

A most pleasant prospect into the garden of naturall contemplation, to behold the naturall causes of all kinde of meteors. As well fiery and airy, as watry and earthly ... / [William Fulke].

Contributors

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Most pleasant Prospect.

INTO THE GARDEN
of Naturall Contemplation,
to behold the naturall causes of
all kinde of Meteors

As well fiery and airy, as watry and
earthly : of which sort the blazing Starres,
shooting Starres, Flames in the Aire, &c.
Thunder, Lightning, Earthquakes, &c. Raine, Dew,
Snow, Clouds, Springs, &c. Stones, Metals, and
Earths : To the glory of God, and the
profit of his Creatures.

By *W. Fulke* Doctor of Divinity.

*Praise the Lord upon earth, Dragons, and all Deepes ;
Fire, Haile, Snow, Ice, Windes and Stormes that doe
his will. Psal. 148.*

The third Edition corrected and amended.

L O N D O

Printed by *E. G.* for *William Leake*, and are to be
sold at his shop in *Chancery-lane* neere
the *Rowles*, 1640.

WILLIAM BISHOP OF BAY
TERS or Maintainers thereunto.

Item, Whether the Church of your Parish be now vacant Patron Tythes
no, who is the Patron thereof how long it hath been va- Vacation.
at, who doth receive the tythes, oblations, and other com-
dities during the time of the vacation, and by what autho-
ry, and in what estate the said Church is at this time, and
how long the Parson or Vicar hath had that Benefice.

Item Whether any Minstrels, or any other persons do use
singing or say any Songs or Dictees that be vile or unclean,
and especially in derision of any godly order now set forth
and established.

Item, Whether the Letany in English with the Epistle and
Gospel

Letany in Eng-

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THE FIRST BOOKE]



As much as we intend in
this Treatise, to declare the
causes of all those bodies, that
are generated in the earth, cal-
led Fossilia, as well as those o-
ther Impressions, named of the r height Me-
teors (which no writer hitherto hath done,
that we have seen) the common definition
given by the most Writers, in no wise will
serve us, and whether we may borrow the
name of Meteoron, to comprehend the whole
subject of our worke, we are not altogether
out of doubt, although the philosopher de-
scribing it from doubtfulness, giveth us some
colour so to take it, and peradventure we
might be as well excused to apply it to Mi-
nerals, as other authors are to use it for
earthquakes: yet to avoid all occasions of ca-
biling at words, we shall both define and
also describe the subject of our matter on
this manner: it is a body compounded without
life naturall: & yet to stop one hole, because
here wanteth the name of the thing to be
defined,

defined, it is no new thing to them that have
 Aristotles. read Aristotles woꝝkes, to find a definition
 of that whereof there is no name. But
 what need you be so pꝛecise (will some man
 say?) mean you so to pꝛocēd in all your dis-
 course: no verily, but because many of quick
 iudgement, not considering the stile to be
 attempered to the capacitie of the readers,
 will impute the plainnesse to the igno-
 rance of the Authors, we thought good in
 the beginning to pluck the opinion out of
 their minds (that as the common saying is)
 they may know, we have skill of good man-
 ners, though we little vse them.

The Meteors are deuided after thꝛee
 manner of wayes: first, into bodies perfectly
 and imperfectly mixed: Secondly, into
 moist impressions and drie: Thirdly, into fi-
 ery, ayry, watry, and earthly. According to
 this last diuision, we shall speak of them in
 foure bookes following: but first we must
 be occupied a little in the generall descrip-
 tion of the same, that afterward shall be
 particularly intreated of.

Why they be called vnperfectly mixed.

They are called vnperfectly mixed, be-
 cause they are very soone changed into
 another thing, and resolued into their pro-
 per

per elements of which they doe most consist, as doe all impressions, fyre, ayre, watter: as snow into water, clowdes into waters &c.

Why they be called perfectly mixed.

The last sort, namely earthlie Meteors, are called perfectly mixed, because they will not easily be changed and resolved from that form which they are in, as be Stones, metallis and other minerals.

According to the qualitie of the matter, they are divided into moist & drie impressions, consisting either of Vapors, or exhalations. Vapors are called moist, and exhalations drie, which termes must be well noted, because they must be much used.

Of the generall cause of all Meteors, and first of the materiall cause.

The matter wherof the most part of Meteors doth consist, is either water or earth: for out of the water, proceed vapors, and out of the earth come exhalations.

Vapor, as the philosopher saith, is a certaine watric thing, and yet is not water: an exhalation hath a certaine earthly nature in it, but yet it is not earth.

The materiall cause.

What be vapors and what exhalations.

For the better understanding of Vapors understand that they be, as it were

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What the
middle re-
gion is
shall bee
told after-
ward.

A generall
rule.

What Ex-
halations
be.

fumes or smokes, warme and moist, which will easily bee resolbed into water, much like to the breath that proceedeth out of a mans mouth, or out of a pot of water standing on the fire. These vapours are drawn up from the waters and watery places by the heat of the Sun, even unto the middle region of the ayre, and there after divers manner of meeting with coldnesse, many kind of moist Meteors are generated, as sometimes clouds and raine, sometime snow and haille; and that such Vapours are so drawn up by the Sunne, it is plaine by experience: for if there be a plash of water on a smooth and hard stone, standing in the heat of the Sunne, it will sone be drie, which is none otherwise, but that the Sunne draweth up the water in thinn Vapors: for no man is so fond to say, that it can sticke into stone or mettall, and it is as great folly to thinke, it is consumed to nothing: for it is a generall rule, that that which is once a thing, cannot by changing become nothing: wherefore it followeth, that the water on the stone, as also on the earth, is for the most part drawn up, when the stone or earth is dried.

Exhalations are as smokes that be hoat
and

and dry, which because they be thinnē, and lighter than Vapours, passe the lowest and middle reigion of the ayre, and are carried up even to the highest region, where for the excessive heat, by neerenesse of the fire, they are kindled, & cause many kind of impressions. They are also sometimes viscole, that is to say, clammy, by reason whereof, they cleaving together and not being dispersed, are after diuers sorts set on fire, and appeare sometimes like Dragons, sometime like Goates, sometimes like candles, sometime like speares.

By that which is spoken of Vapours and Exhalations, it is obliuent, that out of the fire and ayre, no matter whereof Meteors should consist, can be drawn, because of their subtilty and thinnesse. For all Exhalations is, by making a grosser body more thinnē: but the fire (we meane the elementall fire, and not the fire of the kitchen chimney) is so subtil and thinnē, that it cannot bee made thinner: likewise the ayre is so thinnē, that if it be made thinner, it is changed into fire: and as the fire, if it were made thicker, would become ayre, so the ayre being made grosser, would be turned into water. Wherefore to conclude

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The effi-
cient
cause.

this part, the great quantitie of matter, that consisteth these Speteozs, is taken out of the earth and the water. As for the aire and the fire, they are mixed with this matter as with all other things, but not so abundantly, that they may be said the materiall cause of any Speteoz, though without them none can be generated. The efficient cause of all Speteozs is that cause which maketh them, even as the Carpenter is the efficient cause of an house. This cause is either first or second.

The first and efficient cause is God the worker of all wonders, according to that testimony of the Psalmist, which saith, Fire, hails, snow, ice, wind and frost, doe his will and commandement, he sendeth snow like wooll, &c. Almighty God therefore being the first, principall and vniuersall cause efficient of all naturall works and effects, is also the first cause of these effects, whose profit is great, and operation marueylous.

The second cause efficient, is double, either remote, that is to say, farre off or next of all. The farther cause of them, as of all other naturall effects, are the same, the Sun with the other Planets and Stars, and the verie heauen it selfe in which they are mo-
ued

ned. But chiefly the Sunne, by whose heat all or at least wile, the most part of the vapors and exhalations are drawne up.

The next causes efficient as the first qualities, are heat and cold, which cause divers effects in vapors and exhalations.

But to returne to the heat of the Sunne, which is a very neere cause, it is for this purpose two waies considered.

One way, as it is meane and temperate.

Otherwise, as it is vehement & burning. The meane, is by which hee draweth vapors out of the water, and exhalations out of the earth, and not onely draweth them out, but also lifteth them vp very high from the earth into the aire, where they are turned into diuers kinds of Meteors.

The burning heat of the Sunne is, by which hee burneth, dissipateth and consumeth the vapors and exhalations before he draweth them up, so that of them no Meteors can be generated.

These two heats proceed from the Sun, either in respect of the place, or the time, but most properly according to the casting of his beames either directlie or undirectlie.

In place where the Sunnes beames

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Strike directly against the earth and the water, the heate is so great, that it burneth up the Exhalations and Vapours, so that there are no fiery Meteors, much lesse watery, as it is in the South parts of the world, under and neere to the Equinoctiall line.

But in places where the beames are cast indirectly & obliquely, and that where they are not too nigh to the direct beames, nor too farre off from them, there is a moderate heate, drawing out great abundance of matter, so that in those Countries, many Meteors of many sortes are generated, as in the far South parts are few but watery impressions. Also in Autumne and Spring, are oftener Meteors seene, than in Summer and winter, except it be in such places, where the Summer and Winter are of the temper of Spring and Autumne. Let this be sufficient for the efficient causes of impressions, as well first and principall, as second and particular. Concerning the small and finall cause, we have little to say, because the one is so secret, that it is known of no man: the other so evident, that it is plaine, to all men. The essentiall forme of all substances, Gods wisdom compze.

comprehendeth, the uniuersall chiefe and last end of all things, is the glozy of God. Middle ends (if they may be so called) of these impressions, are manifold profits to Gods creatures, to make the earth fruitful, to purge the aire, to set forth his power, to threaten his vengeance, to punish the world, to move to repentance, all the which are referd to one end of Gods eternall glory, euer to be praised, Amen.

Of the places, in which they
are generated.

The places in which Meteors are caused, be either the ayre or the earth: in the ayre be generated raine, hayle, snow, dew, blazing stars, thunder, lightning, &c. In the earth be welles, springs, earthquakes, metals, minerals, &c. made, and as it were, in their mothers belly begotten and fashioned. But for the better understanding hereof, such as have not tasted the principles of Philosophy, must consider that there be foure elements, Earth, Water, Ayre, and Fire, one compassing another round about, saving that the waters by Gods comandement are gathered into one place, that the land might appeare. The highest is the spheare of the Fire, which toucheth

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What the
regions of
the aire be.

toucheth the hollownesse of the moones hea-
uen: the next is the aire, which is in the
hollownesse of the fire: the aire within his
hollownesse, comprehendeth the water and
the earth, which both make but one sphere
or Globe, or as the common sort may un-
derstand it, one ball. So each element is
within another, as the scales of a pottle are
one above another: or (to use a grosse simi-
litude) as the pales of an Onion are one
within another: after the same sort from
the highest heauen to the earth, that is low-
est, one part that is greater compasseth
round about another that is lesser. But for
this present purpose it is to be knowne,
that the aire is deuided into three regions, &
highest, the middle and the lowest. The high-
est because it is next to the region of the fire
is exceeding hot: the lowest being next the
earth & waters, is temperate, & by reper-
cussion or striking backe of the Sun beames
warreth hot, and by absence of them is made
cold, being subiect to winter and summer.
The middle region of the aire, is alwaies
exceeding cold, partly because the sun beames
cannot be cast back so high, and partly be-
cause the cold that is there, betwene the
heate above, and the heat beneath it, is so
kept

kept in, that it cannot get out, so that it
must needs be exceedingly cold: for the wa-
ter and the earth being both cold Elements
after the sun setting in the night season, doe
coole the aire, even to the middle region.
But in the morning the sunne rising war-
meth the aire, so farre as his beames which
are beaten backe from the earth and the
water, can extend and reach, which is not so
high as the middle region, and by heat on
both sides is inclosed and kept, saving that
a little thereof falleth downe in the night,
which the next day with much more is dy-
men backe againe. Wherefore this region
being so cold, is dark and cloudy, in so much
that some doling Divines have imagined
purgatory to be there in the middle region
of the aire. In the highest region be gene-
rated Comets or blazing starrs and such like
of divers sorts. In the middle region clouds
raine, stormes, windes &c. In the lowest re-
gion, dew, frost, hoze-frost, mists, bright
rods, candles burning about grasses, and ga-
lowses, where there is stoe of clamy, sattie
or oily substance, also lights and flaming
fiers, scene in fields, &c,

¶ And thus much for the generall causes
of all Meteors.

THE



THE SECOND BOOKE of fiery Meteors.



Fiery impression, is an Ex-
halation set on fire, in the
highest or lowest region of
the ayre, or else appearing
as though it were set on fire
and burning.

They are therefore divided into flames
and apparitions. Flames are they, which
burne indeede, and are kindled with fire.
These are discerned by foure ways: by the
fashion of them, by their place, by the a-
bundance of their matter, and by the want
of their matter. Their placing is after
the abundance and scarcity of the matter
whereof they consist: for if it be great, hea-
vy and grosse, it cannot be carried so farre
as the middle region of the ayre, and there-
fore is set on fire in the lowest region: if it
be not so great, light, and full of heat, it
passeth the middle region, and ascendeth to
the highest, where it is easily kindled and
set on fire.

According to their diuers fashions, they
have diuers names: for they are called bur-
ning Rubble, torches dawning or leaping
Coates

Coates, shooting or falling starres, or candles burning beams, round pillars, spears, shields, Globes or bowles, firebrands, lampes, flying Dragons or fire drakes, painted pillars or broched steeles, or blazing starres, called Comets. The time when these impressions doe most appeare, is the night season: for if they were caused in the day time, they could not be seene, no more than the starres be seen, because the light of the Sunne which is much greater, dimmeth the brightnes of them being lesser.

Of the generation of the impression, called burned stubble or sparckles of fire.

The generation of this Meteor is this: Sparks of fire. When the matter of the Exhalation is in all parts alike thin, but not compacted or knit together, then some part of it being carped up into the highest Region, by the fiery heat is set on fire befoze another part, that cometh up after it, & so being kindled by little & little, lieth abroad like sparkles out of a chimney, insomuch that the common people suppose, that an infinite number of stars fall down, whereas it is nothing else, but the Exhalation that is thin, kindled in many parts, sparkling, as when sawdust or cole-dust is cast into the fire.

Of

D. Fulkes booke

Of Torches.

Torches.

Torches or firebrands are thus generated: when the matter of the exhalation is long and not broad, being kindled at one end thereof in the highest region of the ayre it burneth like a torch or firebrand, and so continueth till all the matter be burned up, and then goeth out, none otherwise than a Torch, when all the stoffe is spent, must needs burne no longer.

Of dancing or leaping Goats.

Dancing
Goats.

Dancing Goats are caused when the exhalation is divided into two parts, as when two torches be sene together, and the flame appeareth to leape or dounce from one part to the other, much like as balls of wild fire dounce up and downe in the water.

Of shooting and falling stars.

Shooting
Stars.

A Flying, Shooting, or falling star, is when the exhalation being gathered as it were on a round heape, and yet not thoroughly compacted in the highest part of the lowest region of the ayre, being kindled by the sudden cold of the middle region, is beaten backe, and so appeareth as though a starre should fall, or slide from place to place. Sometimes it is generated after another sort, so there

for there is an exhalation long and narrow which being kindled at one end, burneth swiftly, the fire running from end to end, as when a like thread is set on fire at the one end. Some say it is not so much set on fire, as that it is direct under some Starre in the firmament, and so receiving light of that Starre, seemeth to our eyes to bee a Starre. Indeed sometimes it may be so, but that it is not so alwayes, nor yet most commonly, as it may be easily demonstrated.

The Epicurians, as they are very grosse in determining the chiefe goodnesse: so they are verie fond in assigning the cause of this Meteor. For they say, that the Starres fall out of the firmament, and that by the fall of them, both thunder and lightning are caused: for the lightning (say they) is nothing else but the shining of that Starre that falleth, which falling into a watric cloude, and being quenched in it, causeth that greate thunder, even as hot yron maketh a noise if it bee cast into cold water. But it is evident, that the Starres of the firmament cannot fall, for GOD hath set them fast for ever, hee hath given them a Commandement which they shall not passe. And though they should fall

The Epicurians
Opinion.

