

On Stones

Theophrastus

A



OF Things formed in the Ground, some have their Origin from Water, others from Earth.

Water is the Basis of Metals; as Silver, Gold, and the rest: Earth of Stones; as well the more precious, as the common: and of the various Earths of peculiar Kinds, whether remarkable for Colour, Smoothness, Density, or whatever other Quality.

The Metals have been considered in another Work: the Stones and Earths of various Kinds, therefore, are to be the Subject of this Treatise.

All these we are (plainly speaking) to judge formed by the Concretion of Matter pure and equal in its constituent Parts; which has been brought together in that State by mere Afflux; or by means of some Kind of Percolation; or separated, as before observed, from the impurer Matter it was once among, in some other Manner: For perhaps it is effected in some Cases by one; and in others by other of these Means.

From the Differences of the constituent Matter; and of the Manner of its Coalescence, the Concrete assumes its various Qualities, as Smoothness, Density, Brightness, Transparency, and the like; and according as it is more pure and equal, the more does it partake of these.

On the whole, the more perfectly the Concretion has been formed, and the more equal in its constituent Parts the concreting Matter was, the more does the Concrete possess the peculiar Properties which are owing to that Equality.

The Concretion is, in some of these Substances, owing to Heat; and in others to Cold. There is perhaps nothing to hinder but that the Coalescence of some Kinds of Stones may be occasioned by the one, and of others by the other of these Causes: though that of the Earths of all Kinds seems owing only to Heat. From these contrary Causes, however, may happen the Concretion, or dissipation of contrary Substances.

There are in Stones of different Kinds many peculiar Qualities, which arise from this, that there are many very great Differences both in the Matter and Manner of the Affluxes of the terrestrial Particles from which they were formed; of which those in regard to Colour, Tenacity, Smoothness, Density, and the like Accidents, are frequent; though those in other more remarkable Properties, are not so common.

These Qualities Stones have, therefore, from the common Differences of the Matter, and Manner of the Affluxes of their constituent Parts: But besides these, they have others which arise from the more peculiar Powers of their concreted Masses: Such are their acting upon other Bodies; or being subject, or not subject to be acted upon by them. Thus some are fusible, others will never liquify in the Fire; some may be calcined, others are incombustible; and in others, other such particular Properties are observable. To this it may be added, that in the Action of the Fire on them, they also shew many Differences.

Some are said to have a Power of making Water appear of their own Colour, as the Emerald. Others of petrifying, or converting wholly into Stone, whatever is put into Vessels made of them. Others have an attractive Quality; and others serve for the Trial of Metals, as that called the Lydian Stone.

The greatest, however, and most wonderful of all the Qualities of Stones is that (if the Accounts of it are true) of those which bring forth young.

But the most known and general Properties of Stones are their several Fitnesses for the various Kinds of Work. Some of them are proper for engraving on; others may be shaped by the Turner's Tools; others may be cut or sawed: Some also there are which no Iron Instruments will touch; and others which are very difficultly, or scarce at all to be cut by them XIII. There are also, besides there, many other Differences observable in them, according to their several Qualities; of which those in regard to Colour, Hardness, Softness, Smoothness, and the like Accidents, because of the Number and Diversity of those Qualities, happen to many.

And to some indeed through whole Countries; from which Quarries of them have obtained their Names; as the — Parian, the Pentelican, the Chian, and the Theban.

In Ægypt, about, there is also found the Alabaster, which is dug in large Masses; and the Chernites, which resembles Ivory, and in which, it is said, Darius was buried; as also the — Porus, which in Colour and Hardness emulates the Parian Marble, though singular in its remarkable Lightness: in this it resembles the Tophus: and on Account of this the Ægyptians generally used it in the Partitions of their more elegant Edifices.

There is also found in the same. Place a transparent, something like the Chian: and in others, there are many other Kinds.

These are the Differences which have been mentioned as common to many Stones. But those which arise from the particular Powers before named, are less frequent; nor do they like these, happen to whole Strata, or vast Masses. Some of the Stones, in which they take Place, are very scarce and small, as the — Emerald, the Carnelian, the Carbuncle, the and, in general, all that are cut as Gems: and some of them are found in dividing other Stones.

