 82.

49. Jamasp: Stapleton (4) 26; 28 f—on Demok. 29. See list 30 f.

50. Stapleton (4) 26–9.

51. T (5) 41; 43 n 99. No 41 not sure; Ideler etc: T (5) nn, 101 and 122. Copper: see also Browne (1) 210.

52. Lippmann (3) 21 with (1) i 224 and ii 107, citing Brandenstein RE Suppl. vi 181.

## XV. ZOSIMOS

1. Phot. *cod.* xx clxx; MS 2327 f203v; B (1) 177–87; Syriac, B (3) iii 210–68 and 197–308. His 28 Books: R (1) 266 f; the Christian, Riess RE i 1348, 30; F (7) 75. List of works: T (2) 119 f, also Gundel (3) 246 f and 252 f. Date: Riess RE i 1348.

2. Africanus: see here ch. x n. 24. Phot. *cod.* xxxiv; Euseb. HE vi 23 and i 7 (extracts) *Gep.* Needham 1781 p. xlii; Fabric. iv 240, etc.

3. AG 234 f; Ruska (2) 30 f (he points out it is not in *Furnaces*); MS 2249 f94v–102, also Mark f186 for variants; AG 236–8; F (1) i 273 f. B (3) i 22.

4. B (1) 181; 2327 f8, cf. f106 and 149; f230, "what men write, the gods are jealous of." Stone: 2249 f10 and 2327 f8, with Mark f85v.

5. Here ch. iii n. 21. The *Souda* calls him Alexandrian. He may well have spent some time in the capital.

6. Cf. CCAG iv 146 (each sign related to 2 letters): Boll (1) 469 ff. Dornseiff 25; *Etym. Mag.* 294, 29.

7. R (1) 267; AG 228, 7–11. R (1) 102–6; AG 229, 10 to 233); BC ii 243; AG 229, 11–20 etc. BC ii 245 n. 1; Scott iv 105–110.

Nikotheos: Porph. *v. plot.* 16; Scott iv 116 f; R (1) 267 f; C. Schmidt TU (NF) v 4, 58 ff; Baynes 84 f n. 7; Homer, *Il.* xiv 201–46. Divine water: cf. CMAG viii p. 2 no 55; AG iii 8 n. 2; Lippmann (1) i 8 and index *theion hydor*. But Omega is also one of signs of lead and of Kronos to whom lead belongs; AG 8, 13. Timely tinctures: F (1) i 264 n. 10; Ruska (2) 22 f. Procession, cf. CH (*Krater*) iv 7.

8. BC ii 243 ff; F (14). *Katarchai*: Bouché-L. chapters xiii-xiv, esp. 475–9; Sarapion in Cod. Flor. 99 etc.

9. Puech 145 and 151; Bruce *cod.* pt. 2; Doresse 86, 155 f, 313, 115; Plot. *enn.* ii 9; Porph. *v. plot.* Rapt: Ep. to Corinthians xii 2–4. Nikotheos and fall of primitive man: Bousset (3) 186 ff and R (2) 45 ff with rel. to enn. ii 9; BC ii 245 n. 5.

10. Stress against astrologic determination: BC ii 244 n. 3; Kroll (3) and (5); Arnob. *adv. nat.* ii; RE *sv Heimarmene*, 2640; R (3) 301; Cumont (12) 4th ed. 107 and 291 ff. Orientalising Hermetics with ascetic ways: Braüninger 33; rel. to Stoics, RE *sv Alchim.* 1347, 24. BC ii 284 f: *Heptaphthongos*, and prayers, loud, murmured, mute. Oriental gods v. Fate, eg. Isis, Peek 123 line 55.

11. Iambl. *de myst.* viii 7 f. For Bithos of Dyrrachium, Bitys, and Pitys the Thessalian: Kroll (6) 156 n. 2. F (7) 77; BC ii 308 = PGM i 135 no iv, 200: *Pityos agōgē* (? Bitys): R (1) 108 n. 2 and 107 n. 1; Hopfner (1) ii par. 367 ff.

12. Hippol. *ref.* v 7. Iranian primal man: Bousset (3) 215 ff; R (7); Cumont HRH 1936 39 n. 2.

13. Olymp. AG 89, 3; Jos. *ant.* i 1, 2; Euseb. *pr. ev.* xi. 6, 10; Scott iv 121.

14. Thus: "To Adam is joined Jesus Christ [who] transported [him] there when he lived before those who are called *phōtes*. And he appears still to men totally impotent like a man born vulnerable and stricken with rods, and in secret he takes away the *phōtes* that were his, considering that he does not suffer in any way but shows how one treads death underfoot and makes nothing of it." Adam: "whom they have struck down and put to death." "They kill their own Adam." (*Phōtes*: poetical for "men, mortals.")

15. *Antitheos*: Cumont (12) 278 n. 49. Chiliasm: Wikenhauser. BC i 219 f; Boll-Bezold etc. *Sternglaube* (4th ed.) 200–5; Cumont (10) 93 ff. Monogenes comes: Scott iv 132; Ruska. Prometheus as intellect: Plout. *de fort.* 98c; Synk. *chron.* 282 (Dind). citing Platon, comedian, *Sophistes*, i 136 Koch. Allegory: J. Galenos, *Allegor. Hesiod*; Gaisford, *Poetae Gr. Min.* ii 1823 580. F. suggests among Hermetic works, CH iv and i. For Fate: I Cor. i 12 and iii 4. Ears, cf. *Math.* xi 15; xiii 9, also 16 and.

19. *Antimimos*: Doresse 297, those of two souls in Dead Sea sect. The passage on poverty also in *Book of Sophe*; and Synesios attributes it to Demok., AG 59, 6, cf. 211, 9.

16. F (1) i 273 f; Ruska (2) 30–2.



17. AG 239 ff; F (1) i 275 ff with R (1) 214 n.1; Scott iv 111 f and 136–44; Ruska (2) 18–23. F 275 n. 2 on title; also 262 n. 1.

18. Title: OGI 100, 2; Cumont (1) 34 n. 3. Prophets: Cumont (1) 119 n. 5.

19. KK CH xxiii 67 f.

20. F (1) i 278 n. 4 on epitaph of Akmonia (*Mon. Asiae Min. Ant.* vi 335 no 315) on opening a katheton (prob. Jewish term), suggesting "a lair beneath the surface or the floor of a *heroon*."

21. *De myst.* viii 3. Terrestrial demons: Prokl. *in kratyl.* 69, 4; CCAG viii 4, 252, 11; Wolff, *Porphyri de phil. ex orac. haur.* 1856 112 n. 5. Porph. *de abst.* ii 36, 42; Aug. *civ. dei* xi 19; Cumont (12) 296; Tert. *apol.* xxii 6; Hopfner (1) i par 224 (index *Nahrung*); Min. Felix *oct.* xxvi; Cyprian *quod idola* vi.

22. *Apokatastasis*: restoration, re-establishment. I take it to mean a completion of the cycle, a return, a new start.

23. Blemmyes: Strab. xvii 1, 2 (786); *Chron. pasch.* (504 f Bonn) for 253; *Firmus* SHA iii 3 and *Aurel.* xxxiii 4, *Probus* xvii 2 f; Zos. (hist.) i 71, 4. Ostraka: Préaux *actes vii congrès int. de pap.* 1952 = *Mus. Helvet.* x 1953 218 n. 79. Blemmyes: J. Maspero 286–8; prem. on the wars (considered late 4th c. or early 5th): Schubart–Wilam., *Berl. Kl. texte* v 1. 1907 108; Draeseke, *Ph. Woch.* xxxiii 1915 15; Schmid-Stäh. ii 2, 959: a Homeric imitation; cf. poem, Vitelli *At. e Roma* vi 1903 149; Comparetti, *Pap. Fiorent.* no 114; Loeb *Sel. pap.* iii nos 142–3. Why not date them c. 300, or at least the first poem? Also, Préaux, *Mus. helvet.* x 1953 218; Oxy. 1194. Discoveries of Emery at Qustul Balliana have shown the B.'s wealth from the 3rd c., including many Alexandrian artworks—result of raids?

24. AG 190 f. Principles; *Stoicheia.*

25. F (1) i 280 n. 4. Iambres: ch. ix here n. 31. Also R (1) 214 n. 1. Solomon's treatises on magic: CCAG vii 2, 143–65; Harl. 5596 (Anec. gr. 397 ff); *Testament of S.*[3] MacCown; Paris 2419 (Anec. gr. 470 ff); also Anec. gr. 649 ff; B (3) ii 264–6. About 1000 B.C. the so-called Solomon's Seal was in Palestine the symbol of a planetary god (Kronos): Stapleton (4) 25 n; Lewy in *Hrozny* Fest. iv 1950 (Prague). See ch. xvi n. 9 here.

26. CH i and iv; here, ch. ix n. 31. Your Perfection, *teleiotēs*: R (*Hist. mon.*) 109 n.5.

27. "Corrupting": sepasthai, rot, moulder, decompose (wood), mortify (flesh), promote formation of a laudable pus (medical); also used of food rejected after digestion (Arist. *met.* 381b 12).

28. Note how Zosimos' "question" has a Taoist note.

## XVI. MORE ON ZOSIMOS

1. MS 2327 f168v–177; AG 107–12, 115–18. Translation based on T (4).

2. *Shat apatha-B.*, i 9, 2, 21; cauldron of renewal: JL (5).