Pl. 148.

D. Fulkes booke

fall into the cloud, yet could they not rest there, but with their weight being driven down, would cower the whole earth.

The great-
nes of
Starres.

For the least starre that is seen in the firmament, is greater than all the earth. Here will step forth some merry fellow, which of his conscience thinketh them not to be above three yards about, and say it is a loud lie, for he can see within the compass of a bushell, more than xx. stars. But if his bushell were on fire xx. myle of, I demand how bigge it would seeme unto him: He that hath any wit, will easily perceive, that starres being by all mens confession, so many thousand miles distant from the earth, must needs be very great, that so far off should be seen in any quantity. Thus much for the shooting or falling starres.

A prooffe
of the
Starres
greatnes.

Of burning Candles.

Burning
candles.

When the Exhalation carried up into the highest part of the ayre, is in all parts thereof of equall and like thinnes, & also long, but not broad, it is set on fire and blazed like a candle, untill the Exhalation be quite consumed.

Burning
Beames
and round
pillers.

Of burning Beames and round pillers.
These are caused, when the Exhalation
being

being long and not very broad, is set on fire all at once, and so burneth like a great beame or logge. The difference of beames and pillars is this: for beames are when they seeme to lie in length in the ayre, but they are called pillars, when they stand right up, the one end neerer to the earth, than the other.

Of burning speares.

Burning speares are generated, when Burning
Speares.
a great quantity of exhalations, which may be called a dry cloud, is set on fire in the middelt, and because the cloud is not so compact, that it should suddenly rend, as when thunder is caused, the fire breaketh out at the edges of the cloud, kindling the thinn Exhalations, which shoot out in great number like fiery speares, or darts, long & very small, wherefore they continue not long: but when they fayle, within a short while after, more fire breaking out, they shoot as many more in their place: and likewise, when they are gone, other succeed, if the quantity of the matter will suffice, more than a dozen courses. This impression was seen in London, Anno Dom. 1560, the thirti day of
15 January

January, at eight of the clock at night, the ayre in all other places being very darke, but in the North-east where this cloud burned, it was as light as when the day breaketh toward the Sunne rising, in so much, that plaine shadow of things opposite was seene. The edge of this cloud was in fashion like the Raynebow, but in colour very bright, and oftentimes casting forth almost innumerable dartes, of wonderfull length, like squibs that are cast up into the ayre, saving that they moved moze swiftly then any squibs.

Of Shields, Globes or bowles.

Shields
Globes or
Bowles.

These Meteors also have their name of their fashion, because they are broad, and appeare to be round, otherwise their generation differeth not from the cause of the like impressions befoze mentioned.

Of Lampes.

L. m. es.

The Lampe consisteth of an Exhalation that is broad & thick, but not equally extended, namely, smaller at one end than at another, which being kindled about the middle thereof, burneth like a lamp. The cause why, as well this impression, as many other, appeareth round, is not for that alwaies they are round indeed, but because
the

the great distance causeth them to seem so. For even square formes far off seeme to be round. It is witten, that a lamp fell down at Rome, when Germanicus Cæsar set forth the sight of sword players.

Of flying Dragons or fire Drakes.

Flying Dragons, or as Englishmen call them, fire Drakes, be caused on this manner. When a certaine quantity of vapors are gathered together on a heap, being very neere compact, & as it were hard tempered together, this lump of vapors ascending to y^e region of cold, is forcibly beaten back, which violence of moving, is sufficient to kindle it, (although some men will have it to be caused between 2. clouds, a hote and a cold, then the highest part, which was climbing upward, being by reason more subtil & thin, appeareth as the Dragons neck, smoking, for that it was lately in the repulse bowed or made crooked, to represent the Dragons belly. The last part by y^e same repulse turned upward, maketh the tayle, both appearing smaller, for that it is farther off, & also, for that the cold bindeth it. This Dragon thus being caused, flieth along in the ayre, & sometime turneth to & fro, if it meet with a cold cloud to beat it back, to y^e great

Flying
Dragons
or fire
Drakes.

terrour of them that behold it : of whom
 some call it a fire Drake : some say it is
 the Devill himselfe, and so make report
 to other. More than 47. yeres agoe,
 on May day, when many young folke
 went abroad early in the morning, I re-
 member by fire of the clocke in the fore-
 none, there was newes come to Lon-
 don, that the Devill, the same morning,
 was seene flying over the Thames: af-
 terward came word, that he lighted at
 Stratford, and there was taken and set
 in the stocks, and that though he would
 faine have dissembled the matter, by tur-
 ning himselfe into the likenesse of a man,
 yet was he knowne well enough by his
 cloven foote. I knew some then living, that
 went to see him, and returning, affirmed,
 that hee was indeede seene flying in the
 ayre, but was not taken prisoner. I re-
 member also, that some wished hee had
 been shot at with Gunns or shafts, as he
 flew over the Thames. Thus doe ig-
 norant men iudge of these things that
 they know not. As for this Devill, I sup-
 pose, it was a flying Dragon, whereas
 wee speake, very fearefull to looke upon,
 as though hee had life, because he moo-
 veth,

both, whereas he is nothing else but clouds and smoake : so mighty is God, that he can seare his enemies with these and such like operations, whereof some examples may be found in holy Scripture.

Of the Pyramidall pillar like a spire or broched Steeple.

This sharp poynted pillar, is generated Of Spires.
in the highest region of the ayre, and after this sort : When the Exhalation hath much earthly matter in it, the lighter parts and thinner (as their nature is) ascending upward, the grosser, heavier, and thicker, abide together in the bottome, and so is it of fashion great beneath, and small poynted aboue, and beeing set on fire, it is so seene, and thereof hath his name.

Of fire scattered in the ayre.

Fire scattered in the ayre, or illumina- Fire scat-
tered.
tions, are generated in the lowest region of the ayre, when very drye and hote Exhalations are drawne up, and meeting with cold Cloudes, are sent back againe, which motions doe set them a fire; whose parts being not equally thicke or ioyned together, seeme as
though

though fire were scattered in the ayre: yea sometimes, the whole ayre seemeth to burne, as though it would rayne fire from Heauen, & so it hath come to passe, burning both Cities and Townes. When iudge how easy it was for God to raine fire upon Sodom & Gomorra, for their sins & wickednes.

Of lights that goe before men, and follow them abroad in the fields, by the night season.

Light that
goeth be-
fore men
& follow-
eth them
in the
night.

There is also a kinde of light that is seen in the night season, and seemeth to goe before men, or to follow them, leading them out of their way unto waters, & other dangerous places. It is also very often scene in the night, of them that saile in the Sea, and sometime will cleave to the mast of the Shippe, or other high parts, sometime slide round about the Shippe, and either rest in one part till it goe out, or else be quenched in the water. This impression scene on the land, is called in Latine, Ignis fatuus, foolish fire, that hur- teth not, but only feareth soles. That which is scene on the Sea, if it be but one, is named Helena, if it be two, it is called Castor and Pollux.

The foolish fire, is an Exhalation
kindled

kindled by meanes of violent mooving,
when by cold of the night, in the lowest
region of the ayre, it is beaten downe, and
then commonly, if it be light, seeketh to as-
cend upward, and is sent downe againe;
so it danceth up and downe. Else if it move
not up and downe, it is a great lump of
glewish or oyle matter, that by mooving
of the heat in it selfe, is enflamed of it
selfe, as moyst hay will be kindled of it
selfe. In hote and fennie Countries,
these lightes are often seene, and where-
as is abundance of such unctuous and
fat matter, as about Church-yards, where
through the corruption of the bodies there
buried, the earth is full of such substance:
wherefore in Church-yards, or places of
common buriall, oftentimes are such lights
scene, which ignorant and superstitious
soules have thought to be soules tormen-
ted in the fire of Purgatory. Indeede the
devill hath used these lightes (although
they be naturally caused) as strong delu-
sions, to captiue the minds of men, with
feare of the Popes Purgatory, whereby
he did open iniury to the blood of Christ,
which only purgeth us from all our sins,
and delivereth us from all torments, both

tempozall and eternall, according to the saying of the wise-man, The soules of the righteous are in the Hands of God, and no tormēt toucheth them. But to returne to the lights, in which, there are yet two things to be considered, First, why they lead men out of their way. And secondly, why they seeme to follow men and goe before them. The cause why they lead men out of the way, is, that men, while they take heed to such lights, and are also soe afraid, they forget their way, and then being once but a little out of their way, they wander they wot not whither, to waters, pittes, and other very dangerous places. Which, when at length they hap the way home, will tell a great tale, how they have beene led about by a spirit in the likenesse of Fire. Now the cause why they seeme to goe before men, or to follow them, some men have said to bee the mobing of the ayze, by the going of the man, which ayze mobed, should drive them forward, if they were before, and draw them after if they were behind. But this is no reason at all, that the Fire, which is oftentimes three or foure miles distant from the man that

that walketh, should bee mooved to and fro by that ayze which is moted through his walking, but rather the moving of the ayze and the mans eyes, causeth the fire to seeme as though it moved: as the Moone to childzen seemeth, if they are before it, to run after them: if shee be before them, to run before them, that they cannot overtake her, though she seeme to be very neere them. Wherefore these lights rather seeme to moove, than that they be moved indeed.

Of Helena, Castor, and Pollux.

VVhen the like substance in the lowest region of the ayze, over the Sea, by the like occasion is set on fire, if it be one only, it is called Helena, if there be two, they are called Castor and Pollux. These impressions will oftentimes cleave to the mast, and other parts of the Ships, by reason of the clamminesse and fatnesse of the matter. Helena was of the Heathen men, taken as a Goddesse, the daughter of Jupiter and Leda. Castor and Pollux were her brethren. Helena was the occasion that Troy was destroyed: therefore the Mariners by experience trying, that one flame

Helena,
Castor,
Pollux.

flame of fire appearing alone, signified
 tempest at hand, supposed the same flame
 to be the goddess Helena, of whom they
 looked for nothing but destruction. But
 when two lights are seene together, they
 are a token of faire weather, and good luck:
 the Mariners therefore believed, that they
 were Castor and Pollux, which sayling
 to seeke their sister Helena, being caried
 to Troy by Paris, were never seene af-
 ter and thought to be translated into the
 number of the Gods that give good suc-
 cesse to them that sayle, as we read in
 the last Chapter of the Actes of the Apo-
 stles, that the Shippe wherein S. Paul
 sayled, had a badge of Castor and Pollux.
 A naturall cause why they may thus fore-
 shew either tempest or calmnesse, is this.
 One flame alone may give warning of
 a tempest, because that as the matter
 thereof is compact, and not dissolved, so
 it is like, that the matter of tempest
 (which never wanteth) as winde and
 cloudes, is still together, and not dis-
 sipated, then is it like not long after to
 arise. By two flames together may be
 gathered, that as this Exhalation which
 is very thick, is divided: so the thick
 matter

matter of tempest is dissolved and scattered abroad, by the same cause that this is divided. Therefore not without a reason, the Partner to his mates may promise a prosperous course.

Of flames that appeare upon the haire
of men or beasts.

There is yet another kind of fiery impression, which is flames of fire upon the haire of men & beasts, especially horses. These are sometime clammy Exhalations, scattered abroad in the ayre in small parts, which in the night, by resistance, of the cold, are kindled, cleaving on horses eares, on mens heades and shoulders that ride or walke. In that they cleave upon hayres, it is by the same reason, that the dew will be seene also upon hayres or garments, whose wooll is high, as frysle mantels and such like. Another sort of these flames, are caused, when mens or beasts bodie being chafed, send forth a fat & clammy sweat, which is in like maner kindled as the sparks of fire that are seene when a black horse is curried. Livius reporteth of Servius Tullius, that as he lay asleep, being a child, his hayre seemed to be all on a flame, which

Flames
upon
haire of
men and
beasts.

Livius.
Servius
Tullius.

Marius.

for all that, did not burne his haire, or hurt him. The like history he reciteth of one Marius, a Knight of Rome, that as he made an Oration to his Souldiers in Spaine, they saw his head burning on a light fire, and himselfe not aware of it. Thus much concerning these flames.

Of Comets or Blazing Starres.

Comets or
blazing
Starres.

A Comet is an Exhalation, hote and drie, of great quantity, fat & clammye, hard compact like a great lumpe of pitch, which by the heat of the Sunne, is drawne out of the earth, into the highest region of the ayre, and there, by the excessive heat of the place, is set on fire, appearing like a starre with a blazing tayle, and sometime is moved after the motion of the ayre, which is circular, but it never goeth downe out of the compasse of sight, though it be not seene in the day time for the brightnesse of the Sunne, but still burneth untill all the matter be consumed. An argument of the greatnesse is this, that there was never any Comet yet perceived, but at the last it endured 7. dayes: but much longer they have been seen, namely, forty dayes long, yea, foure-

fourtescoze daies, and some, fire moneths together. Wherefore it must needs be a wonderfull deale of matter, that can geve so much nourishment, for so great and fervent fire, and for so long a time. There are considered in a Comet, specially the colour and fashion, which both arise of the disposition of the matter. Their colours be either white, ruddie, or blew. If the matter be thinne, the colour is white. If it bee meanely thick, then is the Comet ruddie, after the colour of our fire: but when the matter is very thick, it is blew, like the burning of Wism- stone. And as the matter is more and lesse, after this disposition: so is the Comet of colour, more or lesse like to these three principall colours, some yellowish, some duskyish, some greenish, some wat- chet, &c.

In fashion are noted three differences, for either they seeme round, with beames round about, or with a beard hanging downeward, or else with a tayle stretch- ed out sidelong, in length. The first fa- shion is, when the matter is thickest in the middell, and thinne round about the edges. The second is, when the Exha-
lation

lation is upward thick, and in length
downeward also, meanelly thick. The
third foyme is like the second, saving
that the taile hangeth not downe, but
lyeth aside, and is commonly longer than
the beard. The time of their generation
is oftenest in Autumne or haruest. For
in the spring, there is too much moisture,
and too little heate, to gather a Comet. In
summer, is too much heate, which will
disperse and consume the matter that it
cannot bee loyned together. As for win-
ter, it is cleane contrary to the nature of
a Comet, which is hote and drie winter
being cold and moist: therefore no time so
meet as Autumne.

The tem-
per of the
4. quar-
ters.

The signi-
fication of
Comets.

Now for so much as many learned men
have gone about to declare the significati-
on of blazing starres, we will omit nothing
that hath any shadow of reason, but de-
clare what is written of them.

Such things as are set forth of the beto-
kening of Comets, are of two sortes: the
first is of naturall, the second of civill or
politike effects, They are said to betoken
drought, barrennes of the earth & pestilence.

Drought, because a Comet cannot be
generated without great heate, and much
moisture

moysture is consumed in the burning of it. Barrennes, because the fatnesse of the earth is drawn up, whereof the Comet consisteth.

Pestilence, for so much as this kinde of Exhalation corrupteth the ayre, which infecteth the bodies of men and beasts.

The second sort might well be omitted, saving that Aristotle himselfe disdaineth Aristotle. not to seeke out causes for some of them. Generally it is noted of all Historiographers, that after the appearing of Comets, most commonly follow great and notable calamities. Beside this, they betoken (say some) warres, seditions, changes of common wealths, and the death of Princes and noble men.

For what times Comets do shine, there be many hote and dry Exhalations in the ayre, which in dry men kinde heat, whereby they are provoked to anger: of anger cometh brawling, of brawling, fighting & warre, of warre, victoꝝ: of victoꝝ, change of common wealths. When also Princes living more delicately than other men, are more subiect to infection, therefore die sooner than other men. If it were lawfull to reason of this sort, we might enduce them to betoken, not only these few things, but all other things that chance in the world.