Some few of these Stones there are, which are subject to the Force of Fire, and may be burnt. These shall be first treated of, in Consideration of what their Differences are.

In regard to the Action of Fire on them, some are fusible, and melt by it; as the metalline Kinds. For the Stones, which partake of the Nature of Metals, as Silver, or Iron,” melt in the Furnaces with them; either by means of the Humidity of the metalline Matter of which they partake; or of their own Nature: and in this Manner the Pyritoe also, and those Kinds of them called the Molares, melt with the Matter they are laid upon in burning.

Some absolutely affirm, that all Stones will melt in the Fire except — which by burning is reduced to Lime: But this is faying absolutely, and of all, what ought only to be said in general, and of the greater Number.

For some burst and fly in Pieces in the Fire: as, though not fusible, yet not of Power wholly to refill the Force of the Heat; which is also the Cafe in earthen Vessels. This is an Effect no way repugnant to Reason; for these are absolutely dry, whereas whatever is fusible must be, at least in some Degree, moist; and retain, to the Time of its Fusion, more or less of its Humidity.

It is said also, that on exposing to the Sun’s Rays some are wholly dried up; so as to be rendered useless, unless macerated and impregnated again with Moisture: while others by the lame means become softer and more brittle. It is evident that the Humidity is extracted in both these Cafes; the Difference is, that the more dense and compact Stones harden by this drying; whereas the looser, and those of a less firm Texture, become more brittle and soft by it.

Some of the more brittle Stones there also are, which become as it were burning Coals, when put into a Fire, and continue so a long time: of this Kind are those about Bena, found in Mines, and washed down by the Torrents, for

they will take fire on throwing burning Coals on them, and continue burning so long as any one blows them; afterwards they will deaden, and may after that be made to burn again: they are therefore of long Continuance, but their Smell is troublesome and disagreeable XXIV. That also which is called the Spinus, is found in Mines. This Stone cut in Pieces and thrown together in a Heap, exposed to the Sun, burns: and that the more, if it be moistened or sprinkled with Water.

But the Lipara Stone empties itself as it were in burning; and becomes like the Pumice: changing at once both its Colour and Density; for before burning it is black, smooth, and compact. This Stone is found in the Pumices, separately, in different Places, and as it were in Cells, no where continuous with the Matter of them. It is said, that in Melos the Pumice is produced in this Manner in some other Stone, as this is on the contrary in it. But the Stone in which the Pumice is found, is not at all like the Stone, which is found in it.

Certain Stones there are about Tétras in Sicily, which is over against Lipara, which empty themselves in the same Manner in the Fire.

And in the Promontory called Erineas, there is a great Quantity of Stone like that found about Bena; which, when burnt, emits a bituminous Smell, and leaves a Matter resembling calcined Earth.

Those fossile Substances that are called Coals, and are broken Use, are earthy, they kindle however, and burn like wood Coals. These are found in Liguria, where there also is Amber, and in Elis, in the Way to Olympias over the Mountains. These are used by the Smiths XXIX. There is also found in the Mines of Scaptesyloe a Stone, in its external Appearance something resembling rotten Wood; on which, if Oil be poured, it burns; but when the Oil is burnt away, the burning of the Stone ceases, as if it were in itself not liable to such Accidents.

These then are the Differences of the Stones which are subject to the Force of Fire.

But there is another Kind of Stone, formed, as it were, of contrary Principles, and entirely incombustible: This is called the Carbuncle, on which they engrave Seals. Its colour is red, and of such a Kind, that when held against the Sun, it resembles that of a burning Coal. This Stone is extremely valuable, one of a very small Size being valued at forty Aurei. It is brought from

Carthage and XXXII. There is also an incombustible Stone found about Miletum, which is of an angular Shape, and sometimes regularly hexangular; they call this also a Carbuncle from its not being injured by the Fire; but that is strange, for the Diamond might as properly be for that Reason called by the same Name, as it also possesses that Quality.