3. Eliade (6) 171 and 153–6; *Kausitaki B.* iii 8; *Ait. B.* ii 40, 1–7; *Satapatha B.* vi 1, 2, 12. "With his joints unstrung he was incapable of standing up, and the gods put them together again by means of sacrifices," *Sat. B.* i 6, 3, 35 f; the priest repeats the creation, "he reunited Prajapati totally and entirely," *Sat. B.* vi 2, 2, 11. Heesterman (1) 7, 61, 17 ff, 67; sacrifice as universe, 10, 29 etc.; union of male and female waters 86 ff; marriage with the people 52 ff; purification of waters by gold 87; Hocart 189 ff. Navel: Auboyer 79 ff; Gonda 84 ff; Eliade (7) 27–56. Chalkos: Jeanmaire, RA 1956 xlviii 30

4. Forbes (1) iii 15 f.

5. Butler 81; Palmer and More 16.

6. Dickie. I owe Prof. Dickie thanks for bringing this item to my notice. *Sarcolla*: Diosk. ii 281; iii 329, resin of a tree of Persia, bitter and malodorous. Verses: *Qur'an* xliv 10 f.

7. B (1) 236 f.

8. Budge (3).

9. Olymp. 2327 f210; Mark f174v. Mercury: 2327 f95. Osiris as lead and sulphur: Steph. 2327 f 21. Tomb of O. in magic conjurations: Leemans 1939 (1st issue) 7. In gen., T (1) 54. Assyrians and Babs. named lead Anu after the skygod with some likeness to Kronos.

10. See ch. vii n. 50; Stapleton (4) 34 and 40. Zos. knew Ag.'s work: Stapleton 26. Sal ammonia known to Assyrian cuneiform texts: C. Thompson (2) 12; Partington (1) 147, 317; Stapleton 34 n. 68; Lippmann (1) iii 116. It seems used first in Iranian alchemy in Sassanid times; thence to Chinese, Indian, Arab, and Greek alchemy: Ruska (10) and (11). Arab *nusjadir* is from Iranian *noshadqr*: Corbin 53 n. 15. Stapleton tries (6), cf. (8), to show Iranian *noshadar* and Sanskrit *navasara* are from Chinese *nau-sha*. This is incorrect: Laufer (3) 505; Eliade (1) 194 f.

11. Many more small points about Zos. might be followed out; but I do not want my main points to be blurred by discussing small obscure interpretations, substances etc., though further details come up in c. xvii.

For Zos. the Theban and *On the Letter Kappa*, see B (3); Scott 1936 iv 140 and 143; Doresse 278.

## XVII. THE LATER GREEK ALCHEMISTS

1. *C. Cels.* iii 59; I Cor. ii 6, 7; *Mark* iv 34; *Matth.* x 26 f; W. B. Smith 34–45.

2. Gavin 70 with refs.; Lietzmann 235; Völker 136. Power: Lietzmann 107 and 235 ff; Gavin 93 and 77; *Did.* x 4; *Ps.* lxi 12; *Wisd.* xi 24. Immortality in this context: Sarapion *anaphora* 13:15; Lietzmann 76; Gallic liturgy *ib.* 96; Berl. pap. *ib.* 257 n. 2, cf. 235, 257; in general Völker 106 f.

Cf. Egyptian coronation rite: Smith pap. xxi, 9; xxii, 7–10; xx 1, 3–8; Breasted (3) 482 and V. Loret.

3. Greg. Naz 1, 1020a; 2, 328c, cf. 2, 440a; i, 757c. Also Euseb. HE 853a. Sublime medicine: Greg. 2, 549b; Guignet 146.

4. MS 2327 f222; Mark f 62v. Pelag. is cited by Olymp.

5. Areometer: Glover 323 f. Dreams: 1285ab; Lacombrade 152: Dion 1 69. Demok. only cited once, banally, in his work: Lacambrade 70 n. 32. Hymn: ii 59 ff. Indeed Synesios shows much the same sort of exalted vague antitheses as Stephanos. Hymns i 191 ff, "You are the child produced, you are the unbegotten . . . You are the displayed, you are the hidden," etc.; ii 80 ff, "I hymn you blessed one by voice and by silence," v 63, "you are father you are mother you are husband you are wife . . ." Synesios and Chaldeans: Lewy (2) 73, and his Egyptian myth, 305 ff; Syn. on daimons and on *pneuma* as *psyche phantastikē*. Lacombrade 166 f.

6. AG 63 and 65 etc; MS 2327 f31; T(2) 120; AG 56.

7. *Souida: Androkleides;* Lacombrade 71 n35.

8. B(1) 254ff; Mark f 166v; B(1) 193; AG 69; F(1) i 281; T(2) 120f; MS 2327 f197; Hoefer i 273. Abundance of Ocean: see JL (5) 104f.

9. Arche as beginning or origin in Homer and Hdt.; as principle in Anaximandros, acc. to Simplik. *in ph.* 150, 23.

10. Earth is here considered as one of the four elements, as an *arche*.

11. Here he slips into conventional tribute to "theologians," but the whole bias of his formulations as of those of Zos. is to pantheism, god as the formative and active aspect of matter or process. For Unmoved Movers in Aristotle: *metaph.* ch. 8 (1073b 3 ff); Lloyd (2) 147–53. For materialism of Stoics: Merlan (2) 124 fi;. materialist trends in Theophrastos, 111.

12. Muses: 2250 f69; oracles 2327 f210; Isis, 2327 f219; gold 2250, f123, cf Plin. xi 21 and xxxii 4, 21; Solin. xxx; Philost. VAT v 1; Hdt. iii 102. His Gnostic speculations seem from Zos. For the Arts and gold, note Kallimachos' *lambi* xii 58–9 (Loeb): winged ants.



13. Kings: 2327 f206; see also 207 f. Months: B (1) 195; 2327 f206.

14. MS 2327 f 199; Mark f165; B (1)194.

15. Kopt cod. liv pub. by Zoega 100 f; spell, L. and L. spellbook xxii (2), v 15; Lexa ii 144. In gen. Revillout RHR viii (4ths.) 146, 431, 434 For Dioskoroi: see J. Maspero, index: *Dioscores*.

16. *Mart. Rom. Vet.* Adonis, Usuardi; patriarch, *Cal. Ethiop.*

17. F (7) 78 ff for detailed investigation. I see no reason to doubt the tradition that Kallinikos of Heliopolis played a crucial part in developing Greek Fire. Partingdon (1) 13 thinks it prob. that chemists in Byz. devised it; but we have no evidence of such groups there while it is clear there was much alchemical activity in Syria.

18. B (1) 202–5; AG 395, 399; ii 405, 407, 409 f, 414 f. T (2) 121. MS 2327 f92 on; 2249 f6; Mark f101, 110 etc. Cited in *Kitab.* Citations: 2327 f100, f95, f98, f103v, f105, f112.

19. Steph.: Krumbacher 621, holds alchemic works to be late; Usener too, 1879 and 1880 (*de Steph. Alex.*); Kind thinks the alchemists to be 9th c.: Lippmann (1) ii 204. Usener thinks Steph. could not have lectured publicly on alchemy, but this was not the 4th c.: Lippmann i 103 ff.

Fabric. vi ch. 7; xii 694, identified with Stephanos of Athens who left medical works; one of the seven compilers who coll. works of Galen in 16 books; also Bussemaker and Dietz (*schol. in Hippoc. et Galen*, i 1, pref. xix). But the argument is not strong. Stephanos in middle ages in *Allegoriae Sapientium* (*Bibl. Chen.* i 472–8), an opuscule where Herakles (? Heraklios) addresses Steph. of Alexandria. Alex. schools survived Arab conquest till c. 700: M. Meyerhof, *Von Alex. nach Bagdad* 1930.

20. Pizzamente, Latin paraphrase 1573; T (4) Ideler ii 199–253; R (6); Lagercrantz CMAG ii 338, with letter to Theodoros interpolated between 2nd and 3rd lectures: T (4) 46 n. 72. I make much use of Taylor's version.

21. Fireless sulphur: *theion apyron*, used for sulphur, but Zos. mentions a whitening agent: ? orpiment. Becoming like Ocean: *Okeanizousa*. Perfection (of soul): Pizz. translates exaryisma as appendix. Gold-roofed: ? *chrysorrhophon*: Pizz. has: *O auri fluens caelestis* fons. Gold curls: *chrysozōmion bostrychon*: Pizz has *auream gerens caesariem*.

22. T (4); MS 2327 f122; B (1) 228 f. Released by death: apothanatosē.

23. AG 35, 18 and 272–5.

24. Note *aetites*, eagle-stone had two sexes (Plin. xxxvi 149–51; Ail. NA i 35; Diosk. v 160; Solin. xxxvii (Momm. 159, 9); BC ii 200–7 and 195; *Gep.* xv 1, 30; Damigeron i 324 and 163 (Pitra, *Spicil. Solesm.*); aids pregnancies and births; has a small stone inside a larger. Eagle as Year: BC ii 332 n. 4.