Yet

Yet these predictions have a shew of reason, though it be nothing necessary: but it is a word, to see, how the Astrologians dote in such devices. They are not ashamed, to ascribe an earthly substance, to ascribe an heavenly influence, and in order of iudgment to use them as very starres. Surely, by as good reason as to the celestiall starre, they attribute diuine influences and effects. But this their folly hath been sufficiently detected by diuers godly and learned men, and this place requireth no long discourse thereof. Wherefore this shall suffice, both for the naturall causes of blazing starres, and also, for all flames in generall. It followeth therefore, that with like breuity we declare the causes of fiery apparitions.

Of Apparitions.

Apparitions.

A Apparition, is an Exhalation in the lowest or highest region of the ayre, not verily burning, but by refraction of light either of the Sunne or the Moone, seemeth as though it burned. Which appearance of colour, riseth not of the mixture of the foure qualities, as it doth in bodies perfectly mixed, as hearbes, stones

stones, &c. but onely the falling of light upon shadow. The light is in stead of white, & the shadow or darknes in stead of black. These diversly mixed according to the divers disposition of the Exhalation, which ministreth variety by thicknesse or thinnesse, cause divers colours.

There bee commonly recited three kinds of fyer apparitions.

Colours, wide gapings, and deepe holes, which appeare in the clouds.

Of colours.

Colours are here meant, when there is nothing else to be noted, but the colours of the clouds, and they are caused (as it is sayd) by casting the light into the shadowy cloud, according as it exceedeth more or lesse in thicknesse, whereof some be very bright white, and that is when the Exhalation is very thin: some yellowish, when the Exhalation is thicker: some ruddy, when it is meanly thick; and very black, when it is very thick. The red and ruddy colours are seen only in the morning and evening, when the light of the Sunne is not in his full force, for at other times of the day, his light is too vehement, cleare, strong, and pearcing. Thus much of colours.

Colours in
the ayre.

C

Of

Of wide gaping.

Wide gaping of clouds in the ayre.

Wide gaping is caused, when an Exhalation is thick in the midst, and thin on the edges, then the light being receiued into it, causeth it to appear as though the sky did rend, and fire breake out of it.

Of round opening Hiatus.

Round opening in the ayre.

These holes called Hiatus, differ from wide gapings, in nothing, but that they be lesse, and therefore seeme as though they were deepe pits or holes, and not rending or gaping, and these be those apparitions that appeare fiery, & yet be not so indeed. Therefore let this be sufficient to haue shewed the naturall causes of all fiery Meteors.

The third Booke of Ayry impressions.



Vnder the name of ayry impressions, be comprehended such Meteors, whose matter is most of the aire. Of this sort be windes, earthquakes, thunder, lightnings, stormes, winds, whirle winds, circles, rainebowes, the white circle, called of some, Watling Street, many Sunnes, many Moones.

Of

Of Windes.

The wind is an Exhalation hot and dry, Windes,
drawn up into the ayre by the power of
the Sun, & by reason of the waight thereof
being driven downe, is laterally or side-
longs caried about the earth, and this definiti-
tion is to be understood, of generall winds
that blow over all the earth, or else some
great regions: but besides these, there be par-
ticular winds, which are knowne but only
in some countries, & them not very large:
these winds oftentimes have another ma-
ner of generation, & that is on this manner.
It must needs be confessed, that within the The se-
cond kind
of winds.
globe of the earth, be wonderful great holes,
caves, or dungeons, in which when ayre a-
bondeth (as it may by divers causes) this
ayre that cannot abide to be pinned in fin-
deth a little hole, in or about those coun-
tries, as it were a mouth to breake out of,
and by this meanes bloweth vehemently:
yet that force & vehemency extendeth not
farre, but as the wind that cometh forth
of bellows, neere the coming forth is
strong, but far of, is not perceived. So this
particular wind, in that country where it
breaketh forth, is very violent & strong, in
so much, that it overthoweth both trees

and houses, yet in other countries, not very farre distant, no part of that boysterous blast is felt. Wherefore this wind differeth from the generall winds both in qualities and substance or matter: for the matter of them is an Exhalation, and the qualities such as the nature of the Exhalation is, very ayze, but not ayze indeede: but of this particular wind, the matter and substance is most commonly ayze.

The third
kinde of
winde.

There is yet a thirde kinde of winde, which is but a soft gentle and coole moving of the ayze, and cometh from no certaine place (as the generall wind doth) yea, it is felt in the Madow under Trees, when in the hote light and shining of the Sunne, it is not perceived. It cometh whisking suddatnely, very pleasant in the heate of the Summer, and ceaseth by and by. This properly is no wind, but a moving of the ayze by some occasion. As for the generall winds, they blow out of divers quarters of the ayze now East, now West, now South, now North, or else enclining to one of the same quarters. Among which the East-wind following the nature of the fire, is hote and drye, the South-wind expressing the qua-
lities

lity of the ayre, is hote and moyſt, the
 Weſterne blaſts, agreeing with the wa-
 ters property, is cold and moyſt. The
 North, that never was warmed with the
 heat of the Sunne, being cold and dry,
 partaketh the conditions of the Earth.
 The middle windes have middle and
 mixed qualities, after the nature of thoſe
 foure principall windes more or leſſe,
 as they encline toward them more or
 leſſe.

The quali-
 ties of the
 winds and
 the foure
 quarters of
 the world.

The quali-
 ty of mid-
 dle wind.

The profit
 of wind.

Generally the profit of all windes,
 by the wonderfull wiſdoms of the Eter-
 nall God, is wonderfull great, unto his
 creatures. For beſides that theſe windes
 alter the weather, ſome of them bring-
 ing raine, ſome drowneſſe, ſome froſt and
 ſnow, which all are neceſſary, there is
 yet an univerſall commoditie, that riſeth
 by the only moving of the ayre, which
 were it not continually ſtirred, as it is,
 would ſone putrifie, and being putry-
 fied, would be a deadly infection to all that
 hath breath upon the Earth. Wherefore
 this winde, whoſe ſound we heare, and
 know not from whence it cometh, nor
 whither it goeth (for who can affirme
 from whence it was rayſed, or where it

John. 3.

Psal. 104.

is laid downe : (as all other creatures beside doe teach us the wonderfull and wise providence of God) that we may worthily cry out with the Psalmist, and say: O Lord, how manifold are thy works, in wisdom hast thou made them all, &c. Let this be sufficient to have shewed the generation of the winds.

Of Earthquakes.

Earth-
quakes.

A Earthquake, is a shaking of the earth which is caused by meanes of winde & Exhalations, that be enclosed within the caves of the earth, and can find no passage to breake forth, or else so narrow a way that it cannot soone enough bee delivered. Wherefore, with great force and violence it breaketh out : and one while shaketh the earth, another while rendeth and cleaveth the same : sometime it casteth up the earth, a great height into the ayre, and sometime it causeth the same to sinke a great depth downe, swallowing both Cities and Townes, yea and also mighty great Mountaines, leaving in the place where they stood, nothing but great holes of an unknowne depth, or else great lakes of waters.

Of

Of divers kinds of Earthquakes.

Divers Authours wyte diversly, of the kinds of earthquakes, some making moze and some lesse, but we shall be content at this time to comprehend them in foure sorts.

Divers
kinds of
Earth-
quakes.

The first kinde is when the earth is shaken laterally, to one side, which is, when the whole force of the winde, dri- veth to one place, and there is no other contrary motion to let it. This winde, if it be not great, shaketh the earth, that it trembleth as a man that hath a fit of an ague, and doth no moze harme: but if it be great and violent, it looseth the foundations of all buildings, be they never so strong, and overthroweth whole Cities, but especially the great build- ings, and not only such buildings, but sometimes also casteth downe great Hilles, that cover and overthrowe all the valley under them. Many noble and great Cities have been overthrowne by this kind of earthquake. It is written, that twelue of the most beautifull Ci- ties, and most sumptuous buildings in all Asia, where overthrowne and utterly

Twelve
Cities o-
verthrown
with one
earth-
quake.

destroyed with an earthquake. How often Antiochia, yea, within short time was destroyed, they which have read the Histories, can testifie. How terrible was the earthquake that shooke Constantino-
 ple a whole yere together, that the Em-
 perour, and all the people, were faine to
 dwell abroad in the fields, under tents and
 pabillions, for feare their houses would
 fall on their heads, it is recorded in Chro-
 nicles, and worthy to be remembred.

Constanti-
 nople the
 chiefest
 citie of
 Greece,
 now the
 Turkes
 Palace.

The se-
 cond kind.

The second kinde is, when the
 earth with great violence is lifted up,
 so that the buildings are like to fall,
 and by and by sinketh downe againe: this
 is, when all the force of the windes Ari-
 beth to get upward, after the nature of
 Gunpowder, and finding some way to
 be delivered out of bondage, the earth
 that was hoysed up, returneth to his old
 place.

The third
 kind.

Earth-
 quake on
 the Sea.

The third kinde is a gaping, ren-
 ding, or cleaving of the earth, when the
 earth sinketh downe, and swalloweth
 up Cities, and Townes, with Castles, and
 Towers, Hilles and Rocks, Riuers, and
 Floods, so that they be neuer seene againe.
 Yea the Sea in some places hath beere

Drunke

drunke up, so that men might have gone
 over on foote, untill the time of tyde or
 flood returning covered the place with
 waters againe. But in the land, where
 this earthquake swalloweth up any Ci-
 ty, or Country, there appeareth nothing
 in the place thereof, but a marvellous
 wide and deepe gulfe, or hole, Aristotle
 maketh mention of divers places, and re-
 gions that were overthrowne with this
 kinde of earthquake.

The fourth kinde, is when great
 mountaines are cast up out of the earth,
 or els when some part of the land sinketh
 downe, and in stead thereof arise Rivers,
 Lakes, or Fires breaking out with smoake
 and Ashes. It causeth also overflowings
 of the Sea, when the Sea bottome is li-
 fted up, and by this meanes arise many
 lands in the Sea, that never were seene
 before. These and other such miracles, are
 often to be found in the writers of Histo-
 ries, also in the Philosophers, as Aristotle,
 Seneca, and Plinius.

Nevertheless, the effects of some as
 most notable, it shall not be unprofita-
 ble to recite. Plato in his Dialogue, inti-
 tled Timæus, maketh mention by the way

of

Aristot.

The fourth
 kind.

New
 Islands in
 the Sea.

Arist:
 Seneca.
 Plinius.

Caro.

A wonder-
full earth-
quake.

Africa,
Europa,
Asia, the
three parts
of the earth
Mare medi-
terraneū,
because it
goeth thro-
row the
midst of
the earth.
Atlantis an
Iland.

Seneca.
Theron &
Therea.

Arist. He-
rodorus.
Egypt
sometime
a gulph of
the Sea.

of a wonderfull earthquake, whereby not
only Africa was rent asunder from Eu-
rope and Asia (as it is indeed at this day,
except a little neck by the red Sea) the
Sea entring betwene them that now is
called Mare mediterraneum : but also a
wonderfull great Iland, which he affir-
meth, was greater then Africa and Asia
both, called Atlantis, was swallowed up,
and covered by the waters, in so much,
that on the Sea called Atlanticum, for a
great while after, no Shippe could sayle,
by reason that the same huge Sea, by re-
solution of the earth of that mighty I-
land, was all turned into mudde. The
famous Ile of Sicilia was also sometime
a part of Italy, and by earthquake rent a-
sunder from it. Seneca maketh mention
of two Ilands, Theron and Therea, that
in his time first appeared. It should seeme
both by Aristotle, and also by Herodorus,
that Egypt, in ancient time, was a
gulph of the Sea, and by earthquake
made a drie land. During the reigne of
Tiberius the Emperour, twelue notable
Cities of Asia were overthrowne in one
night, &c.

How

How so great winds come to be
under the Earth.

The great Caves and Denues of the Earth, must needs be full of ayre continually : but when by the heate of the Sunne, the moisture of the Earth is resolved, many Exhalations are generate as well within the Earth, as without, and whereas the places were full before, so that they could receive no more, except part of that which was in them, nor let out, in such countries, where the Earth hath few pores, or else where they be stopped with moisture, it must needs follow, that these Exhalations striving to get out, must needs rend the Earth in some place, or lift it up, so that either they may have free passage, or else room enough to abide in.

Of the signes and tokens that goe before an earthquake most commonly.

The first is the raging of the Sea, when there are no tempestuous winds to stirre it, yea, when the ayre is most calme without winds. The cause why the Sea then rageth, is, that the wind beginneth to labour for passage, that

The signes of an earthquake.

that way, and finding none is sent back, and
come after shaketh the land.

The second signe is calminesse of the
ayze, and cold, which commeth to passe,
by reason that the Exhalation, that should
be abroad, is within the earth.

The thirde signe, is said to be a long
thinne strake of cloud sene, when the
skie is cleare, after the setting of the Sun.
This (say they) is caused, by reason that
the Exhalation or vapor, which is the
matter of cloudes, is gone into the earth.
Other affirme, that it is the Exhalation
that breaketh out of some narrow hole of
the earth, out of which the rest of the wind
cannot issue, neither will it waite the
time: wherefoze within a while after, it
seeketh and maketh it selfe, by sudden e-
ruption, a broader way to be deliuered out
of prison.

Also the Sunne, certaine daies befoze
it appeareth dimme, because the winds,
that should have purged and dissolved the
grosse ayze, that causeth this dunnesse to
our eyes, is enclosed within the bowels of
the earth.

The water in the bottome of deepe
welles is tronbled, and the saour thereof
infec-

infected, because the pestilent Exhalations
 y have been long inclosed within the earth,
 doe then beginne a little to be sent abroad.

For thereof commeth it, that in many pla-
 ces where earthquakes have beene, great
 abundance of smoke, flame, and ashes,
 is cast out, when the abundance of bym-
 stone that is under the ground, through
 violent motion is set on fire, and breaketh
 forth. Finally, who knoweth not, what
 stinking minerals and other poysonous
 stufte doe grow under the earth? where-
 fore it is no wonder, if well-water, befoze
 an earthquake, be infected: but rather it is
 to be marvelled, if after an earthquake,
 there follow not a grievous pestilence,
 when the whole masse of infection is blown
 abroad.

Last of all, there is heard befoze it,
 in the time of it, and after it, a great noise
 and sound under the earth, a terrible
 groaning, and a very thundering, yea,
 sometimes when there followeth no
 earthquake at all, when as the winde,
 without shaking of the earth, findeth a
 way to passe out at. And these for the
 most part, or at least some of them, are
 forewarnings, that the most fearefull
 earth-

Thunder-
 ing under
 the earth.

John A.
 1683

Cato.

earthquake will follow, than the which there is no naturall thing, that bzingett men into a greater feare. Cato was very curious to confesse himselfe, that he repented, that eber he went by water, when as he might have gone by land. But what land can be sure, if it be the Lords will, by this worke of his to shake it? what building so strong, that can defend us, when the moze strong, the moze danger, the higher, the greater fall.

Of Thunder.

Thunder.

Thunder is a sound caused in the clouds by the breaking out of a hote & drye Exhalation, beating against the edges of the cloud. It is often heard in spring & summer by reason that the heat of the sun then draweth up many Exhalations, which meeting in the middle region of the ayre, with cold & moist vapors, are together with them, inclosed in an hollow cloud: but when the hot Exhalation cannot agree with the coldnesse of the place, by this strife being driven together made stronger and kindled, it will neber breake out, which sudden & violent eraption causeth the noyse which we cal thunder. A similitude is put by great authoꝝs, of moist wood that cracketh

A similitude.

in

in the fire: we may adde hereunto the breaking of an egge in the fire, of an apple, or any like thing: for whatsoeuer holdeth and withholdeth enclosed any hote wind, so that it can haue no vent, it will seeke it selfe a way, by breaking the skin, shell or case. It were no ill comparison, to liken thunder to the sound of a gunne, which be both caused of the same or very like causes.