The Power these Stones have of refilling the Force of Fire; is not from the same Cause with that of the Pumices, or of Ashes. They seem not to burn, because they absolutely and originally contain no Moisture; whereas those Substances do not kindle nor burn in the Fire, because their Humidity has been already evaporated.

Some are of opinion, that the Pumices have been entirely made what they are by burning; that Kind excepted which they esteem formed by the Concretion of the Froth of the Sea: This Opinion, as to the Sea kind, they take from the apparent Testimony of their Senses.

As also the other, in regard to those formed in the Mouths, and different Openings of the burning Mountains, through which the Flames have made their way: and those made by burning the Lapis Arabicus, a Stone, which when it has passed the Fire assumes the Form of the Pumice. The places, indeed, in which Pumices are produced, seem to testify the Manner of their Formation; for they are principally found about the Craters of the burning Mountains. On the whole some Kinds of them, perhaps, may be formed by the Action of Fire on Stones of a proper Texture, and others in some other Manner: for there are in Nature many different Ways of Production..

The Pumices in the Island of Nisuros seem an Instance of this, for they appear to have been formed by a flight Coalescence only of an arenaceous Matter: What is esteemed a Proof of this is, that some of the Pumices found there crumble in the handling into a kind of Sand, as if they never had been thoroughly concreted or bound into a Mass.

These are found in Heaps, many of them at least as big as can be grasped in a Man's Hand, and sometimes larger than that, when the superficial Part is taken off.

All the Pumices of the island of Melos are also light and sandy; and some Kinds there are which are produced, as was before observed, in other Stones.

The different Sorts also vary from one another in Colour, Compactness, and Gravity.

As to their Colour, there is a black Kind found on the Sicilian Shores, which is compact and weighty, and something resembles that kind of the Pyrites called the Molaris: for there is a natural Pumice of this Texture, heavy and compact; and this is of more Value and more useful than many of the others; this Kind from the Shores is a better Abstergent than the light white Kind: But the moil abstergent of all others, is that from the Sea itself.

Hitherto has the Pumice been treated of: Hereafter are to be considered the Natures and Causes of the Diversity of the other several Kinds of combustible and incombustible Stones; from the History of which this Digression has been made.

There are, beside what has been already named, among the Stones which are cut as Gems, other Differences, in regard to their several peculiar Qualities.

Some of which are in the external Appearance only. Of this Kind are those of the Carnelian, the Jasper, and the Sapphire; which last is spotted, as it were with Gold.

The Emerald has also its peculiar Properties; for it assimilates Water, as was before observed, to its own Colour. A Stone of a middling Size will do this to a small Quantity only of the Water into which it is put, a large one to the Whole; but a bad one to no more than a little of it, which lies just about it. It is also good for the Eyes; for which Reason People carry about them Seals engraved on it, that they may have them to look on. It is, however, a scarce Stone; and but small: unless we are to give Credit to the Commentaries of the Egyptian Kings, in which it is recorded, that there was once sent as a Present from a King of Babylon an Emerald four Cubits in length, and three in breadth: And that there was in their Temple of an Obelisk composed of four Emeralds, which was forty Cubits long, and in some Places four, and in others two Cubits wide. These Accounts we have from their Writings, XLV. But of those which are commonly called the Tani, the largest any where known is in Tyrs; for there is at that Place a very large Pillar of this Stone in the Temple of Hercules. But perhaps this is no true Emerald, but of the Pseudo-Smaragdus, or bastard Kind; for there is such a Stone of this Class.

The common bastard Emeralds are produced in Places known and well frequented; especially in two; the Copper Mines of Cyprus, and an Island over against Carthage. In this Island the true Emerald is also sometimes found. These are dug out of the Earth as the other; and in Cyprus there are many Veins of them together; few, however, are found there big enough for Seals to be engraved on: the small ones are very numerous, insomuch that they use them for soldering of Gold; which Purpose they serve in the manner of Chrysocolla. Some have imagined them, indeed, to be of the Chrysocolla Kind, and in Colour they certainly are very like.

The Chrysocolla is found in great Quantity in Gold Mines; and even much more plentifully in those of Copper, and the Places near them.