25. *Phengites*: In classical lit (Plin., Suet.) a hard stone, possibly only marble (Bailey 268); Steph. probably uses it as equiv. to Moonstone; not in other alchem. texts. Gold-coral: recipe of Demok. (AG 44, 4); its making (AG 56, 16); seems a pigment or coral-like ornamental material. Lapis corallus BC ii 199, with power against lightning, typhones (?) and water-snakes: Damig. ch. vii; also fertility-effect: against winds. Ouranos-sign: T (4) 46 n. 85; Zuretti 23 f (signs 1267; 1313). Emperors: T (2) 122 n. 7. Two stones, 2 vapours: Stapleton (5) 83, 88 f, 90. For Pythag. idea of One embracing Odd and Even: Aristot. *met.* A5, 986a 15 ff; link with male and female, 986a 23 ff; F (1) iv 48 f.

26. Anon: 2317 f162; Mark f78; AG 421, 424, 433.

27. T (2) 122; Pappos, AG 27 (*orkos*); Salmanes, 864; Psellos, MS 2328 f10, 3027 f52, 2327 f1, CMAG vi; Nikephoros AG 452; Lexikon AG 4.

28. Browne (1) (2) (3). I use his translation as basis. Ideler ii; Fabric. iv 790–7. R. and Goldsmidt propose Heliodoros as author of all the poems. His work is ded. to Theodosios the Great King. On style: R (9) and Browne (3) 15–87.

Ruska takes Djabir b. Haiyan as founder of Moslem alchemy; see also Haschmi etc.

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## XIX: CONCLUSIONS

1. Dion xii 33 f; vii 31, cf. Plout. *de tranq.* xx; Cic. *leg.* ii 11; Phil. *spec.* i 66 etc. Idea of maths, (and star-contemplation) as initiation: *Epinom.* 986b–8d4. Sen. QN vii 31.

2. Toulmin, *Listener* Feb. 11 1960 & *Philosophy of Sc.* 1953.

3. A. C. Crombie *discovery* (Aug. 1962) 24. on Aristotelian law of motion giving the proportional relation of velocity to force or power of the moving agent; this could not explain a projectile's velocity after it left the agent of propulsion or what increase in power occurred to make a heavy body accelerate as it fell. See A. Lejeune for virtues and limits of ancient method, esp. 184–6. Carrucio for struggle of the Greeks towards the integral calculus.

4. Bernal 238 f, *Science in History* 1954. Philoponos: Sheldon-Williams 477 ff, with refs.

5. *Nat. Fac.* ii 3 (82).

6. Weight: Browne (1) 211.

7. Lloyd on Plato and esp. relation to medical science. Medicine needed to refer to practice and actual cases, but did not attempt to re-create phenomena under tested conditions. With the new dynamical concepts of the Stoics we feel that men could have got past the geometrical outlook of Plato; but the "swerve" of Epikouros (introduced into the atoms for moral reasons) seems the only addition made. See Sambursky (1) 70 ff on Impetus; Hipparchos and storage of power, 71, 74. Note how Philoponos links his concept of Impetus with colour-tincting. "Indeed, we can see from the colours which stain corporeal bodies exposed to them, that certain forces of an incorporeal form are emitted when the sun's rays pass through a transparent coloured object . . . It is thus evident that certain forces can reach bodies in an incorporeal way from other bodies." *Phys.* 642, 9.

8. See my *Sunset Ship* and Lives of Turner and Cézanne. 1650–80: J. Ferguson, *J. of the Alchemical Soc.* 1914 ii 5.

9. Whyte, *Unitary Principle in Physics and Biology* 1949, 15 f.

10. As I type this last chapter, I note the comment by E. H. Hutton (*New Scientist* 21 Dec. 1967, "The investigation of elementary particles lies outside the scope of quantum mechanics. It has more resemblance to the ways in which the internal structure of living cells is revealed. Comparison between physics and biology, at the present stage of development, should be useful. It may help us in constructing a new model for the elementary particle, just as previously we learned a new meaning for 'atomicity' through quantum mechanics, going beyond the simple concept of chemical atom."

# Bibliography

Special abbreviations here used: AG = Alchimistes Grecs (Berthelot, Coll.); B = Berthelot; BC = Bidez-Cumot, *Les Mages hellénisés*; CH = Corpus Hermeticum; F = Festugière; HT = Hermes Trismegistos; R = Reitzenstein; S = Sambursky; T = Taylor.

Allbright, *J. Am. Or. Soc.* xxxix 1919 65–90. Alleul, R., *Aspects de l'Alchimie Traditionelle* 1953. Ambix, *Journal of Soc. for Study of Alchemy & Early Chemistry*. Amelineau, E., PSBA x 1877–8. Angus, S., *The Religious Quests of the GR World* 1929. Anon, *Copper through the Ages* 1958 (Copper Develop. Assn.). Anton, J. P., *Aristotle's Theory of Contrariety* 1957. Anz, *Zur Frage nach d. Ursprung d. Gnostizismus*. Armstrong, A. H. (1) ed. *C.H. of Later Cr. & Early Med. Philosophy* 1967 (2) in (1) pt. iii, Plotinus (3) *The architecture of the Intelligible Universe in the Philos. of Plot.* 1940. Atwood, M. A., *A suggestive Inquiry into the Hermetic Mystery* 1920. Auboyer, J. *Le Trône et son Symbolisme dans l'Inde anc.* 1949. Audin, A, *Les fêtes solaires* 1945. Audollent, *Defixionum Tabellae.*

Babelon, J., *Mon. Piot.* xxxviii 1941 117–28. Bachelard, G., *La Terre et les Rêveries de la Volonté* 1948. Badawi, A. M., *Der Gott Chnum* 1937. Badenhewer, O., *Gesch. d. altkirch. Lit.* Bailey, K. C., *The Elder Pliny's Chapters on Chemical Subjects* 1929–32. Barb, A. A., in Momigliano. Baudissin, W. W. Graf von, *Kyrios*. Baumstark, *Gesch. syr. Lit.* Baynes, H. N., *Coptic Gnostic Treatise* (Cod. Bruc.) 1933. Bell, H. I. (with Nock & Thompson), Magical Texts . . . *Proc. Brit. Acad.* xvii. Benvéniste (1) *The Persian Religion acc. to the chief Gr. Texts* 1929 (2) RHR cvi 1932. Berthelot, A,. *Das Geschlecht d. Gottheit* 1934. Berthelot, M (1) *Les Origines de l'alchimie* 1885 (2) *Coll. des anc. Alch. gr.* 1887–8 (3) *La Chimie du M. A.* 1893 (4) *Intro. à l'Et. de la Chimie des Anc. et M.A.* 1889. Bhagvat, R. N., *J. of Chem. Educ.* x 1933 661. *Bickermann*, E., *AfRel.* xxvii 1929, 1 ff. Bidez, J. (1) with Cumont, *Les Mages hellénisés* 1938 (2) *Ann. Inst. Phil. Hist. Or.* iii 1935 41–89 (3) *Byzantion* xiii 1938 43–53 (4) *Rev. Phil.* 1903 xxvii 81 (5) *La Cité du Monde chez les Stoiciens* 1932 (6) *Mél. Capart* 1935 (7) *Bull. Ac. r. de Belge* cl 1933 203 ff (8) *ib.* 1935 257f (9) *Vie de l'emp. Julien* 1930 (10) *Un singulier naufrage . . . à la recherche des épars de l'Aristote perdu* 1943. Bignone, E., *L'Aristot. perduto e la formazione d'Epicuro* 1936. Bin Gorian, *Die Sagen d. Juden* 1935. Biot, E., *J. asiatique* 1835 xvi 130–54. Blochet, *Et. sur le Gnosticisme musulman* 1913. Bluemner, H., *Tech. u. Term. d. Gewerbe u. Kunste bei Gr. u. R.* iv 1887. Blum, Claes, *Studies on Dream Book of Artemidorus* 1936. Boas, G., *The Hieroglyphics of Horapollon* 1950. Bochner, S. (1) *The Role of Maths. in the Rise of Science* 1966 (2) topos, *Acts X Cong. Hist. Sc.* (Ithaca 1962) 471–9. Bodde, D., *J. Am. Or Soc.* 1939 lix 200. Boissier, *La Fin du Paganisme*. Boissonade, ed. Eunap. *Vit. Iamblichus*. Boll, F. (1) *Sphaera* (2) *J. f. C.P.* Suppl. xxi 1894 155 ff (3) *Aus d. Offenbarung Johannis* 1913. Bömer, F., AfR (Beiheft 1) 1943. Bonner, C. (1) *Studies in Magical m Amulets* 1950 (2) HTR xxxix 30 ff. Boston, G., *Les metaux et les pierres dans les inscr. assyro-bab.* 1934. Bouché-Leclerq, *L'Astrol. gr.* 1899. Boulanger, A., *Orphée* 1925. Bousset (1) AfR iv 136–69, 229–73 (2) AfR xviii 1915 134–72 (2) *Hauptprobleme der Gnosis* 1906 (4) *Kyrios Christos* 1913 (5) *Die*