The sound of thunder is diuers, after which, men haue deuised the thunder into diuers kinds, making first 2. sorts, that is, small thunder & great. But as for the diuersity of sounds, generally it comes of the diuers disposition of the cloude, one while hauing moze holes than at another, sometime thicker in one place, than in another. The small or little thunder, is when the Exhalation is driuen from side to side of that cloude, making a noyse, & either for the small quantity, & lesse forciblenes, or else for the thickness of the clouds wals, is not able to breake them, but rumbleth up & downe within the cloude, whose sides be stronger than the force of the Exhalation is able to breake, it runneth up & downe within, & striking against the cloude & moist sides, maketh a noyse, not unlike to the quenching of hote iron in cold water.

Divers
kinds of
Thunder.

Small
Thunder,
and the
kinds
thereof.

And

And if the Exhalation be meanly strong, and the cloud not in all places of like thicknesse, it breaketh out at those thin places with such a buzzing, as wind maketh blowing out of narrow holes.

But if the cloud be so thinne, that it cannot keepe in the Exhalation, although it be not kindled, then it bloweth out with like puffing, as wind commeth out of a payze of bellowses.

Great
thunder
and the
kinds
theroof

A great thunder, is when the Exhalation is much in quantity, and very hote and drie in quality, the cloudes also very thick and strong, that easily will not gibe place to the wind, to escape out.

Wherefoze if the Exhalation doe vehemently shake the cloud, though it doe not at the first disperse it, it maketh a long and fearefull rumbling against the sides of the cloud, untill at the last being made stronger by swifter motion, it dissolbeth the cloud, and hath liberty to passe out into the open ayze. The cloud dissolved, droppeth downe, and then followeth a shoure of raine.

Otherwhyles it shaketh the cloud, not long, but straightway rendeth it a long

long space and time, whose sound is like the rending of a broad cloth, which noyse continueth a pretty while.

And sometime it discuffeth the cloud at once, making a vehement and terrible crack like a gunne, sometime with great force casting out stones: but most commonly fire, which setteth many high places on fire. As in the yere of our Lord, 1561. the fourth day of June, the Steple of Saint Pauls church in London was set on fire, as it hath beene once or twice before, and burned.

The noyse of thunder, though it be great in such places ober which it is made, yet is it not hard farre off, especially against the winde. Whereof we had experience, also in the yere of our Lord, 1561. on Saint Matthias day in February, at the evening, when there was a great flash of lightning, and a very terrible crack of thunder following, they that were but xv. miles from London Westward, heard no noyse, nor sound thereof: the winde that time was Westerne.

The effect of thunder is profitable to men; both for that the sweete holme doth follow it, and also for that it purgeth

How farre
thunder is
heard.

The profit
of thunder.

Plutar-
chus. T.
Quincius
Flamini-
us.

geth and purifieth the ayre, by the swift
moving of the Exhalation that breaketh
forth, as also by the sound, which dis-
ting and pearcing the ayre, causeth it to
be much thinner: which may be verified
by an History that Plutarchus in the life
of T. Quincius Flaminius reporteth, that
there was such a noise made by the Gre-
cians, after their liberty was restored, that
the Birds of the ayre that flew over them
were seen to fall down, by reason that the
ayre divided by their cry, was made so
thinn, that there was no firmity or
strength in it to beare them up. And let this
suffice for Thunder, whom lightning suc-
ceedeth in treaty, that seldome is from it in
nature.

Of Lightning.

Lightning.

Fulgerū.
Corusca-
tio. Fulgur
Fulmen.

Among the diuers kinds of lightning,
which writers in this knowledge doe
number, we shall entreat only of foure
kinds, yet so, that under these foure, all the
rest may be comprehended. The names we
must borrow of the Latine tongue. The
first is Fulgcrum, The second Coruscatio,
the third Fulgur, the fourth Fulmen.

Of

Of Fulgetrum.

Fulgetrum we call that kinde of light-
ning, which is seene on summer nights
and euenings, after a hote day. The
generation hereof is such, when many
thinne, light and hote Exhalations, by the
immoderate heate, have bene drawne
up from the earth, and by the absence of
the sunne be destitute of the force, where-
by they should have been drawne further
upward, yet something ascending by their
owne nature, in that they bee light
and hote, they meete with the cold ei-
ther of the night, in the lowest region, or
else of the ayre, in the middle region, and
so by resistance of contraries (as it hath
bene oft before rehearsed) they are beaten
back, and with the vehement moving set
on fire. This lightning commonly goeth
out in the ayre, terrible to behold, not hurt-
full to any thing: Except sometime, when
the matter of it is earthy and grosse being
stricken downe to the earth, it blasketh
corne, and grasse, with other small hurt.
Sometime it setteth a barne or thacked
house on fire. The colour of this
lightning, as of all other, is diuers,

Fulge-
trum.The co-
lour of this
lightning.

D. Fulkes booke

partly according to the matter, and partly according to the light. If the matter be thinne, it is white, if the substance be grosse, it is ruddy, like flames of fire : in great light, as in the day, it appeareth white, in the night, ruddy : yet sometime in the day time, we may see it yelloe, which is a token that the matter is wonderfull thick & grosse. Old wives are wont to say, that no night in the yeere, except one, passeth without lightning : but that is true, as the rest of their tales, whereof they haue great store.

Of Coruscation.

Corusca-
tion.

Coruscation is a glittering of fire, rather than fire indeed, and a glimmering of lightning, rather than lightning it selfe : which is two manner of wayes ; one way, when clouds that be lower than the upper part of the earth, without the compasse of our sight, are enflamed : and the reflexion of that flame is cast up into our sight, appearing in all points like lightning, saying that the ayre, where it appeareth, is so cleare, that we are perswaded, no lightning can be there caused. Another way, is when there be thick cloudes over us, and commonly a double order of cloudes, one above

aboue an other : if lightning oz any other inflammation be in the upper part of these clouds, the light of them pierceth thozow the lower parts, as thozow a glasse, and so appeareth, as though it lightned, when perhaps it did lighten indeed : yet that which wee saw, was but the shaddow thereof. And this is often without thunder.

Of Fulgur.

Fulgur is that kinde of lightning which followeth thunder, whereof we have spoken befeze. For when that violent Exhalation breaketh forth, making a noyse as it beateth against the sides of the cloud, with the same violence it is set on fire, and casteth a great light, which is seene, farre & nere. And although the lightning appeare unto us, a good pretty while befoze the thunderclap be heard, yet it is not caused befoze the noyse, if any thunder at all doe follow, but either is after it oz with it. Wherefoze that we see it, befoze we heare the thunder, may be ascribed, either to the quicknes of our sight, that prebenteth the hearing, oz else to the swift moving of

The lightning is not before the thunder, though it seeme so.

Sight pre-
venteth
hearing.

the fire and the light thereof, to our eyes, and the slow moving of the sound, unto our eares and hearing. These three kinds of lightnings are more fearefull than hurtfull, but the fourth seldome passeth without some damage doing.

Of the fourth kinde, called
Fulmen.

The most dangerous, violent and hurtfull kind of lightning is called Fulmen, whose generation is such as followeth: What time a hote Exhalation is enclosed in a cloud and breaking the same, bursteth forth, it is set on fire and with wonderfull great force stricken downe toward the earth. The crack of thunder that is made when this lightning breaketh out, is sudden, short, and great, like the sound of a Gunne. And oftentimes a great stone is blowne out with it, which they call the thunder-bolt, which is made on this manner. In the Exhalation which is gathered out of the earth, is much earthy matter, which clottering together by moisture, being clammy by nature, consisting of brimstone, and other metallike substance by

The thun-
der Bolt
cast out of
the clouds.

by the excessive heate, is hardened as a
brick is in the fire, and with the mighty
force of the Exhalation strongly cast to-
ward the earth, and striketh downe tee-
ples, and high buildings of stone, and of
wood, passeth thorow them, and setteth
them on fire, it cleaveth trees and setteth
them on fire: and the stronger the thing is
that resisteth it, the more harme it doth to
it. It is sharpe pointed at one end, and
thick at the other end, which is caused by
reason that the moyster part, as heavier,
goeth to the bottome of it, so is the top
small, and the bottome thick.

Strongest
things are
most hurt
of light-
ning.

Men write, that the thunderbolt goeth
never aboue five fote deepe, when it fal-
leth upon the earth: which standeth with
reason, both because the strength of it is
weakened, before it come so nere the
ground, and also, because the continuall
thicknesse of the earth breaketh the force,
were it never so great.

How deep
a thunder-
Bolt goeth
into the
earth.

Both Aristotle, Seneca, and Plinius
divide this lightning into thzee kinds.

Aristot.
Seneca.
Plinius.

Of the first.

The first is drye, which burneth not,
to be felt, but divideth, and appeareth

Dry light-
ning.

D 4

with

Money
molten in
mens pur-
ses, and
swords in
scabberds.

with wonderfull swiftnesse. For being
subtill and pure, it passeth thorow the
pores of any thing, be they never so small,
and such things, as give place unto it, it
hurteth not, but such things as resist, it
divideth and pierceth. For it will melt mo-
ney in mens purses, the purses being
whole and unharmed. Yea, it will melt a
sword in the scabberd, and not hurt the
scabberd at al. A wine vessell it will cleave,
and yet the wine shall be so dull, that by
the space of thre dayes, it will not runne
out. It will hurt a mans hand, and not his
globe. It will burne a mans bones within
him to ashes, and yet his skinne and flesh
shall appeare faire, as though nothing had
come to him. Yea, otherwise the whole
man in the moment of an houre shall be
burned to ashes, whereas his clothes shall
not seeme to have been touched. It will al-
so kill the child in the mothers belly, and
not hurt the mother: And all because the
matter is very subtill, and thinne, burning,
and passing thorow whatsoever it be, that
will not give it free passage.

Of the second kinde.

Moyst
lightning.

The second kinde is moyst, and be-
cause it is very thinne, it burneth not
to

to ashes, but onely blaketh or scozeth
trees, cozne and grasse: and by reason of
the moystnesse, it maketh all things black
that it cometh nere, as moyst wood bur-
ning, is smoaky, and maketh things nere it
to be black and smoaky.

Why it
maketh
black.

Of the third kinde.

The third kinde is most like our com-
mon fire that wee have here on the
earth of grosse and earthly substance,
wherefoze it leaveth a print where it hath
been, or else consumeth it into ashes, if it be
such a body as will be burned with fire.

Grosse
lightning.

Of the maruailes of lightning,
and their causes.

Beside the wonderfull effects of light-
ning, that have been already remem-
bered, there be many other which hereafter
ensue, with the reason and causes unto them
belonging, as thus:

The mar-
vell of
lightning.

The nature of lightning is, to poy-
son beasts, that are stricken therewith, poysoneth
as though they had been bitten by a Ser-
pent. The cause of this is, that the mat-
ter of lightning is much infected with

Wim.

Brimstone, and other poysonous mettall-like substances, which will poyson the rather in lightning, because it is thinne, and giveth them passage into every part of the body.

Seneca.
Wine not
running,
the vessels
being broken.

It is notable, that Seneca writteth, how wine vessels of wood being burned with lightning, the wine would stand still, and not runne out: the reason hereof, is the swift alteration and change, whereby also all the clamminesse of the wine is drawne to the outwardmost part, and so keepeth in the wine, as in a skinne, that by the space of thre dayes it will not run. It will also poyson wine, insomuch that they which drinke thereof, shall either be madde, or dye of it: the cause hereof was set forth befoze.

Lightning
purgeth a
poysonous
beast.

A Snake
breedeth
so Worms

Lightning that striketh a poysonous beast, purgeth it from the poyson, in so much, that it causeth a Serpent or snake which it killeth, to breede wormes, which otherwise it would not doe, but being purged from the naturall poyson, by the swift pearcing of the lightning, nothing letteth, but that it may breede wormes, as all other corrupt flesh will doe.

If lightning strike one that sleepeth, Lightning
it openeth his eyes, and of one that wa- openeth
keth, it shutteth the eyes. The cause is his eyes
this, that it waketh him that sleepeth, that sleep-
and killeth him, before he can close his eth and
eyes againe. And him that waketh, it closeth
so amazeth, that he winketh, as he will doe his that
at any sudden chance: so hee dyeth, before waketh
he can open his eyes againe.

All living things turne their face Living
toward the stroke of the lightning, be- things
cause it is their nature, to turne their head turne their
if any thing come suddenly behind them. face to-
The rest that have their face toward it, ward light-
when it commeth, never turne before they ning.
be killed.

The reason why it killeth the child in
the mothers wombe, not hurting the mo-
ther, is the tendernes of the one, and the
strength of the other, when the lightning
is not vehement, otherwise both should die
together.

Sometime lightning burneth only Garments
the garments, shewes, or hayre of men, burnt, the
not hurting their bodies, and then the Ex- body un-
planation is nothing vehement. Some- hurt.
time it killeth a man, & there appeareth no
wound

wound without, neither any hurt within
no not so much as any signe of burning
for then the Exhalation, which being kin-
dled, is called lightning, is wonderful
subtill and thinne, so swiftly passing
thorow, that it leaveth no marke or token
behind it.

Lightning
causeth
blindness,
swelling
or Lepro-
sie.

They that behold the lightning, are
either made blinde, or their face swelleth,
or else become Lepers, for that fiery Ex-
halation, receyved into the pores of the
face and eyes, maketh their face to swell
and breake out into a Leprosie, and also
dypeth up the Chyistalline humour of the
eyes, so that consequently they must needs
be blind.

Eutropius.
Marcus
Tullius
Cicero.

Apulia:

Eutropius sheweth, that the same day
in which Marcus Tullius Cicero was
borne, a certaine Virgine of Rome riding
into Apulia, was stricken with light-
ning, so that all her garments being ta-
ken from her without any rending, she
lay starke naked, the lasing of her brest
being undone, and her hose garters unty-
ed, yea, her bracelets, collars, and rings
being all loosed from her. Likewise her
horse lay dead, with his bridle and girth
untied.

Th

The places of them that are burnt with lightning, are colder than the rest of their bodies, either because the greater heat dza. weth away the lesser, or else because that by the great violence, the vitall heat is quite extinguished in that place.

The wounds of lightning cold.

The Sea-Calf is never hurt with lightning : wherefore the Emperours Tents were wont to be covered with their skinnes.

Sea Calfe not hurt with lightning.

The Bay Trees, and Box Trees, are never, or seldome striken with lightning. The cause of these may be, the hardnesse of their skinne, which hath so few pores holes, that the Exhalation cannot enter into them.

Bayes and Box Trees seldome hurt with lightning.

The Eagle also among fowles, is not striken with lightning. Wherefore the Poets sayne, that the Eagle carrieth Jupiters armour, which is lightning. The reason may be the thicknesse and dypnesse of her feathers, which will not be kindled with so swift a fire.

The Eagle Jupiters harness-bearer.

Of storme Winder.

A Storme wind, is a thick Exhalation, violently moved out of a cloud, without inflammation or burning: the matter

Storme windes

D. Fulkes booke

ter of this fozme is all one with the matter of lightning, that hath bene spoken of namely, it is an Exhalation very hote and drie, and also grosse and thick, so that it will easily be set on fire: but then, it hath another name, and other effects.

The fozme or maner of the generation is such: When aboundance of that kinde of Exhalation is gathered together, within a cloud, which needs will have one way out or other, it breaketh the cloud, and causeth thunder, as it hath bene taught before: but if the matter be very thick, and the cloud somewhat thinne, then doth it not rend the cloud, but falling downe, beareth the cloud before it, and so is carried, as an arrow out of a bow. It doth alwayes goe before a great sudden shewre; for when the cloud is broken the water must needs fall downe. Also it is so grosse, and so thick, that it darkneth the ayre, and maketh all the lowest region of the ayre, to be in manner, as a darke smoaky cloud. It causeth tempest in the Sea, and wonderfull great danger to them that beare sayle, whom if it overtake, it bringeth to utter destruction.

So sudden is this kind, that it cannot be resisted

resisted with sudden helpe.

So violent it is, that feeble force cannot withstand it.