The true Emerald is, as before observed, a scarce Stone; it seems to be produced from the Jasper, for it is said there has been found in Cyprus a Stone, the one half of which was Emerald and the other Jasper, as not yet changed.

There is some Workmanship required to bring the Emerald to its Lustre, for originally it is not so bright.

It is, however, excellent in its Virtues, as is also the Lapis Lyncurius, which is likewise used for engraving Seals on, and is of a very solid Texture, as Stones are; it has also an attractive Power, like that of Amber, and is said to attract not only Straws and small pieces of Sticks, but even Copper and Iron, if they are beaten into thin Pieces. This Diodes affirms.

The Lapis Lyncurius is pellucid, and of a fire Colour: And those Stones which are produced from the Animal in its native Wildness, are better than those from the tame; as also those from the Male, than those from the Female: As the different nourishment the Creature eats, and the different Exercise it uses, as well as the Difference of its whole Habit of Body, in being either dryer or moister, make great Differences in the Stones.

They are found in digging, by People who are skilful; though the Creature, when it has voided its Urine, hides it, and heaps the Earth together about it. The polishing these Stones is also a Work of great Trouble.

Amber also is a Stone: It is dug out of the Earth in Liguria, and has, as the before mentioned, a Power or Attraction: But the greatest and most evident attractive Quality is in that Stone which attracts Iron. But that is a scarce

stone, and found in but few Places: It ought, however, to be ranked with these Stones, as it possesses a like Quality.

There are, beside these, many other Gems used for the engraving Seals: As the Hyaloides, which reflects the Images of Things, and is pellucid; the Carbuncle, and the Omphax; as also Crystal, and the Amethyst; both which are, in like manner, pellucid.

These, as also the Carnelian, are sometimes found in the dividing other Stones.

Other Differences there also are, as was before observed, in Gems of the same Name: As in Carnelians, that Species which is pellucid and of a brighter red, is called the Female; and that which is pellucid and of a deeper red, with some Tendency to Blackness, the Male. The Lapis Lyncurius is distinguished in like manner, the Female of which is more transparent, and of a paler yellow; and the Lapis — is in the same manner divided into Male and Female; the Male is in this also of the deeper Colour.

There is also the Onyx, variegated with white and brown placed alternately; and the Amethyst, which resembles Red-wine in Colour.

The Agate also is an elegant Stone; it has its Name from the River Achate in Sicily; and is sold at a great Price.

There was also once found in the Gold Mines of Lampsacus an admirably beautiful Gem, on which, after it had been lent to Uyre, a Seal was engraved, which for its Excellence was presented to the King.

These are very beautiful, and very scarce: But those produced in Greece, are of the meanest and worst Kind.

Such are also the Carbuncles of Orchotnenus in Arcadia, which are darker coloured than the Chian; but are, however, used for making Mirrors; and the Trazenian, which are varied gated with purple and white: The Corinthian is also of this Kind; it is variegated with the same Colours, but is whiter and paler. And finally, there are many others of this Sort.

But the most perfect and valuable Carbuncles are scarce, and had only from a few Places as Carthage and Massilia from Ægypt, about the Cataracts of the Neighbourhood of Syene, a City of the Elephantines, and from the Country called Psebos.

In Cyprus also are found the Emerald and the Jasper but what are used for letting in Cups and other Vessels of Gold, they have from Bactriana, toward the Desart: They go thither on Horseback to search for them, at the Time of the blowing of the Etesian or annual Easterly Winds; for they are seen at that Time, as the Sands are violently tossed about by the Winds: What they find there, however, are but small.

Of the Number of the Precious Stones is that also which is called the Pearl. It is not of a pellucid Nature, but Bracelets, and other Ornaments of great Value are made of it. It is produced in a kind of Oyster, and, in like manner, in the *Pinna marina*; and is found in the Indies, and on the Shores of certain Islands in the Red Sea.

These are of peculiar Excellence and Value. And there are yet also some others to be mentioned; as the fossile Ivory, which is variegated with Digitized by white and a dark Colour and the Sapphire, which is of a dark Dye, and not very different from the Male Cyanus; as also the Prasius, which is of an æruginous Colour.