*Himmelreise d. Seele* Afr 1901. Boyancé, P. (1) *Mél. Arch.Hist Rome* lii 1935 95–112 (2) REA liv 1942 191–216 (3) *Et. sur le Songe de Scipion* 1936 (4) RA 1929 211–9 (5) REA 1934 323 (6) *Le Culte des Muses dans les philosophes gr.* Boylan, P., *Thoth the Hermes of Egypt* 1922. Breasted, J. H. (1) *Religion & Thought in Anc. Eg.* (2) *Rec. Champollion* 1922 (3) *E. Smith pap.* 1930. Braüninger, *Unters. zu d. Schriften d. HT* 1926. Bréhier, E. (1) *Chrysippe et l'anc. Stoicisme* 1951 (2) *The Philosophy of Plotinus* 1958 (3) La *Théorie des Incorperels dans l'anc. Stoic.* (2nd ed.) 1928. Brendel, *Symbolik d. Kugel* (Arch. Beit. zu Gesch. ält. gr. Philos., RM 1945) 322. Bretschneider, E., *Botanicon Sinicum* 1881–95. Brouwers, P., *Mél. St Joseph* xli 1965 fasc. 3. Brown, J. C., *Hist. of Chem.* (2nd ed.) 1920. Browne, C. A. (1) *Scientific Monthly* NY 1920 193–214 (2) *Ambix* ii 1946 129–38 (3) iii 15–25. Brugsch, *Religion u. Myth. d. alt. Aeg.* Bryan, C. P., *The Pap. Ebers* 1930. Bywater, I., *J. of Philology* 1877 vii 64 ff. Budge. E. A. W. (1) *Amulets and Superstitions* 1930 (2) *The Divine Origin of the Craft of the Herbalist* 1928 (3) *Book of Dead*, Theban Resc. 1960 (4) *The Paradise of the Fathers* 1907 (5) *From Fetish to God* 1934 (6) *Osiris and the Eg. Resurrection* (7) *Eg. magic* 1901. Buren, van (1) *A.f. Or. Forsch.* x 1945–6 53 (2) RA i 1920 131f. Burland, C. A., *The Arts of the Alchemists* 1967. Bury, R. G. *Plato, Tim.* (Loeb) 1929. Bussemaker, R. *de Philol.* 1845 i 415. Butler, E. M., *The Myth of the Magus* 1948.

Cadiou, R., *La Jeunesse d'Origène* 1935. Caley, E. R., *Analysis of Anc. Metals* 1964. Carbonelli, G., *Sulle fonti storiche della chimica e dell'alchimica in Italia* 1925. Carcopino, J., *La Basilique pythag.* Carrucio, E., *Maths. & Logic in Hist. & Contemp. Thought* 1965. Casel, O., RGVV xvi 2, 1919 (silence). Caster, M., *Lucien et la pensée relig. de son temps* 1938. Chabouillet, *Cat. Bibl. Nat.* Paris. Chadwick, H., in Armstrong (1), Philon. Charbonneau-Lassay, L., *Bestiaire du Christ* 1940. Charles, R. H. (1) *Apoc. and Ps. of OT* 1913 (2) *Apoc. of Baruch* 1896. Cherniss, H. (1) *J. Hist. of Ideas* 1951 xii (2) *Aristotle's Criticism of Presoc. Philosophers.* Chikashige, M., *Oriental Alchemy* 1936. Christesen, A., *Le premier homme et le premier roi dans l'hist. leg. des Iraniens* 1918. Chwolsohn, D. A. (1) *Die Ssabier* 1856 (2) *Sur les Débris de la vielle Lit. Nabathéenne.* Clarke, Rundle, *Myth and Symbol in Anc. Eg.* 1959. Cline, *Mining and Metallurgy in Negro Africa.* Coedes, G., *Textes d'auteurs gr. et lat. rel. à l'Extrême Orient* 1910. Cohen-Drabkin, *Source Book in Greek Science* 1948. *Contenau,* G (1) *La Magie chez les Assyriens et les Bab.* 1947 (2) *Notes d'Iconog. relig. assyr.* Cook, *Zeus.* Cornford, F. M., *The Laws of Motion in Anc. Thought* 1931. Couling, S., in *Enc. Sinica* (astrology). Courcelle, P., *Les Lettres gr. en occident de Macrobe à Cassidore* 1943. Croissant, J. AC 1945 61–94. Crutwell, C. T., *A Lit. Hist. of Early Christianity* 1893. Cumont, F. (1) *L'Eg. des Astrologues* 1937 (2) *Afterlife in* R. *Paganism* 1922 (3) *Textes et Mons. Mith.* (4) *Mystères de M.* (3rd ed.) 1913. (5) CRAI 1945 386–420 (6) *Recherches sur le Symbolisme funéraire* 1942 (7) *Rev. de Philol.* xlii 1918 55 ff (8) *Mon. Piot* xxv 1921–2 (9) *Astrology and Religion* 1912 (10) RHR ciii 1931 52 ff (11) *Mysticisme astral* 1909 (12) *Or. Relig.* (13) *Mél. Dussaud* 1939 (14) HTR xxvi 1933 151 ff.

Darmesteter, *Et. iran.* ii 1883. Davis, O., R. *Mines in Europe.* Davis, T. L. (1) *Harv. J. Asiat. St. vii* 1942 (2) *Isis* xxviii 73 (3) *J. Unified Sc.* ix 1939 7 (4) *Isis* xxv 327 (5) P. *Am. Ac. Arts Sciences* lxxiii 97 (6) *J. Chem. Educ.* 1935 3 (7) *Sc. Monthly* xliii 551 (8) as (5) 1935. Davis, W., *The Story of Copper* 1925. De Groot, J. J. M. (1) *Religion in China* 1912 (2) *Relig. System of China* 1892–1900. Delatte, A. (1) BCH xxxviii 258 (2) see Derchain (2) (3) *Mus. Belge* 1914 75 (4) *Anec. Ath.* 1927 444 (5) *Et. sur la litt. pythag.* 1915 (6) *Herbarius* 1961 (7) *Les Conceptions de l'Enthousiasme dans les phil. présoc.* 1934 (8) *La Vie de Pythag.* 1922 (9) *Textes latines* etc. (10) *Mus. B.* 1924 (11) *Le Cycéon* 1955. Delcourt, M., *Hermaphrodite.* Deonna, W. (1) *Le Symbolisme de l'Acrobatie* 1953 (2) RA 1920 i 130 (3) *Bull. Inst. Nat. Genevois* lxxii 1917 (4) *Artibus Asiae* xv 1952 163. Derchain, P. (1) CE xxxix 1964 177–93 (2) with Delatte, *Les intailles magiques gr.-eg.* 1964 (3) *Dialoog* 1962 171–89 (4) *Pap. Salt 825,* 1965. Des Places, E., *Jamblique. Les mystères* 1966. Dickey, J., *Al-Andalus* xxix 1964 243–310,



esp. 274 f (ibn Shuhaid: biog. and crit. study). Diels (1) *Himmels u. Höllenfahrten* (N.J. f.d. Kl. Alt 1922) 239 ff (2) *Antike Technik* 1914 (3) 2nd ed. 1920 (4) *Doxog. gr.* (5) *Archiv f. Gesch. Philos.* vii (6) *Vorsokr.* (7) with Schramm, *Excerpta aus Philons Mechanik* 1919. Dieterich, A. (1) *Mithrasliturgie* (3rd ed.) (2) *Abraxas* 1891 (3) *Kleine Schriften* 1911. Dill, S., *Roman Soc. from Nero.* Dilthey, *Rhein. Mus.* xxvii 375 ff. Dod, C. H., *The Bible and the Greeks* 1955. Dodds, E. R. (1) *Essays . . . to G. Murray* 1936 369 ff (2) *Greeks and Irrational* 1959 (3) *Sources de Plotin. Entretiens* 1960 v 3–32. Dölger, F. J., *Antike u. Christentum* i-v 1929–36. Doresse, J. (1) *Secret Books of Eg. Gnostics* 1960 (2) *La Table Ronde* no. 110 Feb. 1957 (3) *Vigiliae Christ.* ii 241 (4) NT i 1956 (4) *Les livres secrets* etc. 1958. (5) *Bull. Inst. d'Eg.* xxxii 1949–50 364–5. Dornseiff, *Das Alphabet in Mystik u. Magic* (*Stoicheia* vii 1922). Dressel, H. F. with R. Hochberg, *Drug & Cosmetic Industry* ii 1941 386–8, 393, 395. Drexler, Roscher II i 1260–3 (kniphis). Drioton, E., ASAE xliv 1944 111–62. Dubs, H. H. (1) *Isis* xxxviii 75 (2) *Ambix* ix 1961 23–36. Duhem, P. (1) Le *Système du monde* 1913–7 (2) *Sozein ta pheuomena* 1908 (3) *Les Origines de la Statique* 1905–6. Dussaud, Mon. Piot. 1933 3 ff (2) *Civilisations préhelleniques.* Dutilh, E. D. J., *Rev. belge de num.* 1905 155–64.