Finally, it is so troublesome with thunder, lightning, rayne, and blast, besides these, darknesse and cold, that it would make men, at so neere a pinch, to be at their wits end, if they were not accustomed to such tumultuous tempest.

Wherefore it were profitable, to declare the signes that goe befoze it, to the end men might beware of it.

But they are so common to other tempests, that either they are knowne well enough, or else being neuer so well known, in a seldome calamity, they would little be feared.

The Sea Ships subiect to moze danger, haue moze helpe, if it bee used in time: but no signes foreknowne, can profit the dweller of the land, to keepe his house from ruine, except it were to save his life from the fall of his mansion.

The sudden violence of this tempest to him, is moze seldome times, but moze incurable, when it commeth, than to the Marryner, who hath some ayde to

D. Fulkes booke

to look for, by his coming: the other, if he escape with his life, may comfort himselfe, that he was nere a great danger, and cast with himselfe to build up his house againe.

Of whirlwinds.

Whirle-
winds.

A Whirlewind, is a wind breaking out of a cloud, rowling or winding round about, overthrawing that which standeth neere it, and that which cometh befoze it, carrying it with him aloft in the ayze.

It differeth from a Storme wind in three points.

First in the matter which is lesse in quantity, and of thinner substance.

Secondly, in the moving, which is circular, winding about, whereas the Storme bloweth aslope and adelong. Also a whirlewinde, in the moving divideth not it selfe abzoade, and bloweth directly as the Storme doth.

And thirdly, in the manner of the generation: for a Storme doth alwayes come out of one cloud, but a whirlewind sometime is caused by meanes of two contrary windes that meete together.

In like manner, as wee see in the streets
of

of Cities, where the wind is beaten back from two walles, meeting in the middelt of the street, there is made a little whirlwind, which whisking round about, taketh up the dust, or strawes, and bloweth it about, after the very similitude of the great and fearefull whirlwind.

The reason of the going about, is this, that when the walles beat back the wind from them, which aboundeth in that place, and those windes, when they meete, by reason of equall force on both sides, can neither drive one the other back againe, nor yet passe thorow one the other, it must needs be, that they must both seeke a way on the side at once, and consequently, be carried round about, the one, as it were, pursuing the other, untill there be space enough in the ayre, that they may be parted asunder.

The matter of a whirlwind, is not much differing from the matter of storme and lightning, that is, an Exhalation hote and drie, breaking out of a cloud, in divers partes of it, which causeth the blowing about. Also it is caused, as it hath beene sayd, by two, or more windes, blowing from divers places,

C which

The troubles of
whirle-
winds.

which may be of particular causes, that have bene shewed befoze in the Chapter of windes. This tempest is noysome to man and beast, Sea and Land, things living, and life lacking: For it will take up both men and beasts, stones & clods of earth: which when it hath bozne a great way, will not be so courteous, as to set them downe againe, but negligently letteth them fall from a great height, or else violently throweth them downe to the earth.

It breaketh Trees, winding them about, and pulling them up by the rootes. It turneth about a Ship, and brutteth it in pæces, with other mischiefes besides.

Of fired whyrlewinds.

Fired
whirl-
winds.

Sometime a whirlewind is set on fire within the clond, & then breaking forth, flyeth round like a great cart-wheele, terrible to behold, burning and overthrowing all drie things that it cometh nere, as houses, woods, corne, grasse, and whatsoeuer else standeth in the way.

It differeth not from a whirlewind, saving that it is kindled and set on fire, so appearing, else the generation of both is called

called one.

Of Circles.

The Circle called Halon is a garland of divers colours that is seen about the Sunne, the Moone, or any other Starre, specially about Jupiter or Venus, for their great brightnesse. It is called of the Greeks a compassed plat, of the Latines, a crowne or garland.

Circles about the Sunne, the Moone, and other Starres, Jupiter & Venus Planets.

The matter wherein it is made, is a cloud of equall thicknes, or thinnesse, coming directly under the body of the Sunne, the Moone, or other Starres, into which, the light of the heavenly body is received, and so appeareth round, because the Starre is round: or as a stone cast into the water, maketh many round circles, dilating in breadth, untill the violence of the moving is ended; so is it in the ayre, the light beams piercing it, cause broad circles to be dilated, which appeare white, purple, black, red, green, blew, and other colours, according to the disposition of the clouds matter. The cause of such colours, is shewed before, in the peculiar treaty of colours.

Circles in the water.

The colours of circles.

This circle is oftner seene about the Moone, than about the Sunne, because

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the heate of the Sunne draweth the vapors too high, where it cannot be made. Also, because the night is a more quiet time than the day, from winde, it is more often in the night, than in the day. Seldome, about other Starres, because their light beames, are too weake often to pierce a cloud: yet oftner about small stars than the Sunne, because the light of the Sunne pierceth the cloud more forcibly, than that this Halon can many times be cause.

Circles
about a
candle.

Otherwhiles it is sene about a candle, which must be in a very thick and grosse ayre of such proportionate thickenesse, that it may receive the light as the cloud doth from the Starres, as in the smoaky places, or hote houses.

The signs
of these
circles.

This kinde of circle is sometimes like a Rainebow, saving that it is a whole circle, unlesse the Starre under which it is caused, be not all risen, or else the cloud, in which it is sene, be not all come under the Starre, or after it hath come under some part thereof, be dissolved from the rest.

Virgilius,
Aratus,
Poets.

These Circles be signes of tempests and windes, as witnesseth both Virgil, & Aratus.

The

The winde shall blow from that quarter, where the Circle first beginneth to breake. The cause whereof is this, that the Circle is broken by the winde that is aboue which is not yet come downe towards us, but by this effect aboue, wee may gather, both that it will come, and also from what quarter.

A great Circle about the Moone, be-
tokeneth great cold and frost to follow
after.

Signe of
frost.

But if it vanish away and bee dissol-
bed altogether, it is a signe of fayre wea-
ther.

Signe of
faire wea-
ther.

If it be broken in many partes, it sig-
nifieth tempest.

Signe of
tempest.

If it were altogether thicker and dar-
ker, it is a forewarning of rayne.

Signe of
rayne.

One alone, after Ptolomee, pure and
white, vanishing away by little and little,
is a token of faire weather.

Ptolome-
us. Signe
of faire
weather.

Two or thre at once, portendeth tem-
pest: if they be ruddy, they shew wind to
come; and toward snow, they seeme as if
were broken and rocky.

Being darke or dimme, they signifie
all these foresaid events, with more

Signe of
Snow.

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force and abundance: it is oftener caused in Autumne and Spring, than in Winter or Summer: the cause is the temperatenesse of the time.

Aristotle.
Antipho.

The cause why it appeareth sometime greater, and sometime lesser, is in the quality of the matter, which as it is grosse or thinne, will more or lesse bee dilated and stretched abroad, and also as some will have it, of the weakenesse of mens sight. Of which, Aristotle bringeth an example in one Antipho, which did alwayes see his owne image befoze him in the ayre, as in a glasse: which he affirmeth to have bene for the weakenesse of his sight beames, that could not pierce the ayre, so that they were reflected againe to himselfe.

And thus much for Halon, and the causes, signes, or tokens of it.

Of the Rainebow.

Raynebow

Possido-
nius.

The Raynebow, is the apparition of certaine colours in a cloud, opposite against the Sunne, in fashion of halfe a Circle. Possidonius said, it was the Sunnes looking glasse, wherein his image was represented, and that the blue colour, was the

the proper colour of the cloud; the red, of the Sunne; all the other colours of commixtion.

It differeth manifoldly from Halon: for the Rayne bow is alwayes opposite against the Sunne: but Halon is directly under it.

They differ not onely in place, but also in fashion: the Raynebow is but halfe a Circle: the Halon is a whole Circle.

Likewise they vary in colour: for the Raynebow is moze dimme, and of purple colour: the Halon, whiter and brighter.

Also, in continuance, for the Raynebow may continue longer than Halon.

The image of the Raynebow may bee seen on a wall, the Sunne striking thozow a six-pointed stone, called Iris, or any other Chzistall of the same fashion; also thozow some glasse windows.

A precious stone called Iris.

Halon is seen about Candles, in smoky places, as are baths and kitchens.

The manner of the generation of the Raynebow is such: There is opposite against the Sunne, a thick watery cloud, which is already resolved into

A simili-
tude.

de wy drops of rayne, as (for a grosse si-
militude) is seen on the potliode, when
the water in the vessell hath sodden, or
is very hote, the liode will be all full of
small drops of water, which come from
the water in the vessell, first, by heate
resolbed into smoake, after, when it can-
not goe at large, it is resolbed againe.
Wherefore upon such a cloud, the Sunne
beames striking, as upon a smooth glasse,
doe expresse the image of the Sunne un-
perfectly, for the great distance. Or else
the Sunne beames striking into a hollow
cloud, where they are refracted or broken,
and so come to the eyes of him that behol-
deth the Raynbow.

The simili-
tude of the
Raynbow.

The similitude thereof is scene, when
men sayle or row in boates, the Sunne
shineth upon the water, which casteth on
the vessels side, the colours and image of
the Raynbow.

Likewise, water in an urinall holden
against the Sunne, receibeth the light, and
sheweth colours on the wall.

Raynebow
of the Sun,
Raynbow
of the
Moone.

There be two kinds of Raynbowes,
one of the Sunne, another of the Moone;
the one by day, the other by night : the
Raynebow of the Sunne often, but of the
Moone

Moone very seldome, in so much that it can be but twice in fifty yeeres, and that when the Moone is in the East or West, full in perfect opposition.

It hath not bene many times seene since the writing of Histories, yet sometimes, and for the rarenesse, is taken for a great wonder. Yet is it in colour nothing so beautifull as the Sunnes, but for the most part white as milke: other diversities of colours are scant perceyved. When it appeareth, it is said to signifie tempest.

The time of the Raynbow is often after the poynt of Autumne, both for the placing of the Sun in competent lownesse, and also for abundance of matter, seldome or never is the Raynbow seene about the midst of Summer.

There may be many Raynbows at one time, yet commonly but one principall, of which the rest are but shadowes and images, the second, shadow of the first, the third, of the second, as appeares by placing of their colours.

It remayneth, to shew why it is but halfe a circle, or lesse, and never more, and why the whole cloud receyvethe not the same

same colours that the Rayne-bow hath. The cause of the first is, because the center or middle point of the Raynebow, that is Diametrally opposite to the center of the same, is alwayes either in the Horizon (that is, the circle cutting off our sight of Heaven by the earth) or under it. The cause why the whole cloud is not coloured, is, because that in the middest, the beames are strong, pearce theow, but on the edges where they are weaker, they are reflected or refracted.

Now for so much as **G D D** made the Raynebow a signe and Sacrament of the promise, some thinke it was never seene befoze the flood: their reason may be this, that the earth, after the first creation, was then so fruitfull, that it needed none, or very little rayne, so that such darke clouds were not often gathered, & fruitfull ground not so easily remitting his moysture, that then was fat and clammy, hard to be drawn up: so it might be, that there was no raynebow befoze, as we cannot finde that eber it rayned befoze. But whether it were or not, it is certaine, that then it became a Sacrament, whereas it was none befoze: which when we behold, it behobeth

us to remember the truth of God in all his promises, to his glozy and our comfort.

The milke way, called of some, the way to S. James, and Watling Streete.

The milke way is a white circle seene in a clere night, as it were in the firmament, passing by the signes of Sagittarius and Gemini. The white circle seen in the night.

The cause thereof is not agreed upon among Philosophers, whose opinions I thought best to report, before I come to the most probable causes.

First of all, Pythagoras is charged with a Poeticall fable, as though it had bene caused, by reason that the Sunne did once runne out of his pathway, and burned this part, whereof it looketh white. Pythagoras

Other, as Anaxagoras and Democritus, sayd, that it was the light of certaine Starres, shining by themselves, of their owne light, which in the absence of the Sun might be seene. But this opinion is also false, for the Starres have no light of themselves, but of the Sun: also if it were so, it should appeare about other Starres. Anaxagoras.
Democritus.

Democritus

Democrius is also reported to have sayd,
that it was nothing else but innumerable
little Starres, which with their confuse
light, caused that whitnesse: to this opinion,

Cardanus. Cardane seemeth to subscribe.

The Poets have foure fables of it : one
Phaeton. that Phaeton, which on a time guided the
Chariot of the Sonne, and wandring out
of the way, did burne that place, wherefoze
of Jupiter he was stricken downe with
lightning.

Ovid. The second, that it is the high street in
Meta. pr. Heaven that goeth streight to Jupiters pa-
lace, and both sides of it the common sort of
gods doe dwell.

Hebe. The third, that Hebe, one which was
Jupiters Cupbearer, on a time stumbled at
a starre, and shed the wine or milke that
was in the cup, which coloured that part
of Heaven to this day: wherefoze she was
put out of her office.

Apollo. The fourth that Apollo stood there
to fight against the Giants, which Ju-
piter made to appeare, for a perpetuall
memozy.

Theophras- Theophrastus, a Philosopher, affir-
tus. med, that it was the ioyning together, or
seame of the 2. halfe Globes, which made it
appeare

appeare more light in that place than in other.

Other said, it was the reflexion of the shining light of fire or starre light, as it is seene in a glasse, but then it should be moveable.

Diodorus affirmed, that it was Heavens fire, condensed or made thick, into a circle, and so became visible, whereas the rest, for the purenesse, clearnesse, and thinnesse, could not be seene. Diodorus.

Possidonius : whose mind to many seemeth very reasonable, said, it is the infusion of the heate of Starres, which therefore is in a Circle, contrary to the Zodiacke, (out of which the Sunne never wandzeth) because it might temper the whole compasse with vitall and libely heat. Although in my mind he hath rather expressed the small cause, than the effect. Possidonius.

Aristotles opinion is, that it should be the beames of a great Circle, which is caused by a cloud or Exhalation drawne up by those Starres, which he called Sporades. Aristotle.
Sporades.
 This opinion of Aristotles is mistaked of most men that have travayled in this science, and worthily : For if it were

whereof the nature of elements as Exhalations are, it would be at length consumed. But this circle never corrupteth, therefore it is not of Exhalations. Also it neither increaseth nor diminisheth, which is a plaine p^{ro}ofe, that it consisteth not of elementall matter, although Aristotle seem to make a double circle, one celestiall, another elementall.

The last opinion is, of them that say it is of the nature of heaben, thicker in substance, than other parts of Heaben be, having some likenesse to the substance of the Moone, which being lightned by the same, as all the Starres be, appeareth white. And this opinion I take to be most p^{ro}bable, because that sentence of Star-light seemeth not so reasonably, to be only in that place, and not elsewhere.

Possidonius.
Plinius.

The
breadth of
this circle.

The small cause of this milke-white circle, hath beene already touched in the opinion of Possidonius, whereunto also Plinius in the xviii. Book, and xxix. Chapter of his naturall History, agreeth, affirming, that it is very profitable for the generation and fruitfull increase of things that grow on the earth. The Mathematicians that have measured the breadth thereof, affirme, that

that toward the North, it passeth over the
eclipticall line of the ninth spheare, from the
xlii. degré of Gemini, unto the ii. degré
of Cancer, which is xiii. degrés and toward
the South, from the viii. degré of Sagita-
rius, to the xiii. degree of the same signe: and
because it is there divided into ii. branches
(as may easily be seen in a cleare night)
it reacheth from the xliiii. of Sagittarius, to
the ii. degree of Capricorne.

This circle, if it be of the nature of Hea-
ven, is unproperly placed among Meteors
or impressions : but because of Aristotles
mind, who will have it to be an impression
kindled, & their opinion, which think it pro-
ceedeth of the light of starres, it is not with-
out good cause in this place intreated of.

Of beames, or streames of light, ap-
pearing thorow a Cloud.