And the Hæmatites, or Bloodstone, which is of a dense, solid Texture, dry, or, according to its Nam seeming as if form'd of concreted Blood: There is also another Kind of it, called Xanthus, which is not of the Colour of the former, but of a yellowish White, which Colour the Dorians call Xanthus.

To these may be added Coral, for its Substance is like that of Stones: Its Colour is red, and its Shape cylindrical, in some fort resembling a Root. It grows in the Sea.

The” petrified Calamus Inflicus alfo, is not very different from this. But these are more properly the Subjects of a different let of Observations. LXIX. Beside these there are also many Kinds of metalline Stones, some of which contain both Gold and Silver, though the Silver alone is visible; and these are very remarkable, both for their Weight and Smell.

As also the native Blue, or pis Armenus which has in it Chrysocolla; and another Stone, in Colour resembling the Carbuncle, but much heavier.

Upon the whole, there are many and very remarkable, different Kinds of fossile Substances dug in Pits; some of which consist of an argillaceous Matter, as Ochre, and Reddle; others of a sandy, as Chryfocolla and the Lapis Armenus; and others as it were of Ashes, as Sandarach, Orpiment and others

of that Kind.

Many other Properties there also are in these Substances which are easily observed. As that some of the Stones before named are of so firm a Texture, that they are not subject to Injuries, and are not to be cut by Instruments of Iron, but only by other Stones.

On the whole, there is a great Difference in the Texture of the larger Stones; as may be learnt from the different Manners in which they may be worked; some may be cut, others engraved on, and shaped, as before observed, by the Turner's Instruments, as the Magnet Gem, a Stone of very elegant Appearance, and much admired by many This carries a fine Resemblance of Silver, though it is in Reality a Stone of an entirely different Kind.

Many also there are, which admit all Kinds of working; as in Siphnus there is a fossile Substance of this Kind, which is dug in Lumps, and roundish Masses, at about three Furlongs Distance from the Sea: This may at first be either engraved on, or: worked by the Turner into any Form, by reason of its Softness; but when it is afterwards burnt and wetted with Oil, it becomes black and solid. Vessels of different Kinds, for the Service of the Table, are made of this.

All Substances of this Kind are to be worked on by Iron Instruments; but others there are, which, as before observed, will not be touched by them, but must be cut by other Stones; and others yet, which may be cut with Iron, but the Instruments must be dull and blunt: Which is much as if they were not cut by Iron.

Iron, however, being harder in its Texture than Stone, will cut such as are both harder and more solid than these.

There seems, however, yet an Absurdity in this, since the Whetstone has Power upon, and takes off a Part of the Iron Instruments which are sharpened on it, and the Instrument may be made to cut and work upon the Whetstone; but notwithstanding, will not cut those Gems which are work'd into Seals; tho' the Stone with which they are worked is composed of the same Kind of Matter with the Whetstone, or something not very unlike it. These Stones are from Armenia. LXXVIII. The Nature of the Stone which tries Gold, is also very wonderful, as it seems to have the same Power with Fire; which is also a Test of that Metal. Some People have, for this Reason, questioned the Truth

of this Power in the Stone; but their Doubts are ill founded, for this Trial is not of the same Nature, or made in the same Manner with the other. The Trial by Fire is by the Colour, and Quantity lost, by it; but that by the Stone, is made only by rubbing the Metal on it; the Stone seeming to have a Power of receiving separately the distinct Particles of different Metals.

It is said also, that there is a much better Kind of this Stone now found out, than that which was formerly used; insomuch, that it now serves not only for the Trial of the refined Gold, but also of Copper or Silver coloured with Gold; and shews how much of the adulterating Matter by Weight is mixed with Gold: This has Signs which it yields from the smallest Weight of the adulterating Matter, which is a Grain, from thence a Colybus, and thence a Quadrans or Semi-Obolus; by which it is easy to distinguish if, and in what Degree, that Metal is adulterated.