Edelstein, J. L. & L., *Asclepius* 1945. Edkins, J., *Religion in China,* 1893. Edsmann, C. M. (1) *Ignis Divinus* 1952 (2) *The Body and Eternal Life* 1946 (3) *Le Baptême de feu* 1940. Eicholz, D. E., *Theophrastus De Lapidibus* 1965. Eisler, R. (1) *Die chem. Terminol. d. Baylonier* (2) *Chem. Zeit* xlix 1925 577, 602 (3) *Orph.-Dionys. Mysteriengedanke.* Eitrem, S. (1) *Les pap. mag. de Paris* (Vidensk. F. 1923) (2) *Symbol. Osl.* iv 1926 39–59; v 1927 (3) *ib.* x 1932 311 xi 11; xv–xvi 111 (4) *ib.* xxii 49 (5) *Mysteriereligionioner Antikken* 1942. Eliade, M. (1) *The Forge and the Crucible* 1962 (2) *Chamanisme* (3) *Traité d'Hist. des Religions* (4) *Cosmologie si alchimie babyloniana* 1937 (5) *Le Yoga* (6) *The Two and the One* 1965 (7) *Images and Symbols* 1961. Ellis, E. S., *Anc. Anodynes* 1946. Erman (1) *Die Relig. d. Aeg.* 1934 (2) with Ranke, *Aegypten* 1923 (3) *Sitz. Ber. Berlin* 1911 (4) with Grapow, *HB d. Aeg. Sprache* (5) *Abh. k. preus, Ak. Wiss. Berl.* 1897 (6) *Lit. of Anc. Egypt* (Blackman) 1927 (7) *Die Welt am Nil* 1936. Evola, J., *La Tradizione Eremetica* 1948.

Fabricius, H., *Bibliotheca Graeca,* esp. viii 1802. Farrington (1) *Science and Politics in Anc. World* 1939 (2) *The Faith of Epicurus* 1967 (3) *Greek Science,* Fendt, L., *Gnost. Mysterien* 1922. Ferguson, J., *Bibliotheca Chemica* 1906. Festigière, A. J. (1) *La Révélation d'HT* 1944–54 (2) *HT, Corpus Hermet.* 1960, 1954 (3) HTR (aretologies Isis) (4) RA xxix–xxx (*Mél. Picard*) 1949 376 (5) *Rev. Bibl.* xlviii 1939 45 (6) REG 1949 235 (7) AC viii 1939 71 (8) *Short Hist. of the Art of Distillation* 1948 (9) *Pisculi* (10) *Mus. Helvet.* vi 1950 211 (11) *Mon. Piot* xxxviii 1941 (12) *L'Idéal relig. des Grecs et l'Evangile* (13) *Recherche de sc. relig.* xxviii 1930 2, 175 (44) *Mém. Lagrange* 1948 125 (15) *Personal Religion among the Greeks* 1960. Figuier, L., *L'Alchemie et les Alchemistes* 1856. Filliozat, J. (1) RH 1949 xxi 1 (2) *La Doctrine classique de la Médicine indienne* 1949. Flemming-Radermacher. *Or. christl. Schriftst. B.d.V.* 1901. Forbes, R. (1) *Studies in Ancient Technology* (2) *Man the Maker* 1950 (3) *Archives int. d'Hist. des Sc.* no 12 1950 599–618 (3) *ib.* i 1948 557–73 (4) *Metallurgy in Antiquity* 1950 (5) in Mahdihasan (1) 94 f. Foote, P. D., *Sc. Monthly* 1924 xix 239–62. Freeman, K. (1) *Pre-Soc. Philosophers* (2nd ed.) 1949 (2) *Ancilla* 1948. Friedländer, P., *Structure and destruction of the atom according to Plato's Timaeus* (Univ. Calif. Pub. Phil. xvi) 1949 225–48. Frutiger, P., *Mythes de Platon* 1930. Fück, J. W., *Ambix* iv 1951. Furtwängler, Roscher i 419.

Ganschinietz (Ganzyniec) (1) RE Suppl. iii 51 ff (2) *Hippolytos Capitel gegen die Magier, Ref. Haer. iv 28–42* 1913 (3) *De Agathodaimone* 1919 (4) RE *sv katabasis.* Ganzemuller, W., *Chymia* iii 1950 143–55. Gardiner (1) with Sethe, *Eg. Letters to the Dead* (2) with Cerny, *Hieratic Ostraka* (3) *Grammar.* Garland, H., with C. O. Bannister, *Anc. Eg. Metallurgy* 1927. Garnsey, P., *Past & Present* xli 1968 3–24. Gavin, F., *Jewish Antecedents of Christian Sacrament* 1928. Gazza, *Aeg.* xxxvi 1956 73 ff. Geffeken, J.,

STOKE-ON-TRENT CITY LIBRARIES

*Das Ausgang d. gr. röm. Heidentums* 1929. Ghalioungui, P., *Magic and Med. Sc. in Anc. Eg.* 1963. Gigon, O., *Universitas* i 1946 1073–84. Gildermeister, J., *Z.f. d. Morgenländ. Gesellschaft* xxx 1876 534. Giles, A. H., *Chuang Tzu*. Giles, L., *Taoist Teachings* 1912. Goldschmidt, G., *Religionsgesch. Versuche u. Vorb.* xiv 2 1923 (2) *Der Ursprung d. Alchimie* (Ciba S. v 1938) 1950–88 (3) *Cahiers de Frontonex* 1947 101–26. Goldschmidt, V., *La Système Stoic. et l'Idee de Temps* 1953. Gomperz, H., *Hermes* lviii 1923 20–56. Gonda, *Aspects of Early Vishnuism* 1954. Goosens, G. (1) *New Clio* 1949 1–2 32–44 (2) *Ann. Inst. Phil. Hist. Or.* iii 1935 41–89. Gottheil, R., *Class. Stud. in hon. H. Drisler* 1894. 24–32. Gôtze, A., *Die Schatzhöhle* (Sitz. Heidel. 1922, Abt. 4). Gowland, W. (1) JRAI xlii 1912 235 (2) *J. Inst. Metals* vii no. 1 1912 (3) *ib.* iv no. 2 1910 4. Graesse, J. G. T., *Beit. z. Lit. u. Sage d. Mittelalters* 1850. Grande, C. del, *Poesia ermetica nelle Grecia antica* 1937. Granet, M. (1) *La Pensée chinoise* 1934 (2) *Danses et Legendes de la Chine ant.* 1926. Grant, R. M., *The Secret Sayings of Jesus* 1960. Grierson, P., in Carson & Sutherland, *Essays in* R. *Coinage* 1956 ch. xiv. Griffith (1) *Stories of the High Priests* (2) see C. Thompson. Guignet, M., *S. Gregoire de Nazianze* 1911. Gundel, H. (1) *Neue astrol. Texte d. HT* 1936 (2) *Dekane . . . Dekansternbildung* 1936 (3) RAC (Alchimie).

Halliday, W. R. (1) in *Gr. Poetry and Life* 1936 277–94 (2) *Gr. Divination*. Hammer-Jensen, I. von (1) *Die ält. Alchimie* 1921 (2) RE Suppl. Bd. iv 219. Hanbury, D., *Science Papers*. Harder, R. (1) *Karpokrates von Chalkis* 1944 (2) *Philol.* lxxxv 1929–30 243 ff. Harmann, A., *Z.f.Aeg. Spr.* 1954 lxxix 99–106. Harris, J. R., *Lexicog. Studies in Anc. Eg. Materials*. Harrison, Jane, *Prolegomena*. Haschmi, M.Y., *Ambix* ix 1961 155–61. Heath, T. (1) *Maths in Aristotle* 1949 (2) *Manual of Gr. Maths.* 1931. Heesterman, J. C., *Anc. Indian Royal Consecration* 1957. Heidel (1) *Cl. Philol.* 1906 279 (2) *Harv. Stud.* 1911 135. Heinze, B., *Terullians Apologet.* (Berichte Verb. d. k. Sächs. Gesell. Wiss. lxii 1910) 281–490. Herzog, R., *Philologus* Suppl. Bd. xxii 3, 1931. Hilgenfeld, A., *Die Ketzergesch.* d. Urchrist. 1884. Hiortdahl, T., *Christiana Videnskabss. Skr.* 1905, 1, vii. Hirth, F. (1) *China and R. Orient* 1885 (2) *Anc. Hist. of China* 1911 (3) with Rockhill, *Chau Ju Kua* 1911. Hocart, A. M., *Kingship* 1927. Hoch, G., *Gr. Weihegebräuche* 1905. Hoefer, *Hist. de la Chimie* (2nd ed.). Hoffmann, G., *Ladenburgs HandWB d. Chemie*, ii 516 ff. Holmyard, E. J. (1) *Works of Geber* 1928 (2) *Avicennae De Congeliatione* etc. with Mandeville 1927 (3) *Abu'l-Qasim Muhammadibn Abmad al-'Iraqi, Kitab* etc. 1923 (4) *Makers of Chemistry* 1931 (2) *Alchemy* 1957 (6) *The Gr. Chemists* 1928 (7) *Nature* cxii 1923 (8) *Isis* viii 1926. Hombert, P., AC xiv 1945 319–29. Honn, K., *Stud. z. Gesch. d. Himmelfahrt.* Hopfner, T. (1) *Gr. aeg. Offenbarungzaube* (2) *Ueber die Geheimlehren von Iamblichus* (3) RE xvi 2218–2333 (4) *Der Tierkult* 1913. Ho Ping-Yu, with Needham, JWCI 1959 173–210. Hopkins, A. J. (1) *Sc. Monthly* vi 1918 530–7 (2) *Chem. News* (lxxxv) 49 (3) *Alchemy Child of Gr. Philosophy* 1934 (4) *Isis* 1925 vii 1, 58–76 (5) *Studien Festgrabe E. O. V. Lippmann* 1927 9–14. Horten, *Die Philosophie des Islam* 1924. Howey, M. O., *The Encircled Serpent* 1926. Hubaut (1) with Le Roy, *Le mythe du Phénix* 1939 (2) AC 1932 375–94. Hultsch. *Metrologic. script. sel.* 1864. Hughes. E. R., *Chinese Philosophy in Class. Times* 1942. Hughes, G. R. (1) JEA 1968 176–82 (2) JNES xvii 1958 1–21. Hutin, S., *A Hist. of Alchemy* 1962. Huxley, G., *The Interaction of Gr. & Bab. Astronomy* 1964.