There is yet another kind of impression Beames or
streames.
caused by the beames of the Sunne,
stricken thzough a watery cloud, being of
unequall thinnesse, and is thinner in one
part than in another, so that it cannot
receybe the beames in any other forme,
than that they appeare direct or slope
downeward of divers colours, and the
same that are the colours of the Rayne-
bow,

D. Fulkes booke

bow, though not so evident, because the reflection is not so strong. They vary in colours: some are more purple or ruddy, when the cloud is thicker; some yellow & whitish, when the cloud is thinner, and so other colours are caused likewise, whereof you may read the proper cause in the colours of clouds and other like parts of this Treatise.

The common people call it the descending of the holy Ghost, or our Ladies Assumption, because these things are painted after such a sort. Other say that it is raine, striking down in another place, as though they could see the drops falling. And they are not altogether deceived, but in the time: for soon after, it will rayne, because this impression appeareth out of a watery cloud. They are called by divers names, as rods, wands, cords of Tents, unto which they are not much unlike, staves and little pillers, when they seem greater and thicker, many being ioyned together.

The Raynbow, the circles, and these light beames, are all of one maner of generation, in so much that if you divide the circle, it shall be a Raynbow, if you draw it streight in length, it maketh streames or beames.

beames. Wherein they agree, namely, in forme and matter, but they differ in outward forme, which we may call fashion, as the one is round, the other halfe round, and the third direct, straight or falling aslope. Also, they differ in place, about which they stand: for streames are only about the Sunne. Raynbowes about the Sunne often, and seldome about the Moone, but circles both about the Sunne and the Moone, and also about any other of all the Starres, yet rather, & oftner about bright Starres.

To make an end of these streames, they appeare diversly, after the fashion & place wherein the cloud hangeth, in respect of the Sunne: for sometime they are seene only in the edge of a cloud, all the breadth of that cloud: sometime thorow the mids of a cloud, being thinner there than in other parts, and then they are spread round about, like a tent or pavilion used in war. They are most commonly seene in such times, as there is great abundance of raime, which they, by their apparition, doe signifie not yet to be ended.

And thus much concerning direct light beames called roddees, &c.

¶

Of

Of many Sunnes.

Many
Sunnes
at once.
Alexander
the great.
Darius.

IT is strange and marvellous to behold the likelyhood of that, which Alexander the great, sending word to Darius, said to be impossible, that two Sunnes should rule the World. But oftentimes, men have seen, as they thought in the firmament, not only two Sunnes, but oftner three Sunnes, and many more in number, though not so often appearing. These, how wonderfull soever they appeare, proceede of a naturall cause, which we will endeavour to expresse. They are nothing else but Idols or Images of the Sunne, represented in an equall, smooth, and watry cloud placed on the side of the Sunne, and sometimes on both sides, into which the Sunne beams being received, as in a glasse expresse the likenesse of fashion and light that is in the Sunne, appearing as though there were many Sunnes, whereas indeed there is but one, and all the rest are images.

This thick and watry cloud, is not said to be under the Sunne, for then it would make the Circles, called crownes or garlands: it is not opposite to the Sunne, for then would it make the Rainbow: but it is
sayd

sayd to be on the side, where the image may be best represented. Also it may not be too farre off, for then the beames will be too feeble to be reflected: neither yet too nere; for if it so be, the Sun will disperse it: but in a competent & middle distance: for so representation of many Sunnes is caused.

They are most often seene in the morning and evening, about the rising or going down of the Sunne, seldome at noone time, or about the midst of the day, because the heat will soon dissolve them: yet have there bene some seene, which began in the morning, & continued all the day long, unto the evening. Sometimes there appeare many little Suns, like unto little Starres, which are caused after the same sort, as we do see a mans face to be exprest in all the pieces of a broken glasse. So when the cloud hath many separations, there appeare many Sunnes, on one side of the true Sun, sometimes great, & sometimes little, as the parts of the cloud separated, are in quantity.

Many smal
Sunnes,
like starres

Simili-
tude.

They doe naturally betoken tempest and rayne to follow, because they cannot appeare, but in a watry disposition of the ayre.

The signi-
fication of
many
Sunnes.

Also, if they appeare on the South-side of the Sunne, they signifie a greater tempest, than if they appeare on the North-side. The reason is alleadged, because the Southerne vapour is sooner resolved into water, than is the Northerne.

Galba,
Otho, and
Vitellius.

For a supernaturall signification, they have oftentimes bene noted, to have portended the contention of Princes for kingdomes: As not long before the contenti-
on of Galba, Otho, and Vitellius, for the Empire of Rome, there appeared three Sunnes. Also of late, toward the slaughter of Lewis King of Hungary, were seen three Sunnes, betokening three Princes that contended for the kingdome, namely Ferdinando since Emperour, Iohn Vayvode, and the great Turke.

Of many Moones.

Many
Moones.

Plinius.

After the treaty of many Sunnes, it were not hard for any man without farther instruction to know the naturall cause of many Moones: For they are likewise Images of the Moone, represented in an equall clond, which is watry, smooth, and polished, even like a glasse. Some call them (as Plinius sayth) night Sunnes, because they, toynd with the light of

of the true Moone, giue a great shining light, to drive away the shadow and darknesse of the night.

It were superfluous, to write more of their causes, or effects, which are all one with those, that haue bene declared of the Sunnes.

It may bee doubted, why the other Starres doe not likewise expresse their image, in watry clouds, and so the number of them, to our sight, should be multiplied. It may be answered, that their light or beames are too feeble and weake, to expresse any such similitude or likenesse in the watry clouds: For although they haue garlands, or circles about them that are caused in a vapor, that is under them, yet it is manifest, that this apparition hath not need of so strong a light, as is required to print the images of them in the clouds. Againe, the garlands are direct under, and therefore apter to receiue such apparition.

Why other
starres are
not so re-
presented.

It may be againe objected, that the Starres haue their image perfectly and sufficiently expressed in glasses here on the earth, yea, and at the day time, when their light is eyther none, or most feeble, and

Objection

weake, as we see it is used at Midsummer, to behold that great Starre called Sirius, in a glasse eben at noone dayes.

Sirius a
great
Starre seen
at noone in
Summer.

Also we see every night, the image of the Starres in calme and quiet standing waters: then, what should let, but that their images might also be expresse in watry cloudes?

An answer.

Hereto may be answered, that the let is in the cloud, which is neither so hard as is the glasse, nor yet so continuall as the water, but consisteth of innumerable small drops, so that except the light of the Starres were stronger, it can in them expresse no uniforme images of them, as it doth in glasses, and in the water. Notwithstanding, in writers of wonders, we read some such like thing sometime to have chanced.

There hath bene often scene many Sunnes in the day time, and after the Sun setting: at the rising of the full Moone, there have appeared many Moones, which was by this meanes, that the same cloud, that receiued the Sunne beames in the morning, tarried in the same place, and at the Moones rising, was ready also to receive her image.

Of

Of wonderfull apparitions.

Wonder-
full appa-
ritions.

VVe will close this booke, with a
bryefe declaration of the natu-
rall causes of many things that are seen in
the ayre, very wonderfull and strange to be-
hold, which in these latter yeres have bin
often seen and beheld, to the great admira-
tion of all men, not without the singular
providence of God, to forewarne us of ma-
ny dangers that hang over us, in these most
perillous times.

The apparitions of which, as it is most
wonderfull, so the searching of the cause,
to us is most hard and difficult, a great
deale the rather, because no man hath hi-
therto enterprised (to my knowledge) to
seeke out any cause of them, but all men
have taken them as immediate miracles,
without any naturall meane or cause to
procure them.

And I truly doe acknowledge, that
they are sent of God, as wonderfull signes,
to declare his power, & move us to amend-
ment of life, indeed miraculous, but not
yet so, that they want a naturall cause: for
if they be well weighed & considered, it is
not hard to find, that they differ much from
such miracles as are recorded in the Scrip-
ture,

ture, and admitted of diuines. So that as
 I abhorre the opinion of Epicures, to
 thinke that such things come by chance,
 but rather by the determined purpose of
 Gods providence: so I consent not with
 them, that suppose, when any thing is
 deriued from any naturall cause, God
 the chiefe and best cause of all things is ex-
 cluded.

Some of these wonderfull apparitions
 consist of circles and Raynbowes, of diuers
 fashions and placings, as one within ano-
 ther, the edge of one touching another, one
 diuising or going thorow another, with
 like placing of small circles about great
 circles, or parts of small circles; some with
 the ends upward, some downward, some
 aside, and some a crosse, but all for the most
 part in unifoyme order constituted or pla-
 ced for the order of them, pleasant to be-
 hold, but for the strangenesse, somewhat
 fearefull. Such a like apparition is made
 with the Sunnes or Moones images, toy-
 ned unto these circles, set also in good and
 unifoyme order.

The cause of these is the meeting toge-
 ther of all those seuerall causes that make
 the circles, Raynbowes, streames, and ima-
 ges,

ges of the Sunne or Moone, which ioyned
all together, make the wonderfull sight of
strange Raynbowes, positions of circles,
crosses, and diuers lights, which pertain
to the knowledge of Optic and Catrop-
tic, that teach how by diuers refractions &
reflections of beames, such visions are
caused. So that he which will know how
they are generated, must returne into the
seuerall treatises of Raynbowes, circles,
Arcues, and images of the Sun or Moone:
and if in them he find not knowledge suf-
ficient to instruct him, I must send him to
the demonstrations of perspective, where
he shall want nothing.

Optice.
Catro-
ptice.

Another sort of them, no lesse often
beheld within these few yeeres than the
former, but a great deale more strange
and wonderfull to looke upon, are the
sights of armies fighting in the Ayre,
of Castles, Cities, and Townes, with
whole Countries, habing in them Hills,
Valleys, Rivers, Woods, also Beasts, men,
and Fowles. Monsters of which there are
no such kindes on the earth, and finally,
all manner of things and actions that are
on the earth, as burials, processions,
iudgements, combates, men, women,
children,

childzen, hozles, crownes, armes of certaine noble men, and countries, weapons of all soztes, sometimes starres, Angels as they are painted with the image of Christ crucified, besseging of castles and townes, many things and gestures done by men or beasts, the very similitude of persons knowne to the beholders, as of late, was scene the very Image of the Emperour Charles, in so much that they which beheld it, put off their cappes, thinking verily it had beene he, and of Iohn Frederick, Prince Elector of Saxony, who that time was prisoner with the Emperour. Also the image of small crosses, which hath beene not only in the ayre, but also on the earth, on mens apparell, on dishes, platters, pots, and all other things, so that the Iewes have been full angry, that they could neither wash, nor rub them out of their apparell. In Germany also fires and many such things, as it were long stozies seen in the ayre.

All these wonderfull apparitions may be caused two manner of wayes: the one artificially, the other naturally. Artificially, by certaine glasses, and instruments made according to a secret part of that know-

knowledge, which is called Catoptrice, Catoptri-
 and so peradventure some of them have been
 bene caused, but the most part (doubtlesse)
 naturally, when the disposition of the ayre
 hath bene such, that it hath receyved the
 image of many things placed and done
 on the earth. And because it is apt to re-
 ceive divers images, as well in one place
 as in another, these monstrous formes
 and strange actions, or stozies, proceed, of
 the ioyning of divers formes and actions,
 as if two Histories were confusedly payn-
 ted in one, the whole picture would bee
 strange: or (as the Poet saith) if a Payn-
 ter, to a mans head, should set a horses
 neck, and after, divers feathers. Some-
 times also, one image is multiplied in the
 ayre, into many or infinite, as are letters
 and crosses, which fill all the ayre, even be-
 neath: And the light of the Sun, receyved
 into little parts maketh to appeare, as it
 were many small Starrs.

Horatius.

Let this suffice, concerning these won-
 derfull apparitions: once againe admo-
 nishing the Reader, though I have en-
 terprised to declare these by naturall rea-
 son, yet verily believing, that not so
 much as one Sparrow falleth to the
 ground,

ground, without Gods pꝛovidence, I doe also acknowledge Gods pꝛovidence bringeth these to passe, to such end as befoze I have shewed, using these causes, as meanes and instruments to doe them.

The fourth Booke, of watry impressions.



Those be watry impressions, that consist most of water. In the treatie of them, are wont to be handled these impressions, namely cloudes, rayne, dew, hoare frost, haille, snow, springs, rivers, and the great Sea it selfe.

Of Cloudes.

Clouds.

A Cloud is a vapor cold and moyſt, adꝛaine out of the earth, or waters, by the heate of the Sunne, into the middle region of the ayze, where, by cold it is so knit together that it hangeth, untill either the waight, or some resolution, cause it to fall downe.

The place wherein the cloudes doe hang, is sayd to be in the middle region of the ayze, because men see it is necessarie that there should be a cold, which should

Should make those vapors so grosse and
thick, which for the most part are drawn
so thinne from the earth, that they are
invisible, as the ayre is. And although
they are knowne oftentimes, as Aristotle
witnesseth, to be in the lowest region of
the ayre, neere to the earth, in so much
that sometimes they fall downe to the
earth with great noyse, to the great feare
of men, and no lesse losse and danger; Yet
may it be reasonably thought, that these
clouds were generated in the middle regi-
on of the aire, farre distant from the earth,
which by their heabinesse doe by little
and little sinke downe lower into the low-
est region, and sometimes also fall downe
to the earth.

The common opinion is, that they
goe not higher than nine myle, which,
because it leaneth to no reason, is uncer-
taine.

Albertus Magnus, whose reason also is
to be doubted of, affirmeth, that the clouds
doe scarce exceed thre miles in height,
when they are highest.

And some let not to say, that oftentimes
they ascend not past the halfe of one mile
in height.

Againe,

D. Fulkes booke

Againe, other pretending to finde out the truth, by Geometrical demonstration make it above fifty mile to the place where the generation of clouds is.

How these men take the distance from the earth, it is uncertaine: whether that they assigne the least distance, and meane it from the highest part of the earth, as are hill tops, or from the common playne.

Againe, whether they that assigne the highest distance to be from the lowest valleys of the earth, or from the hill tops.

The reason before shewed, moveth me to thinke that the most usuall and common generation, I meane, the condensation or making thick of these thinne vapors, into clouds, is in the middle region of the ayre. But for the distance of the clouds, when they be generated, I thinke, they be sometime nine mile, sometime three mile, sometime halfe a mile, and sometime lesse than a quarter of a mile from the earth.

Mists.

Of Mists.

There be two kindes of Mists; the one ascending, the other descending.

That which ascendeth, goeth up out of the water, or the earth, as smoke, but doth not

not commonly, spread ober all other parts: it is seen in rivers and moyst places.

The other mist that goeth down toward the earth, is when any vapor is lifted up into the ayre, by the heat of the Sun, which not being strong enough to draw it so high, that the cold may knit it, suffereth it, after it is a little made thick, to fall down againe; so it filleth all the ayre with the grosse vapours, and is called, *Mists*, being usually a signe of faire weather.

Of empty cloudes.

There be certaine cloudes that are empty, and send no rayne; they come of two sorts. One sort are the remnants of a cloud that hath rained, which cannot be converted into water, for their drynesse.

Another sort is of them that are drawn up out of wet and dry places, and be rather Exhalations than vapors: that is, they be dry, hote, and light, so that it were hard for them to be turned into rayne: they looke white, like flocks of wolle, when the light striketh into them.

There be also empty cloudes, which, when the winds have dispersed abroad any cloud, are scattered ober all the skie: but these cloudes, though for a time they be empty, yet because

Empty
clouds.

D. Fulkes booke

because they consist of such a substance as
is watry, they may be, and are oftentimes
gathered together, and give plentiful
rayne.

Of the co-
lours of
clouds.

Of the colours of cloudes, we have
spoken in the second booke of fiery Mete-
ors, where those colours and the causes of
them are described, which seeme to be
fiery, or may be thought to be inflammati-
ons or burnings, as to be redde, fiery and
yellowish.

But besides those, there be white, black,
blue, and Greene.

White clouds be thinne, and not very
watry, so that the light receiued in them,
maketh them to appeare white.

Black clouds be full of thick, grosse, and
earthly matter, that maketh them looke so
darke.

Blue clouds be full of thick drosse,
and earthly, as the black: so the light
receiued in them, maketh them to seeme
blue.