All these Stones are found in the River Tmolus; their Texture is smooth, and like that of Pebbles; their Figure broad, not round; and their Bigness twice that of the common larger Sort of Pebbles. In their use in the Trial of Metals, there is a Difference in Power between their upper Surface, which has lain toward the Sun, and their under, which has been to the Earth, the upper performing its Office the more nicely; and this is consonant to Reason, as the upper Part is the dryer; for the Humidity of the other Surface hinders its receiving so well the Particles of the Metals: For the lame. Reason also it does not perform its Office so well in hot Weather as in colder, for in the hot it emits Kind of Humidity out of its Substance, which runs all over it: This hinders the metalline Particles from adhering perfectly, and makes Mistakes in the Trials. This Exsudation of a humid Matter is also common to many other Stones; among others, to those of which Statues are made; and this has been looked on as peculiar to the Statue.

These then, in general, are the Differences, and particular Qualities of Stones.

Those of Earths are fewer, indeed, but they are also more peculiar.

'Earth is subject to be liquated, altered from its original State and Consistence, and afterwards indurated again. It will melt, as Stones, with fusible and fossile Substances; and is softened, and made into Bricks: These are of various Kinds, and composed in various Manners, but are all made by

moistening and burning.

But if Glass be made, as some affirm, of the, a vitrifiable Sand, it owes its Production to the extreme Force of Fire: The best is that, in the making of which Flints have also been used; for besides that they melt and mix with the running Mass, they have a peculiar Excellence in the making the Glass, insomuch that they give the Differences in the Clearness of the Colour; LXXXV. There is in Cilicia a kind of Earth, which by boiling becomes tough and viscous; with which they cover the Vines instead of Birdlime, to preserve them from the Worms.

It may also be proper to mention here the Earths which are naturally endued with a Quality of petrifying Substances immersed in them; since those which yield peculiar and different Juices, have unquestionably some fixed and peculiar Properties, and are distinct Kinds; as are also those which supply Nourishment to Plants. LXXXVII, Nor ought those to be less considered which are singular and remarkable in their Colours, and for that Reason used by Painters.

The Production of these, as was observed in the Beginning of this Treatise, is from the mere Afflux or Percolation of their constituent Particles.

Some of these seem burnt, and to have suffered Changes by means of Fire, as Sandarach, Orpiment, and others of that Kind; all of them, however, plainly speaking, owe their present Form to the Exhalation of their more humid Parts; and these, in particular seem to have been dried, and, as it were, smoaked. They are found in Mines of Gold and Silver, and some in those of Copper also.

Of this kind are Orpiment, Sandarach, Chrysocolla, Reddle, Ochre, and the Lapis Armenus; but this last is scarce, and found only in small Quantities; whereas there are sometimes whole Veins of the others. Ochre is laid to be found generally heaped together; and Reddle scattered, as it were, every way. Painters use this Reddle in their Pictures, as also Ochre, instead of Orpiment; for when powdered they scarce at all differ in Colour, however different they appear in the Mass.

There are also in some Places peculiar Pits of Reddle and Ochre, as in — Cappadocia, from whence they are taken in vast Quantities: But in these Pits, it is said, the Labourers are in Danger of Suffocation; which unhappy

Accident sometimes comes on very suddenly.

The best Reddle, for there are many Kinds, is thought to be that of Cea, and particularly that which is taken from the Reddle Pits; or it is also sometimes found in Iron Mines.

There are beside these also, the Lemnian Reddle, and the — as it is commonly called; but it is dug in — Cappadocia, and thence carried to Sinope. There are particular Pits in Lemnos, in which nothing but the Earth is dug.

There are three kinds of the Sinopic; of a deep Red, another of a whitish Colour, and the other of a middle Colour between the other two, which is called the pure simple Kind, because it is used without mixing, whereas they mix the others.

There is also a kind of this made of Ochre, by burning, but it is not nearly so good as the others. The making this was an Invention of who took the Hint of it, as is laid, from observing, in a House which was on fire, that some Ochre which was there, when half burnt, assumed a red Colour.

The way of making the factitious is this: They put the Ochre into new earthen Vessels, which they cover with Clay and set in Furnaces; and these, as they grow hot, heat also the Ochre, and the greater Degree of Fire they give, the deeper and more strongly purple the Matter becomes. The Origin of the native Kinds seems to testify that this Method is not irrational, for all these seem to have suffered Changes by the Action of Fire: From whence we may rationally conclude, that this way of making the factitious, is either of the same kind, or at least very analogous to that used by Nature for the Production of the genuine.