Ideler, J. L., *Physici et Chemici Gr. Minores* 1841.

Jahn, A., *Rev. de philol.* xv 1891 101–15. James M. R., *The Apocryphal NT.* Jensen, J. H., *Die ält. Alchimie* 1921. Jeremias, *HB d. altor. Geisteskultur* 1913. Joachim, H. H. (1) *J. of Philol.* xxix 1903 72–6 (2) *Nicomachean Ethics* 1950. Johnson, A. C., *Roman Egypt.* 1959. Johnson, O. S., *A Study of Chinese Alchemy* 1928. Jonas, H. (1) *The Gnostic Religion* 1958 (2) *Gnosis u. spät. Geist* 1964–5. Jung, C. G. (1) *Psychologie u. Alchemie* 1944 (xii of *Coll. Works*) (2) *Psychology and Alchemy*, transl. Hull (3) *Wurzeln d. Bewusstseins.*



Kahane, H. & R., *The Krater and the Grail* 1965. Kaltenmark, M. (1) *Bull. Centre Etudes Sinolog. de Pékin* iii 1948 1–113 (2) *Le Lie-sien tchouan*. Karo, G., AfRW vii 1904 142 ff. Kees, H. *Bemerkungen zum Tieropfer d. Aeg. u. seine Symbolisk* 1942 (2) *Götterglauber d. Aeg.* Kerenyi, C. (1) *Eleusis* 1967 (2) *Die Jungfrau u. Mutter* (3) *Gr. Miniaturen*. Kern, O., *Orphica*. Kind, RE 3A ii 2404. King, *Gnostics*. Kirk, G. S. (1) with Raven, *The Presoc. Philosophers* 1957 (2) *Heraclitus, the Cosmic Fragments* 1952. Kirk, W. C., *Fire in the Cosmolog. Speculations of Heraclitus* 1940. Kleinknecht, ARW xxxv 1938 114 ff. Kock, C., *Fuglen Føniks* 1909. Kopp, H. F. M., *Beit z. Gesch. d. Chemie* 1843–7. Kraeling, C. H., *Anthropos and Son of Man* 1927. Kranz, W., *Kosmos u. Mensch in d. Vorstell. frühen Griechent.* 1938. Kraus, P., *Jabir ibn Hayyan* 1942–3. Kroll, J. *Gott u. Hölk* 1932. Kroll, W. (1) with Pieper, RE xvi 2 1935 (2) *Die Lehren d. Hermes Tris.* 1914 (3) *Orac. Chald.* 1895 (4) *Hermes* 1934, Bolos (5) *Rh.Mus.* lxxi (6) *Die relig. Bedeutung d. Poseidonios* (NJ f.d.kl. Alt. xlix) 1917. Kropatschek, *De amulet. apud antiquos usu capita duo* 1908. Krumbacher, K., *Gesch. d. Byz. Lit.* (2nd ed.). Kucharski, P., *Et. sur la doctrine pythag. de la tétrade* 1952. Kunz, G. F., *The Magic of Jewels* 1915.

Lacaire, P., *Rec. de Trav.* xxvii 1905 no 13, relig. texts. Lacombrade, C., *Synésios de Cyrène* 1951. Lafaye, G., Biblioth. Ec. fr. d'Ath. et de Rome xxxiii 62, *Hist. du culte des Divs. d'Alex.* 1883. Lagarde, P. de. *Ioh. Euch. metrop. quae supersunt*, Abh. d. k. Gesell. d. Wiss. Gött. h.-p. Kl. xxviii 1 1882. Lagercrantz, O. (1) *Alchem. Rezepte d. späten Mittelatt.* 1925 (2) *Pap. gr. Holmiensis* 1913 (3) CMA iv (4) *Das Wort Chemie* (4) *Fest. Lippmann*. Langdon (1) *Sumerian Literature* (2) PBS x no 4 (3) *Bab. Liturgies & Psalms* 1919 (Univ. Pennsylvania, Pubs. Bab. section x 4 332 ff). Laqueur, RE xiv 1 1061. Lassus, J., *Mon. Piot* xxxvi 1938 81–2, 100. Laucher., F., *Gesch. d. Physiologus* 1889. Laufer, B. (1) *Jade* 1912 (2) *Beginnings of Porcelain in China* 1917 (3) *Sino-Iranica* 1919 (Field Mus. Chicago). Lauth, *Phoenixperiode* 1880. Leemans, P. G., *Mus. Ant. Pub. Lugduni Bat.* 1885. Legge, J. (2) *The Religions of China* 1881 (2) *Confucian Analects* (3) *The Texts of Taoism* 1891. Lemay, R., *Abu Ma'shar and Latin Aristotelianism in 12th c.* 1962. Leisegang, H., *La Gnose* 1951. Lejeune, A., *Recherches sur la Catoptrique grecque* 1957. Letronne, *Rec. inscr. gr. et lat. de l'Eg.* Lewin, L. *Phantastica* (transl. Wirth) 1931. Lewy, H. (1) *Sobria Ebrietas* 1929 (2) *Chaldean Oracles and Theurgy* 1956. Lexa, F., *La Magie dans l'Eg. ant.* 1925. Leyel, C. F., *The Magic of Herbs* 1926. Lidzbarski (1) *Das Johanneshuch d. Mandäer* ii 1915 (2) *Quellen d. Religionsgesch*, xiii 1926. Liesegang, H., *Fest. f. F. Poland* (Phil. Woch.) 1932 245 ff, Lietzmann, *Messe u. Herrenmahl* 1926. Lincoln, J. S., *The Dream in Prim. Culture* 1935. Lindsay, J. (1) *Clashing Rocks* 1965 (2) Totemism, *Mél. Delcourt* 1970 (3) *Short History of Culture* (4) *Leisure and Pleasure in Roman Egypt* 1965 (5) *Men and Gods on the Roman Nile* 1967. Lippmann, E. O. von (1) *Enstehung u. Ausbreitung d. Alchemie* 1919 (2) *A.f.G.d. Naturwiss.* 2, 268 (3) *Ambix* ii 1938 21–5 (4) *Chemiker-Zeitung* 1925 no 83 (5) *Ambix* iii 1–14. Lloyd, A. C. in Armstrong (1), later Neoplats. Lloyd, G. E. R. (1) JHS 1968 78–92 (2) *Aristotle: the Growth and Structure of his Thought* 1968. Lobeck, *Aglaophamus* 1829. Loret, V., MIFAO lxvi 2 1935 853–77. Lorimer, *H. L.* in *Greek Poetry and Life* 1936 14 ff. Loring, F. H., *Atomic Theory* 1921. Lucas, A., *Anc. Eg. Materials & Industries* 1948. Ludy, F., *Alchem. u. chem. Zeichen* 1928. Luneau, A., *L'Hist. du Salut chez les Pères de l'Eglise* 1964.

MacCown, *The Testament of Solomon* 1922. MacMullen, *Enemies of the R. Order* 1967. Mahdihassan, J. (1) *Janus* xlix 2–3 1961 79–100 (2) *ib.* li 1 1964 49–61 (3) *J. Bombay Univ.* xx 2 107. Maillon, J. *Heliod. Ethiop.* 1960 i pref. Malinine, R. *d'Eg.* xiv 1962 27–43. Manget, *Biblioth. Chem.* Marquart, *Philol. Suppl.* vi 618 ff. Martin, V. *Rech. de Pap.* ii 1962 37–73. Martin, W. A. P., *The Lore of Cathay* 1901. Maspero, G., *Mem. sur quelques Pap. du Louvre* 1875. Maspero J., *Hist. des Patriarches d'Alex.* 1923. Maspero, H., *J. Asiat.* 1937 177–252, etc. Massignon in F (1) i 384 ff. Matsumara,

J., *Chinese Names of Plants* 1921. Matter, J., *Hist. crit. du Gnosticisme* 1828. Mavromichelis, *Suisse contemp.* 1943 862–70. Mazar, B., ILN 13 April 1963, Arch. sect. 2132. Mead, G. R. S. (1) *Pistis Sophia* 1896 (2) *Thrice-Greatest Hermes* 1906. Meek, T. J., *J. Am. Or. Soc.* lxiii 1943 91. Meissner, B., *Baylonien u. Assyrien* 1925. Mély, F. de (1) *Les Lapidaires de l'Ant. etc.*, 1896 (2) *Les Lap. gr.* 1898. Merlan, P. (1) *Mus. Helvet.* 1951 viii 100 ff (2) in Armstrong (1), Plato to Plotinus. Mesk, J., *Wien. Stud.* xx 309 ff. Messina, P. G. (1) *Orientibus* i 1932 149–76 (2) *Der Ursprung d. Magier* 1930 (3) I *magi a Betlemme* 1933. Mieli, A., *Pagine di Storia della chimica* 1922. Mingana, A., *Woodelrooke Studies* vi 1933. Moberg, A., *Inbjudning till professorsinstall.* Feb. 1930. Momiglinao, A. *Conflict between Paganism and Christianity in 4th c.* 1963. Monceau, P., *La vraie Legénde dorée* 1928. Moret, A. *Ann. Mus. Guimet* xiv 1902 79, 221 (*Le Rituel du culte divin journalier*). Mukand Singh, T., *Treatment of Superstitions* 1893. Mullach. F. G. A., *Democ. Abd. operum frag.* 1843. Muschler, R., *Manual of Flora of Eg,* Murr, *Die Pflanzenwelt in d. gr. Myth.* 1890.