Greene clouds are altogether watry
resolved into water, which receiuing into
them the light, appeare greene, as water
doth in a great vessell, or in the Sea and
Rivers.

Of

Of Raine.

After the generation of clouds is well Raine.
knowne, it shall not be hard to learn, from whence the Raine cometh.

For after the matter of the cloud being drawne up, and by cold made thick (as is said before) heate following, which is most commonly of the Southerne winde, or any other wind of hot temper, doeth resolbe it againe into water, and so it falleth in drops, to gibe increase of fruit to the earth, and move men to gibe thanks to God.

There be small Showres, of small drops, and there be great Showres, of great drops.

The Showres with small drops, proceed eyther of the small heate that resolbeth the clouds: or else of the great distance of the clouds from the earth.

The Showres with great drops contrariwise doe come of great heate, resolbing or melting the cloud, or else of small distance from the earth. Whereof we see a plaine experiment, when water is powzed forth from an high place, the droppes are small, but if it be not from height, it will either have no droppes, or very great.

D. Fulkes booke

The cause why raine falleth in round drops, is both for that the parts desire the same forme that the whole hath, which is round; and also, that so it is best preserved against all contrary qualities: like as we see water powdered upon dry or greasy things to gather it selfe into roundels, to avoid the contrariety of heate and drynesse.

Why raine water is not salt.

It is not to be omitted, that raine water, although a great part of it be drawne out of the sea, yet most commonly it is sweet and not salt.

The cause is, because it is drawne up in such small vapors, and that salt part is consumed by the heat of the Sunne.

The raine water doubtlesse doth moze encrease and cherish things growing on the earth, than any other water wherewith they may be watered, because the raine water retaineth much of the Sunnes heat in it, that is no small comfort to all growing plants. The water that commeth from Heaben, in raine, will sooner come to putrefaction, or stinking, than any other, because it hath beene made very subtil by heate, and also for that it is mixed with so many earthly and corruptible substances.

Rayne

Rayne water, that falleth in the summer. Avicens
 by Avicens iudgement, is moze wholesome
 than other water, because it is not so cold
 and moyst as other waters be, but hotter
 and lighter.

Sometime there is salt rayne, when Salt rayne.
 some Exhalation which is hot and dry, is
 commixed with the vapour wherof the
 rayne consisteth.

Sometime it is bitter, when some Bitter-
rayne.
 burnt earthly moysture is mixed with it.

This rayne is both unwholesome, and
 also unfruitfull. In these countreys, there
 is great store and plenty of rayne, because
 the Sunne is of such temperate heate, that
 it gathereth many vapours, and by im-
 moderate heate doeth not consume them.
 But in the East parts, in some hot Coun-
 treys, it neber or seldome is seene to rayne,
 as in Egypt and Syria, but in stead of
 rayne, Egypt hath the River Nilus, whose The river
Nilus.
 overflowings doe marvellously fatten
 the earth. In Syria and other like Coun-
 treys, they have moze plentiful dew, than
 we have, which doth likewise make their
 earth exceeding fruitfull.

Seneca testifieth, that the rayne soketh no
 deeper into the earth, than ten fote deepe. Seneca.

D. Fulkes booke

Of the signes of rayne.

Signes of
rayne.

First, if the skie be red in the morning, it is a token of rayne, because those vapours which cause the rednesse, will be shortly resolved into rayne.

If a darke cloud be at the sunne rising, in which the Sunne some after is hidde, it will dissolve it, and rayne will follow. If then appeare a cloud, and after, vapours are seene to ascend up to it, that betokeneth rayne.

If the Sunne or Moone looke pale, looke for rayne.

If the Sunne in the East seeme greater than commonly he appeareth, it is a signe of many vapours which will bring rayne.

If the Sunne be seene very rarely, or few Starres appeare in the night, it betokeneth rayne.

The often changing of the winds, also sheweth tempest.

The most sure and certayne signe of raine, is the Southern wind, which with his warmenesse, alwayes resolveth the clouds into rayne.

When there is no dew at such times, as by nature of the time there should be,
raine

rayne followeth : for the matter of the dew is turned into the matter of watry Clouds.

If in the West, about the Sunne setting, there appeare a black cloud, it will rayne that night, because that cloud shall want heate, to disperse it.

When much dust is rayned up, & when the woods make a great noyse, some tempest is towards.

Hard Stones will be moyst, and sweate against rayne : lamps & candles by sparkling, frogs crying, trees breaking, leaves falling, and dust clattering, foze warne us of a tempest.

Fleas, flies & gnats, bite soze toward a tempest, kine feede greedily, birds seeke their bitailes moze busily : for in the grosse ayze disposed to rayne, their stomacks are hotter, and they moze hungry. But these kind of signes pertayne not so properly to Meteorologie, as to Mariners and husbandry, which have a great many moze than these. And Virgill in his first booke of Georgikes, hath a great number, for them that list to learne. Wherefoze let these hitherto suffice.

D. Fulkes booke

Of monstrous or prodigious rayne.

Of Mon-
strous
rayne.

Wormes &
Frogges.

Fishes:

Milke.

Hitherto we have made mention only of naturall rayne, & that which is common, which no man doth marvell at. But there is some time such rayne, that woorthily may be wondred at: as when it rayneth wormes, frogges, fishes, blood, milke, flesh, stones, wheat, iron, wolle, brick, and quicksilver. For histories make mention, that at divers times, it hath rayned such things, whose naturall cause, for the most part, we will goe about to expresse, notwithstanding, accounting them among such wonders, as God sendeth to be considered for such ends, as we have before declared. Wormes and Frogges may thus be generated: when fat Exhalations are drawn up into the ayre, by a temperature of hote and moyst, such vermine may be generated in the ayre, as they are on the earth, without copulation of male and female. Or else, that with the Exhalations and vapors, their seed and egges are drawn up, which being in the clouds brought to forme, fall down among the rayne.

Likewise the spawn of fishes, being drawne up, maketh fishes to rayne out of the clouds. The vehement heate of the Sunne,

Sunne, in Summer, and specially in hote Countries, draweth milke out of the paps of beasts and cattell, which being carryed up in vapours, and resolved againe into milke falleth downe like rayne.

After the same manner, the Sunne also Blood. from places where bloud hath beene spilt, draweth up great quantity of blood, and so it raineth blood.

It rayneth flesh, when great quantity of Flesh. blood being drawn up, it is clotted together, and seemeth to be flesh.

Avicen sayth, that a whole calfe fell Avicen. out of the ayze: and some would make it seeme credible, that of vapours and Exhalations, with the power of heavenly bodies concurring, a calfe might be made in the clouds. But I had rather thinke, that this calfe was taken up in some vortice of whirlwind, and so let fall againe, than agree to so monstrous a generation.

It is a great deale more reasonable, Stones. that Stones of earthly matter gathered in clouds, should be generated as we have said befoze of the thunderbolt. Yet some men thinke, that wind in caves of the earth breaking upward violently, carrieth befoze it, earth & Stones into y^e ayze, which cannot

Brick.

Blood

Wheat.

Wheat

Wheat

Wool.

Quick-
silver.

long abide, but fall downe, and are counted among prodigious raine. Exhalations that be earthy and drawn out of clay, have much grosse substance in them, which gathered together, and by great heat burned in the clouds, make brick, which is no great marvell.

He that hath scene an egges shell full of dew drawn up by the Sunne into the ayre, in a May morning, will not thinke it incredible, that wheat and other graine should be drawn up in much hotter countries than ours is, much rather the meale of floure which is lighter.

A certaine moistnesse, like wooll, as is upon Quinces, willowes, and other young fruits and trees, is drawn up of the Sunne among the vapours and Exhalations, which being clotted together, falleth downe like locks of wooll.

Quicksilver, all men know with small heate will be resolved into most thin vapours, whereof when quantity is drawn up, it falleth downe againe: As it is read, that once at Rome it rayned Quicksilver, wherewith the brazen money being rubbed it looked like silver.

Titus Livius maketh mention, that it rayned

rayned chalke, wherof the cause cannot Chalke.
be hid to them, that read holo Stone and T.Livius
bzyck come in the ayze.

Iron hath also rained out of the clouds, Iron
and sundry times, as hystoris witnesse,
whereof this hath bin the cause: The ge-
nerall matter of all mettalles, which is
quicksilver and bzimstone, with the speci-
all matter of mixtion, that maketh Iron,
were all drawne up together, and there
concocted into the mettall: so came the
strangeraine of Iron.

Avicen saith, he saw a peece of Iron Avicen.
that fell out of the cloudes, that waighed
about an hundred pound waight, whereof
very good swozds were afterwards made.

Of Dew.

Dew is that vapour, which in Spring Dew.
and Autumne, is drawne up by the
Sunne in the day time, which, because it
is not carried into the middle region of
the ayze, abiding in the lower region, by
cold of the night, is condensed into
water, and falleth downe in very small
droppes.

There is common dew, and sweet dew.

One

Manna.

One kinde of the sweet dewes is called Manna, being white like Sugar, which is made of thick and clammy vapors, which maketh it so to fall thick and white. It falleth only in the East parts. As for that Manna, which God rained to the Israelites, it was altogether miraculous.

Plinius.
Arabia.

In Arabia (as Plinius writeth) is a very precious kinde of dew, that is called Ladanium, which falling upon the herbe Cusys, & mixed with the iuice of that herbe which Goates doe eate, is gathered of Goates haire, and kept for a treasure.

Ladanum.
Cusys.

There is another kind of sweet dewes, that falleth in England, called the Mel-dewes, which is as sweet as honey, being of such substance as honey is: it is drawne out of sweet herbes and flowers.

Bitter dew

There is also a bitter kind of dew, that falleth upon herbes, and lyeth on them like branne or meale, namely, because it is of an earthy Exhalation, and so remaineth, when the moisture is drawne away: this dew killeth herbes.

The common dew drunke of cattell, doth esteem them, because the matter is full of viscosity, bringing them to a stop.

There be three things that hinder dew from

from falling, that is, great heate, great cold, and wind: for dew falleth in the most temperate calme time.

Of hoare Frost.

Hoare frost, or white frost is nothing Hoare frost.
 else, but dew congealed by over much cold. The South and East wind doe cause dew, but the North and Northern winds doe frieze the vapours; and so it becommeth hoare frost: which, if that excessive cold had not bin, should have turned into dew.

The dew and the hoare frost agree in three things, namely, in matter, in quality of time, and place of their generation. In matter they agree; for they are both generated of a subtill and thinne vapour, and also small in quantity.

In quality of time they consent, for both are made in a quiet and calme time: for if there were great wind, it would drive away the matter, and so could there be no generation.

Thirdly, they are both generated in the lowest region of the ayre, for (as Aristotle Aristotle. affirmeth) upon high hills, there is neyther dew nor hoare frost.

They differ also in three things. For
 the

the hoare frost is congealed, before it be turned into water; so is not the dew.

Secondly, the dew is generated in temperate weather, the white frost in cold weather.

Last of all, hote windes, as the South and East, doe cause dew, but cold winds, as the North and West, doe cause hoare frost.

Hoare frost doth often stinke, because of the stinking matter whereof it consisteth, which is drawne out of lakes and other muddy and stinking places.

Of Hayle.

Hayle.

Hayle is a hote vapour in the middle region of the ayze, by the cold of that region, made thicke into a cloud, which falling downe to the sudden cold of the lowest region, is congealed into Ice.

There be so many kindes of hayle, as there be of rayne. The fashion of hayle is sometime round, which is a token, that it was generated in the middle region of the ayze, or very nere it: for falling from high, the corners are worne away.

When the hayle stones are square, or thre cornerd, the hayle was generated nere the earth.

Often:

Often times there is heard a great sound in the Clouds, as it were of thunder, before haile, or of an army fighting, &c. The cause is, that vapours of contrary qualities, being inclosed in the Cloud, do strive to breake out, and make a noyse, even as cold water doeth, being put into a seething pot.

In spring and harvest time is often haile, seldome in Summer and Winter. In winter there want hote vapours; in Summer, the lowest region is too hote, to congeale the rayne falling downe. In spring and Autumne, there want neyther hote vapours, to resist the cold, nor sufficient cold to harden the drops of that hote tholwe of rayne.

The haile stones are sometimes greater, and sometimes lesser; greater, with greater cold; and lesser, with lesser cold.

There is seldome haile in the night, for want of hote vapours to be drawn up.

Somettime haile and rayne fall together, when the latter end of the Cloud, for want of cold in the lowest region, is not congealed.

Haile-stones are not so cleare, as Ice, because they are made of grosse and earthy vapours,

vapours, Ice is congealed of cleare water.
 Hayle is sooner resolbed into water,
 than Snow, because it is of a moze sudden
 and swift generation.

Of Snow.

Snow.

Snow is a cloud congealed by great cold,
 before it be perfectly resolbed from va-
 pours into water.

Snow is white, not of the proper colour,
 but by receiuing the light into it, in so ma-
 ny small parts ; as in some, or the white
 of an egge beaten.

Snow is often upon high hills, and ly-
 eth long there, because their tops are cold,
 as they be neere to the middle region of the
 ayze : for oftentimes it rayneth in the val-
 ley, when it snoweth on the hills.

Originall
 of Christ-
 all.

Snow melting on the high hills, and af-
 ter frozen againe, becommeth so hard, that
 it is a stone, and is called Christall.

Other matters of Snow, because they
 are common with Rayne, are needlesse to
 be spoken of. To be short, sleet is generated
 even as Snow, but of lesse cold, or else be-
 ginneth to melt in the falling.

Snow causeth things growing to bee
 fruitfull, and encrease, because the cold
 doth beeth

driveth heate unto the rootes, and so cheri-
sheth the plants.

Of Springs and Rivers.

The generation of Springs is in the
bowels of the earth, therefore some-
thing must be said of the body of the earth.

Springs.

The earth, though it be solid and masse,
yet hath it many hollow gutters & veines,
in which is alwayes ayre to avoid empty-
nesse: for the ignorant in Philosophy must
be admonished, that all things are full, no-
thing is empty, for nature abhorreth emp-
tinesse, so that where nothing else is, there

Nothing is
empty.

is ayre and vapours, which by cold, as it
hath often been said, will be resolved into
drops, as we see experience in marble pil-
lers & such like hard stones, toward raine.
This ayre & vapours therefore, being tur-
ned into drops of water, these drops sweat
out of the earth, and finde some issue at the
length, where many being gathered toge-
ther, make great abundance of water,
which is called a fountaine or spring. The
cause why such springs doe run continual-
ly, is because that ayre can never want in
these veines, which by cold will alwayes be
turned

turned into water, so that as fast as the water runneth forth, so fast is aye againe received into the place, whereby it commeth to passe, that so many springs are perpetual, and neber dzyed: but if any be dzyed up, it is in a hot Summer, and such springs also they be, whose generation is not deepe in the earth, and therefore the vapors may be made dzy, and the earth warme, so the spring may faile.

There be foure kinds of springs, fountaines, brookes, rivers, and lakes.

Of Fountaines.

Fountain.

Fountaines bee small springs, which serue for wells and conduits, when there is but one place, where the water is generated, and that is not very abundant, eyther because it is of small compasse, or small veines, and not many.

Of Brookes.

Brookes.

Brookes, broyes or fordes, bee small streames of water, that run in a channell, like a river. They are caused when either the spring occupieth a great compasse, or else two or three small springs meet together in one channell.

Of Rivers.

Rivers.

Rivers are caused by the meeting together,

gether, not only of many springs, but also of many brookes and fozds, which being receiued in diuers places as they passe, are at the length caried into the broad Sea for the most part. Howbeit some Riuers as swallowed up into the Earth, which perchance run into the Sea, by some secret and unknowne channels: some Riuers there be, that hide their heads under the Earth, and in another place, far off, breake out againe. They write also, that some Riuers being swallowed up of the Earth, in one Iland doe run under the bottome of the earth and Sea, and breake forth in another Iland. There be also many great Riuers, that run under the Earth in great Caves, which neuer breake forth. Aristotle sheweth of ponds and lakes, that be under the Earth. And Seneca speaketh of a pond, that was found by such as digged in the Earth, with fishes in it, and they that did eat of them, dyed. As Bees that be found in darke places, as Wells that haue bene dammed up, &c. are poyson.