The Reddle also is of two Kinds, the native, and the factitious XCVIII. There is also, beside the native Lapis Armenus, a factitious Kind made in Egypt, There are, indeed, three different Sorts of this; the Egyptian, the Scythian, and the Cyprian; of which the Egyptian is the best for clear strong Paintings, and the Scythian for the fainter. The Egyptian is factitious; and the Historians, who write the Annals of the Kings of that Nation, think it a thing worthy a Place in their Histories, which King of Egypt was the Inventor of the artificialleum in Imitation of the native.

Presents are also made to great Perlons, in some Places, of this Substance, as well that which has passed the Fire as that which has not; and the Phoenicians pay their Tribute in it.

People who prepare Colours say also, that the Lapis Armenus of itself makes four different ones; the two extremes of which are, first, that which consists only of its finest Particles, and is very pale; and the other, that which consists of its largest, and is extremely deep.

But these are the Works of Art, as is also Cerufe, to make which, Lead is placed in earthen Vessels over sharp Vinegar, and after it has acquired some Thickness of a kind of Run, which it commonly sees in about ten Days, they open the Vessels, and scrape it off, as it were, in a kind of Foulnefs; they then place the Lead over the Vinegar again, repeating over and over the same Method of scraping it, till it is wholly dissolved; what has been scraped off they then beat to Powder, and boil for a long Time; and what at last subsides to the Bottom of the Vessel is the Ceruse.

In a Manner also, something resembling this, is Verdigrise made; for Copper is placed over the Lees of Wine, and the Rust which it acquires by this means is taken off for Use: And it is by this means that the Rust which appears is produced CIII. There are also two kinds of Cinnabar, the one native, the other factitious; the native, which is found in Spain, is hard and stony; as is also that brought from Colchis, which they say is produced there in Rocks and on Precipices, from which they get it down with Darts and Arrows. The factitious is from the Country a little above Ephesus; it is but in small Quantities, and is had only from one Place. It is only a Sand, shining like Scarlet, which they collect; and rub to a very fine Powder, in Vessels of Stone only; and afterwards wash in other Vessels of Brass, or sometimes of Wood: What subsides they go to work on again, rubbing it and washing it as before. And in this Work there is much Art to be used; for from an equal Quantity of the Sand some will make a large Quantity of the Powder, and others very little, or none at all. The Washing they use is very light and superficial, and they wet it every time separately and carefully. That which at last subsides is the Cinnabar, and that which swims above in much larger Quantity is only the superfluous Matter of the Washing.

It is said, that one Callias, an Athenian, who belonged to the Silver Mines, invented and taught; the making this artificial Cinnabar. He had carefully got together a great Quantity of this Sand, imagining, from its shining Appearance, that it contained Gold: But when he had found that it did not, and had had an Opportunity, in his Trials, of admiring the Beauty of its Colour, he invented and brought into use this Preparation of it. And this is no old Thing, the Invention being only of about ninety Years Date; lus being at this Time in the Government of Athens.

From these Accounts it is manifest, that Art imitates Nature, and sometimes produces very peculiar Things; some of which are for Use, others for Amusement only, as those employed in the ornamenting Edifices; and others, both for Amusement and Use. Such is the Production of Quicksilver, which has its Uses: This is obtained from native Cinnabar, rubbed with Vinegar in a brais Mortar with a brass Pestle. And many other Things of this kind others, perhaps, may hit upon.

There yet remain also of the fossile Kingdom certain remarkable, Earths dug out of Pits, the Formation of which, as was observed in the beginning of this Treatise (owing either to the mere Afflux or Percolation of their constituent Parts) is from a more pure and equal Matter than the other more common Kinds. And these receive their various Colours from the Differences as well of their Properties of acting on other Bodies, as of their being subject to be acted on by them. Some of these they soften, and others melt, and afterwards reduce to Powder; and from these compose the stony Masses which we receive from Asia.