Needham, J. (1) *Science & Civilisation in China* (2) see Ho Ping-Yu (3) with D. J. de Sotta Price, *Heavenly Clockworks* 1960. Nestle, *Die Nach-Sokratiker* 1923. Neuberger, A., *The Tech. Arts and Sciences of the Ancients* 1930. Neugebauer (1) with H. B. van Heusen, *Gr. Horoscopes* 1959 (2) *Vorgriech. Mathematik* 1934 (3) *The Exact Sciences in Antiquity* 1957. Nilsson, M. P. (1) *A.f. Relig.* 1908 xi 530 ff (2) *Bull. Soc. R. Lund.* 1947–8 59 ff. Nock, A. D. (1) *Gnomon* xv 1939 359 (2) JEA 1925 154–7 (3) JHS xlv 1925 90 (4) Excursus in Foakes & Lake, *The Beginnings of Christianity* v 1933 164 ff (5) *Conversion* (6) HTR xxvii 1934 53 (7) REA xxx 1928 280 ff. Norden, *Agnostos Theos.*

O'Brien, D., JHS 1968 93–113. Oder, E., R*h. Mus.* xlv 1930. Oldham, *The Sun and the Serpent* 1905. Ostwald, W., *L'Evolution d'une Science, La Chimie* 1909. Otto, W., *Priester u. Tempel in hellen. Aeg.* 1905.

Palmer, P. M., with R. P. More, *Sources of the Faust Trad.* 1936. Parrot, A., *Le Refrigerium dans l'Ant.* 1937. Partington, J. R. (1) *Origins & Development of Applied Chem.* 1935 (2) *A Hist. of Gr. Fire & Gunpowder* 1960 (3) *Ambix* i May 1937 (4) *Scientia* Oct. 1936. Peek, W., *Der Isishymnus von Andros* 1930. Pépin, J., *Théologie cosmique et Th. chrét.* 1964. Perdrizet (1) *Mél. Maspero* ii 1 137–44 (MIFC 67) (2) *Mon. Piot* 1934 xxxiv 97–128 (3) *Negotium perambulens in deserto* (Pub. Fac. Lettres, Strasbourg 6) 1932 (4) *TCs d'Eg.* (5) *Bronzes Fouquet.* Perry, R. E., RE xx 1106, 13–62. Petersen, E., *Rev. Bibl.* 1948 199 ff. Petrie, W. M. F. (1) *Athribis* (2) *Arts and Crafts of Anc. Eg.* Pettazzoni, R. (1) *I mysteri* 1923 (2) AC xviii 1949 274 ff. Pfeiffer, E., *Stoicheia* ii 1916 93 ff. Pfister, R. (1) *Sem. Kondak.* vii 1935 1–59 (2) RE xi 2116, 2169 f (3) *Tissus Coptes du Mus. du Louvre* (4) *Rev. des arts asiat.* xi 1937 209 f. Pfizmaier, A., *Sitz. d.k. ak. d. Wiss.* 1870 lxv 311. Pohlenz, M., *Die Stoa* 1948. Poirée, E., Ruelle (3) 28 ff. Plessner, M., *Der Islam* xvi 1927 93–5. Plumpe, J. C., *Traditio* i 1943 1–14. Preisendanz, K. (1) *Zur Ueberlieferung. d. spät. Magie* (Zbl. Bibl. Wesen, Beih. 75 1951 223–40) (2) RE *Ostanes* xviii 1631 (3) *Aus. d. Gesch. d. Uroboros* 1940 (4) REG lvi 164. Preisigke, F. (1), *SB gr. Urk. aus Aeg.* 1915. Premerstein, A. von, *Gr.-Heidn. Weise, Fest. d. Nat.-bibl. in Wien* 1926 649 f. Prinz, *Altoriental. Symbolik* 1915. Puech, H. C. (1) *Manichéisme* (2) *Les Nouveaux Ecrits gnostiques* (3) *Mél. Cumont* 935 ff.

Quillard, P., *Jamblique, Les Mystères des Egyptiens* 1941.

Rachewiltz, B. de (1) *Arch. int. di Etnog. e Preist.* i 1958 69–95 (2) *Egitto magico-religioso* 1961. Ramsay, W. M., *Social Basis of* R. *Power in Asia Minor* 1941. Rauschen, *Jahrb. d. chriet. Kirche unter dem k. Theod.* Ray, P. C., *Hist. of Hindu Chemistry.* Read, J. (1) *Prelude to Chemistry* 1936 (2) *The Alchemist in Life, Lit., and Art* 1947. Rehm, A., *Byz. Zeit.* xxxix 1939 394–434. Reinaud, M., *Rels. polit. et commerciales de l'Emp.* R.



*avec l'Asie orient.* 1863. Reinhardt, K., *Hermes* xlv 1912 492–513. Reinhardt, T., *Kosmos u. Sympathie* 1926. Reinking, H. *Die Färberei d. Wolle in Alt.* 1939. Reitzenstein R. (1) *Poimandres* 1904 (2) *Die Göttin Psyche* (Sitz. d. Heid. Ak. 1917 no 10 (3) *Die hellenist. Mysterienrelig.* 1927 (4) *Gnomen* iii 1927 216–82 (5) *Das iran. Erlösungsmysterium* (6) *Nachrichten d.k. Gesell.d.Wiss zu Gott.P-h.Kl.* 1919 1 ff (7) with Shroeder, *Stud. z. ant. Synkretismus* 1926 (8) *Zwei religionsgesch. Fragen* 1901 (9) as (6) (10) *Alchem. Lehrschriften u. Märchen bei den Arabern* (RGVV xix 2) (11) *Fest. Andreas* 1916 39 ff (12) *Das Märchen v. Amor u. Psyche* 1912 (13) *A.f. Relig.* xxbiii 1–2 1930. Reymond, A., *Hist. of the Sciences in GR Ant.* 1927. Riess, E. (1) *Nechepsonis et Petosiridis frag. Magica* 1890, *Philol. Suppl.* 6 1891–3 325–88 (2) RE ii 1816f *astrologie* (3) *ib. Alchemie.* Rickard, T. A. (1) *Man and Metals* 1932 (2) *J. I. Metals* xliii no 1 1930 297. Riddell, W. H., *Antiquity* 1946 xx 113. Rist, J. M., *Eros and Psyche* 1964. Ritter, H., *Vortr. d. Bibl. Warburg* (1921–2) 1923. Robert, L., in *Charisterion eis Anast. K. Orlandon* x65 i 324–47. Rodemer, W., *Die Lebre v.d. Urzeugung bei d.Gr. u. R.* 1923. Rodwell, G. F., *The Birth of Chemistry* 1864. Roeder, *Altaeg. Erzählungen u. Märchen* 1927. Röhr, J., *Der okkulte Kraftbegriff im Alt.* 1923 (Philol. Suppl. xvii). Rose, V., *Hermes* ix 1875 481 ff. Ross, W. D., *Aristotle's Physics* 1936. Roussell, P. (1) R. *de Philol.* 1905 294 (2) *Cultes ég. de Délos* 1916. Ruelle, C. E. (1) R. *de Philol* xxxii 1908 260 (2) REG 00 1888 (3) *Congrès d'hist. de la musique Paris* 1900 15 ff. Rusch, RE 1941 417–22. Ruska, J. (1) *Das Steinbuch des Aristoteles* 1912 (2) *Tabula Smaragdina* 1926 (3) *Quellen u. Stud. z. Gesch. Naturw. u. Med.* 1942 8 305 (4) *Abrab. Alchemisten* 1924 (5) *Quelques problèmes de la litt. alchim.* 1931 (6) with Wiedermann, *Alch. Decknamen* (7) *Archiv f. Gesch. d. Math.* x 1927 112 ff (7a) *Sitz. d. Physik.-med.* lvi–lvlii 1924–5 17 ff (8) as in (3) 1931 179 ff (9) *Isis* xxiv 1936 310 ff (10) *Sal Ammoniac.* (Heidel. Ak. d. Wiss.) 1925 (11) *Das Buch d. Alanna* 1933 (12) *Turba Philosophorum* 1931.