But the native, which have their Use as well as Excellence, are only three or four; the Melian, the Digitized by Cimolian, the Samian, and the tymphaican, çalled Gypfum.

Of these the Painters use only the Melian; they meddle not with the Samian, though it is very beautiful, because it is fat, dense, and uncuous; whereas such as are of a looser Texture, crumbling, dry, and without Fatness, are fitter for their Use; all which Properties the Melian particularly that of Pharis, possesses. There are, however, beside these, in Melos and Samos both, many various kinds of Earths.

The Diggers in the Pits of Samos cannot stand upright at their Work, but are forced to lie along, either on their Backs or on one Side; for the Vein of the Earth they dig runs lengthway, and is only of the Depth of about two Foot, though much more in Breadth, and is inclosed in on every Side with Stones, from between which it is taken. There is also in the Mass of the Vein a distinct Stratum near the Middle, which is of better Earth than that without it; and within that there is sometimes another yet finer; and even beyond that a fourth: The farthest of these is that which is called the After, CX. Earths of some kinds are also used about Cloaths, particularly the molian. The Tymphaica is also used for the same Purposes; and the People of Tymphaa and the neighbouring Places call it Gypfum.

Gypsum is produced in great Quantities in the Island of Cyprus, where it lies open, and easy to be discovered, and come at, the Workmen having but very little Earth to take away before they get it. In Phoenicia and Syria also they have a Gypsum, which they make by burning certain Stones. They have a Gypsum in Thuria too, in great Plenty; as also about Tymphoea, and in the Country of the Perrhoebeans, and many other Places; but these are of a peculiar Kind, and are rather of a stony, than of an earthy Texture.

The Stone from which Gypsum is made, by burning, is like Alabaster; it is not dug, however, in such large Masses, but in separate Lumps. Its Viscidity and Heat, when moistened, are very wonderful.

They use this in Buildings, casing them with it, or putting it on any particular Place they would strengthen. They prepare it for Use, by reducing it to Powder, and then pouring Water on it, and stirring and mixing the Matter well together with wooden Instruments: For they cannot do this with the Hand because of the Heat. They prepare it in this Manner immediately before the Time of using it; for in a very little While after moistening, it dries and becomes hard, and not in a Condition to be used.

This Cement is very strong, and often remains good, even after the Walls it is laid on crack and decay, and the Sand of the Stone they are built with moulders away; for it is often seen, that even after some Part of a Wall has separated itself from the rest, and is fallen down, other Parts of it shall yet hang together, and continue firm and in their Place, by means of the Strength of this Matter which they are covered with.

This Gypsum may also be taken off from Buildings, and by burning, again and again, be made fit for Use. It is used for the casing the Outsides of Edifices, principally in Cyprus and Phoenicia, but in Italy, for a whitening over the Walls, and other Kind of Ornaments within Houses. Some Kinds of it are also used by Painters in their Business; and by the Fullers, about Cloaths.

It is also excellent, and superior to all other Things, for making Images; for which it is greatly used, and especially in Greece, because of its Pliableness and Smoothness.

These Qualities of the Gypsum, therefore, fit it for these and such other Uses; for it seems naturally to have, as it were together, the Heat, and Tenacity of Lime, and the more viscous Earths. But it possesses both these Qualities in a much superior Degree to either of the others, which have them singly; for it acquires, on being moistened, a Heat much greater than that of Lime, and is much more tenacious than the most viscous of the Earths.

That its fiery Power is very great, is evident from this remarkable Instance: That a certain Ship which was laden with Cloaths, by some Accident letting in Water; the Cloaths being wetted by that Means, the Gypsum that was put among them took fire, and burnt both the Cloaths and the Ship.

In Syria and Phoenicia they prepares Gypsum by Fire; putting into proper Furnaces Stones, principally of the Marble, and other Kinds, which are of the most simple Texture, and heating them to a certain Degree; the harder Kinds they lay upon those which burn more readily; and when burnt, the Matter appears to be of extreme Strength, and fitted for enduring a long Time: After this they beat the Stones to Powder like Lime, to make them fit for Use.

From all this it seems evident, that the Properties and Nature of this Matter, are in a great Degree owing to the Fire. FINIS.