Sacker, *Sibyllin. Texte* 1898. Säflund, G., *Aphrodite Kallipygos* 1963. Sagnard, *Gnose Valentinienne.* Sambursky, S. (1) *Physical World of Late Ant.* 1962 (2) *Physics of the Stoics* 1959 (3) *Physical World of the Greeks* (4) *Archives int. d'Hist. des Sciences* xi 1958 251. Santillana, G. de, *The Origins of Sc. Thought* 1961. Sarton. G., *Intro to the Hist. of Sc.* 1927 on. Sauneron, S., *Les Fêtes d'Esna* 1962. Sax, E., *Philol. Unters.* fasc. 24 1917. Sbordone, F. (1) *Hori Apollinis Hieroglyphica* (2) *Riv. Indo-Greco-Ital.* xix 1935 (3) *Physiologus* 1936. Schaeder, H. H., see R(7). Schaefer, E. H. (early hist. lead pigments & cosmetics in China) *T'oung Pao* xliv 1956 413. Schaefer, J. H., *Die Alchemie* 1887. Schans-Hosius-Kruger, *Gesch. d. röm. Lit.* Schlachter, *Der Globus* 1927. Schamaly, K., *Palästina Jahrb.* xiii 1917 53–99 (heilege Feuer in d. Grabes Kirche). Schmieder, K. C., (1) *Gesch. d. Alchemie* 1832 (2) ed. Strunz 1927. Schmidt, C., *Kopt.-gnost. Schriften in Gr.-christl. Schriftsteller* 13, 1905. Schoff, W. F., *J. Am. Or. Soc.* 1915 xxxv. Schubert, P., *Die Eschatologie d. Posidonius* 1927. Schürer, *Gesch. d. jüd. Volkes.* Schuster, M., *Comment. Vindobon.* 2 1936 55–70. Schwartzlose, F. W., *Die Waffen d. alt. Araber.* Schweinfurth, *BI Eg.* 1887 2nd s. 8. Scott, W., *Hermetica.* Segal, *Sabian Mysteries.* Sethe (1) *Imhotep* (2) *Amun* 1929. Shelvon-Williams, I. P., in Armstrong, pt. vi. Sheppard, H. J., *Ambix* x 1962 82–97. Shorey, P., *Am. J. Philol.* ix 298. Simpson, JEA lii 1966 39–52. Singer, C. (1) herbals JHS xlvii (2) wirh Sigerist, *Essays on the Hist. of Medicine* 1924 (3) *Studies in the Hist. and Method of Science* (4) with Holymard and Hall, *Hist. of Technology.* Sjoberg, E., *Der Menschensohn im Aethiop. Henochbuch* 1946. Skeat. T. C., with Turner, JEA liv 1968 199–208. Skemp, J. B., *The Theory of Motion in Plato's late dialogues.* Smith, W. B., *Ecce Deus* 1912. Solmsen, F., *Aristotle's System of the Physical World* 1960. Spanneut, M., *Le stoicisme des Pères de l'Eglise* 1957. Stamford, W. B. (1) *The Sound of Greek* 1967 (2) *Hermathena* xcviii 1964. Stange, A., *Das Zeitalter d. Chemie in wort u. Bild.* 1908. Stapleton, H. E. (1) *Arch. Inst. Hist. des Sc.* 1953 no 22 44–59 (2) *Mem. Asiat. Soc. Bengal* xii 1 1933 (3) *Ambix.* vi 1–9 (4) *ib.* v 1953 1–43 (5) iii 69–90 (6) MASB i 1905 25–42 (7) as (2) 134–41 (8) *ib.* viii no 61 1927 346. Steele, R. (with Singer)

*Procs. R. Soc. Medicine* 1928 xxi 41–57. Steier, RE *Mohn.* Stella, L., *Rend. Ac. Lincei* 1927 277 ff. Stephanides, M. (1) REG 1922 296 (2) *ib.* 1923 189 (3) *L'art psammurg. et la Chine* 1909 (4) *Archiv f.d. Gesch. Naturw.* iii 180 1912 (5) *Scientia*, March 1922 xxxi (6) *Symbolai eis ten histor. ton physikon Epistemon* 1914. Stillman, J. M., *Story of Alch. and Early Chem.* 1924. Stratton, G. M., *Theophrastus and. the Gr. Physiol. Psychology before Aristotle* 1917. Stricker, B. H., *De Geboorte von Horus* 1963. Strong, A., *Apotheosis and After Life* 1915. Szabadvary, F., *Hist. of Analytical Chemistry.*

Tannery, P. (1) REG 1890 282 (2) *Mém. scientif.* ix 147 ff (3) *Pour l'Hist. de la Science hell.* 1887 (4) *Sciences exactes dand l'Ant.* 1912. Tarn, JHS xlviii 1928 218. Taylor, F. S. (1) *The Alchemists* 1951 (2) JHS 1 1930 109–39 (3) *Ambix* i 1937 64–7 (4) *ib.* 88–92 (5) *ib*, ii 6–39 and ii 1938 39–49 (6) *ib.* i 30–47. Taylor, T. (1) *Two Treatises of Proclus* 1853 (2) *Select Works of Plotinus*, ed. Mead 1829. Thomson, G. (1) *The First Philosophers* 1955 (2) *The Prehistoric Aegean* 1954. Thompson, D. W., *Glossary of Gr. Birds* 1936. Thompson, E., *A R. Reformer and Inventor* 1952. Thompson R. C. (1) *On the Chemistry of the Anc. Assyrians* 1925 (2) *Dict. of Assyr. Chem. and Geology* 1936 (3) *Dict. of Assyr. Botany* 1949 (4) with Gadd, *Iraq* iii 1936 87 ff. Thompson, T., *Hist. of Chemistry* 1830. Thorndyke, Lynn (1) *Hist. of Magic and Experim. Sc.* 193 1923 on (2) in Singer (2). Titley, A. F. *Ambix* i 1937 67–9. Tran Tam Tinh, V., *Le Culte d'Isis à Pompeii* 1964. Tümpel, RE i 1752. Turner, E. G., see Skeat (1).

Vermaseren, M. S., *Mithras the Secret God* 1963. Völker, *Mysterium u. Agape* 1927. Volten (1) *Demot. Traumdeutung* (2) *Das demot. Weisheitsbuch.*

Waddell, W. G., Loeb *Manetho* 1940. Waerden, B. L. v.d., (1) JNES viii 1949 6 (2) *Die Anfänge. d. Astronomie* 1965. Waite, A. E. (1) *Turba Philos.* 1914 (2) *The Hermetic Museum* 1893. Waley, A., *Bull. School Or. Stud.* vi 1 1930. Waser, O. (1) *A. f.Relig.* xvi 382 ff (2) Roscher iii 3234 ff. Wasserstein, A., *Hist. of Sc.* iii 1964. Weber, W., *Die aeg.-gr. Terrakotten* i 1914. Weidlich, T., *Die Sympathie in d. ant. Lit.* 1894. Weller, H., *Anahita* 1938. Wellmann, M. (1) *Die Physika d. Bolos Demok.* etc. (Abh. preuss. Ak. d. Wiss. Ph.-H. Kl. no 7) 1928 (2) Ed. *Dioskorides, de MM* 1906–14 (3) *Der Physiologus* (Philol. Suppl. Bd. xxii, 1) 1930 (4) *Marcellus von Side . . . Koiraniden d. HT.* (PS Bd. xxvii 2) 1934 (5) *Hermes* xxxv 367 (6) *ib.* xxxiii 360 ff (7) *ib.* li 1916 57 ff (8) *Stud. f. Gesch. u. Naturw.* iv 4 (9) as in (1) fasc. 4 1921, Georgika d.D., (10) in Diels (5). Wellesc, E., *Ambix* iv 1951 145–58. Winsinck, A. J., *New Data concerning Syriac Mystic Lit.* 1923. Werber, E. T. C., *Myths & Legends of China* 1922. Wessely (1) *Wien. Stud.* viii 176 ff (2) *ib.* xx 140 (3) BIFAO xxx 1931 17 ff. Wetter, G. F., *Phos* 1915. Wheeler, R. E. M. (1) *Anc. India* 1946 no 2 17 (2) *Rome Beyond the Imp. Frontier* 1954. Wheelwright, P., *Heraclitus* 1959. Whittaker, T. (1) *Macrobius* 1923 (2) *The Neo-Platonists.* Widengren, G. (1) *Religionens värld.* 1945 (2) *Mesopot. Elements* etc. Wiedermann, E. (1) *Enc. Islam* 1927 ii 1010 (2) *Herodots zweites. Buch* Wikenhauser, *Röm. Quart.* xlv 1937 1 ff. Wilson, W. J. (1) *Ciba Symposia* iii 1941 916–60 (2) *Bull. Hist. Med.* xxv 1951 307 Windisch (1) *Theol. Tijdschrift* 1918 (2) *Die Orakel des Hyspastes* 1929. Würbelauer, K. W., *Antike Lapidarien* 1937. Wolff, *Porphyrii de Phil. ex Orac. haur.* 1856. Wünsch, R. AfR xiv 1911 319 ff.

Yetts, P., *J. R. Asiat. S.* 1916 xlviii 773–807.

Zacharias, P. D. (1) *Ambix* iii 116–28 (2) *X Intern. Cong. Chemistry* 15–21 May 1938, i 61–7. Zaehner, R. C. (1) *The Dawn and Twilight of Zoroastrianism* 1961 (2) *At Sundry Times* 1958. Zahn, H. with D. Gillis, *J. Chem. Educ.* xxxiii 1946 90–7, 128–34. Zielinski, T., AfR viii 1905 321 ff; xi 1906 25 ff. Zoega, G. de, *Cat. Cod. Copt* Zuretti, C. O., CMAG viii 1922 (signs).

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