Of Lakes.

Lakes.

Lakes are made by the meeting together of many Riuers, brookes and springs into one deepe valley: whereof, some are so great,

D. Fulkes booke

great, that they have the name of seas, as the great lake called Hircane, or Caspian Sea. These lakes sometimes unlade themselves into the Sea, by small rivers, sometimes by passages under the earth.

The cause of the swiftnesse of Rivers, is double: for they are swift, either for the great abundance of waters, or else because they run downe from an hilly place, as the River Rhene falleth down from the top of wonderfull high hills.

Of hot Bathes.

Hot
Baths.

Some waters, that are generated & flow out of veins of brimstone, are sensibly warme, and some very hot, because they run out of hot places. These waters being also drying by nature, are wholesome for many infirmities, specially breaking forth of scabs, &c. Such are the baths in the West country, and S. Anne of Buck- stones well in the North part of England, and many other elsewhere.

Of the divers tastes that are perceived in welles.

Tastes of
waters.

For a generall reason the waters receive their taste of that kind of earth, thozow
which

which they runne, as thozow a strayer.
Some salt, that run thozow salt veines of
the earth: some sweet, that be well stray-
ned, or run thozow such minerals as be of
sweet taste: some bitter, that flow out of
such earth, as is bitter by aduersion or o-
therwise.

Some lowze or sharpe, like vinegar,
which run thozow veines of Allome, co-
perus, or such minerals. Aristotle wryteth
of a well in Sicily, whose water the Inha-
bitants used for vinegar.

Aristotle.
Well wa-
terused for
Vineger.
Bohemia.

In Bohemia neere to the city called Bi-
len, is a well that the people use to drinke of
in the morning, in stead of burnt wine.

And in diuers places of Germany be
springs, that taste of such sharpenesse.

Some have the taste of wine, as in
Paphlagonia is a well, that maketh men
drunke, which drinke thereof: which is, be-
cause that water receiveth the fume of
brimstone, and other minerals, thozow
which it runneth, and so filleth the braine as
wine doth.

Paphla-
gonia.

A recitall of such rivers and springs, as have
marvellous effects, whereof no naturall
cause can bee assigned by most men, al-
though some reason in a few may be found.

Marveylus
waters

Clitumnus

Propert.

Boetia.

Melas.

Seneca.

Libia.

Seneca.

Clitumnus, which maketh Oren that
drinke of it, white, is a Riber or spring
in Italy, Propert. lib. 3. This may be the
quality of the water, very flagmatick. In
Boetia is a river called Melas, that maketh
sheep black, if they drinke thereof.

Seneca speaketh of a Riber that maketh
red hayres. These two with the first, may
have some reason, that the quality of the
water may alter complexion, and so the
colour of hayres may be changed, as we see
in certaine diseases.

In Libia is a spring, that at the Sunne
rising and setting, is warme; at mid day
cold, and at mid night, very hote. This
may be, by the same reason, that wel wa-
ter is colder in Summer, than it is in
winter. Seneca writeth, that there bee
Rivers, whose waters are poyson: this
may be naturally, the water running thro-
w low poysonous minerals, taking much
fume of them. Other Wells that make wood
and all things else that be cast into them,
stones, such welles be in England, the cause
is great cold.

Another Well maketh men madde that
drinke thereof. This also may have as
good reason, as that which maketh men
drunke:

drunke: As also that Well, which maketh men forgetfull by obstruction of the brain.

The same Seneca speaketh of a Water, that being drunke, proboketh unto lust and lechery. And why may not that quality be in a Water, which is mixed with diuers minerals and kinds of earth, which is in herbes, rootes, fruits and liquours?

S. Augustine speaketh of a well in Egypt, in which burning torches are quenched, & being before quenched, are lighted. S. August.

Among the Garamants is a Well, so cold in the day, that no man can abide to drinke of it: in the night so hot, that none can abide to feele it. Garamants.

It is incredible, that is written of a well in Sicilia, whereof if thesbes did drinke, they were made blind. Sicilia.

In Idumea was a Well, that one quarter of a yeere was troubled and muddy, the next quarter bloody, the third greene, and the fourth, cleare. Idumea.

Seneca writeth of another Well, that was six houres full and running ober, and six houres decreasing and empty: perchance, because it ebbed and flowed with the Sea, or some great Riber that was nere it.

D. Fulkes booke

Anthracius

In the hill Anthracius, is sayd to be a well, which when it is full, signifieth a fruitfull yere, when it is scarce and empty, a barren and deare yere. The sufficiency of moisture maketh fertility, as the want causeth the contrary.

Hungaria.

Men say, there is a river in Hungary, in which Iron is turned into Copper: which may well be, seeing inke, in which is but small copper, and artificially mixed, of Iron, doth counterfeit copper in colour In this streame may be much copper, and that is naturally mixed.

Seneca.

Theophrastus.

Both Seneca and Theophrastus witness, that waters there be, which within a certaine space, being drunke of sheepe, (as Seneca sayth) or of birds (as Theophrastus will have it) changeth their colours from black to white, and from white to black.

Vitruvius.

Arcadia.

Nonacrinis.

Vitruvius writeth, that in Arcadia is a water called Nonacrinis, which no vessel of Silber, Brasse, or Iron, can hold, but it breaketh in peeces, and nothing, but a Gules hose, will hold it and containe it.

Illyria.

In Illyria, garments that are holden over a most cold Well, are kindled and
set

set on fire.

In the Ile of Andros, where the Temple of Bacchus stood, is a Well, that the first day of January flowed wine. Andros.
Bacchus.

Isidore saith, there is a Well in Italy that healeth the wounds of the eyes. Isidorus.

In the Ile of Chios is a Well, that maketh men dull-witted, that drinke thereof. Chios.

There is another, that causeth men to abhorre lust.

Lechnus, a Spring of Arcadia, is good against abortions. Lechnus.

In Sicilia are two Springs, of which one maketh a woman fruitfull, and the other barren. Sicilia.

In Sardinia be hote Welles, that heale soze eyes. Sardinia.

In an Ile of Pontus, the Riber Astaros overfloweth the fields, in which what soeuer sheepe be fedde, doe alwayes give black milke. Pontus,
Astaros.

In Aethiopia is a Lake, whose water is like oyle. Aethiopia.

Also, many Springs of oyle have broken forth of the earth, which commeth of the viscosity or fatnesse of the same earth.

The Lake Clitory, in Italy, maketh men that drinke of it, to abhorre wine. Clitorius.

Pentafium
Solinus.

The lake Pentafium (as Solinus sayth)
is deadly to Serpents, & wholsom to Men.

Syria.

Seneca writeth of certaine Lakes that
will beare men, which cannot swimme.
And that in Syria is a lake, in which bzicks
doe swimme, and no heaby thing will sinke.

Rhenus.

It is said, that the Riber Rhene in Ger-
many will drowne bastard childzen that be
cast in it, but dzybe aland them that be
lawfully begotten.

Hypanis.
Sythia.

The Riber Hypanis in Sythia, ebery day
bzings forth little bladders, out of which
flies doe come that dye that same night.

Matrona.

Matrona the Riber of Germany, as the
common people saith, neber passeth day,
but he taketh some pray.

Of the Sea.

The Sea.

The Sea, in this treatise hath place as
a mixed substance: for else the ele-
ment of waters being simple, were not
here to be spoken of.

The natu-
rall place
of the wa-
ter.

The Sea is the naturall place of the wa-
ters, into which, all Ribers and other wa-
ters are receiued at the length.

And here it is to be understood, that the
very proper and naturall place of the wa-
ter,

fer were to cōber all the earth, for so be the elements placed: the earth lowest, and round about the earth the water, about the water, the ayre, and about the ayre, the fire.

But God the most mighty and wise creator of all things, that the earth might in some parts be inhabited of men and beasts commanded the waters to be gathered into one place, that the dry land might appeare, and called the dry land, earth, and the gathering of waters, he called Seas. Gen. i.

In the Sea, are these two things to be considered, the saltnesse, and the ebbing and flowing.

Of the saltnesse of the Sea.

The saltnesse of the Sea, according to Aristotles mind, is caused by the Sun, that draweth from it, all thin and sweet vapours, to make raine, leaving the rest, as the setting or bottome, which is salt. Aristotle.
But men of our time, peradventure more truly, doe not take this for the only and sufficient cause, to make so great a quantity of water salt, but say, that the Sea, by Gods wisdom is gathered into such halleyes of the earth, as were otherwise barren and unfruitfull; such earths
are

are salt, the sea water then mixed with that earth, must needs be salt, else RIVERS by Aristotles mind, should be salt, as well as the Sea. The Reader may choose which opinion is most probable.

Of the ebbing and flowing.

Ebbing &
flowing.
Aristotle.

The ebbing and flowing of the Sea, as Aristotle seemeth to teach, is by reason of Exhalations that bee under the water, which drive it to and fro, according to contrary bounds and limits, as upward and downward, wide and narrow, deepe and shallow. This opinion of Aristotle also, is more subtil than true: experience teacheth men to mistake, and to ascribe the cause of ebbing & flowing, to the course of the Moone, which ruleth over moisture as the Sonne doth over heat: for from the new Moone, to the full, all humors do increase and from the full to the new Moone, decrease againe. Also, the very true time of the ebbing and flowing, may be known by the course of the Moone, with whom, as the Lady of moisture, we will close up the fourth booke of moist and watry impressions.

The

The fift Booke, of earthly Me-
teors, or bodies perfittly mixed.

This last Treatise contayneth such bodies, whose bodies. chiefe matter is the earth, and are called perfittly mixed, because they are not easily resolved into the chiefe matter whereof they are generated. These are divided into foure kindes. The first be diuers sorts of earth: the second be liquors concreat: the third be metals and metallikes: the fourth be stones. This division is not altogether perfect, both for that there bee many of these minerals, which partake of two kinds, and also for that the names of some of these kinds may be said of other. Yet minding as playnly as can be, to declare the things themselves, the controberſy and cabillation of names, shall not greatly trouble us, especially ſeeing we pretend not to teach Philoſophers, but ſuch as need a ruider & plainer instruction. They may therefore be content with this division, which shall not ſerue them to diſpute of theſe matters, but to underſtand y^e truth

truth of these things that they desire. Of these foure therefore, we will speake orderly and generally, not minding to intreat of ebery particular kinde (for that were infinite) but to open such uniberfall causes, as they which have wit, may learne, (if they list) to apply unto all particulars.

Of Earths.

Of Earths.

The earth is an element, one of the foure, cold and dry, most grosse and solide, most heavy and waighty, the lowest of all other in place. When I say an element, I meane a simple body uncompounded. This earth is no Meteor, but as it was shewed in the water, to the end there should be generation of things. There is no element that wee can have, which is pure and simple, but all are mixed and compound. Our fire is grosse and compound; so is our ayre, our water, and our earth: but the earth, notably and aboue the rest, is mixed. For the pure and naturall earth is dry and cold: but we see much to be moyst, and much to be hote. The naturall earth is black of colour: but we see many earths white, many yellow, and many redde. So that first, the greatest part

part of the earth is mixed with water, that maketh it to cleave together, with ayre and some fire, which make an oyle, fat, or clammy earth, as is clay made, &c.

Another great part is dried, not into the naturall bzinnesse of the first quality, but as a thing once mixed, and after dried, either by too cold, as sand, grabell, &c. or else by heat, as chalk, oker, &c. And yet somewhat moze plainly and particularly to discourse upon these causes, admitting the naturall colour of the earth to be black, of the water to be blue, of the ayre to be white, and of the fire to be ruddy, it followeth, that upon the mirtion of these colours, or chiefe domination of them, all things have their colour.

The grosse substance of the earth therefore, being diversly mixed with other elements, and those mixtures againe being effsones altered, by divers, & sometime contrary qualittes, hath brought forth so many kindes of earth, as clay, marle, chalke, sand, grabell, &c. Clay is mixed with fat moysture, taking his colour of the mixture with red from white, but being cold, it is not so fruitfull as marle, which is not allwaies so moyll as it. Chalke is an
earth

earth by heate concocted, after diuers mix-
tions, and dried up. Oker, both yellow and
red, with such like, are of the same nature,
with mixtion of red, more or lesse.

Sand and grabell, are dyed earths,
as it were frozen by cold: grabell is grosse
and apparent; sand, though it be finer, is
of the same generation, consisting of ma-
ny small bodie, which are congealed into
stones. Sand seemeth to be clay, dyed by
cold, and coated together into small stones,
whereof some are thorow-shining, which
were the moist parts; the thick were of
the grosse part: the same is grabell, but of
greater stones consisting. The like iudge-
ment is to bee given of all other kinds of
earth, whose generation, by the similitude
of these, will not be very hard to finde out.
They that list to know the diuers kindes
of earths, must haue recourse to Plinius,
Cardane, and other writers, that recite a
great number of them: but these are the
chiefe and most common kindes.

Plinius.
Cardanus.

Of liquors concreate.

WE take not liquors concreat so large-
ly, as the word doth signifie: for then
should we comprehend both the other kinds
follow-

following. But only those liquors, called in Latine, Succi, which are, as it were middle betwene metals and stones, of which, some being fat and oily, doe burne as Brimstone, Sea-coales, Zeat, bitumen, &c. and the kinds of all these. Other some doe not burne, as Salt, Allum, Coprus, Saltpetre, &c. and the kinds of these.

Of the first sort, which are generated of earthy and azy vapours, fumes and Exhalations, the chiefe and most notable, is Brimstone, which seemeth to be the master of all dry and hot qualities, that are in earthy Meteors. The rest are generated of such like vapours as Brimstone is, but then they be diversly mixed: as the coles have much earth mixed with Brimstone: Zeat seemeth to be al one but better concealed than coles. Of Amber is great contention, whether it be a minerall, or the sperme of a Whale: for it is found in the Sea, cast upon the shoze. Now the Whales seed being of the very same qualities is taken more & lesse concreate of divers hardnes; some almost as hard as Amber: some softer, and some liquid: yet Cardan plainly defineth, that Amber is a mineral. Whether he have Reason or experience, contrary to the vulgar opinion,

Cardanus.

opinion, let them consider that list to contend. These minerals that will resolbe with fire, it is apparant, that they were concreate with cold: in that they burnt, it is manifest, they have a fat and clammy substance mixed with them, as the other kinde hath not, which will not resolbe so well with fire, as with water; which be salt, coperus, saltpetters, &c. These burne not, being watry, earthy, and not fat, unctuous nor clammy.

These be of diuers colours, black, as Coles, and Jeat, because there is much earthy substance mixed with their sulphurous matter. Some be where, as Salt, and Allome, having a substance watry, dyed, and concreate. Coperus is greene because it hath much cold matter that is blue, mixed with it. Salt, the most common and necessary of all these liquors concreat, that be moist and not fatty, hath two manner of generations, one naturall, and the other artificiall. The naturall generation, is, when it is first generated in the earth, after commeth the water of the Sea, and is infected with it; out of which the Salt is againe artificially gathered. Of these liquors concreat, bee these

those strange wells and springs infected of which was spoken in the latter end of the fourth booke. Most notably brimstone causeth the hote bathes, and burneth in Aetna of Sicilia, and Vesuvius of Italy, casting up the Pumise Stones, of which is no place here to entreat.

Aetna and
vesuvius.

Of Metals.

Metals be substances perfectly mixed that will melt with heate and be brought into all manner of fashions that a man will. Of these the Alchemists say, there be seven kinds, to answer to the seven Planets: Gold, Silver, Copper, Tinne, Lead, Iron, and Quicksilver that they call Mercury. But saving their au-

Metals.

Mercury.

thorities Quicksilver is no more a metall, than Brimstone, which is as necessary to the generation of metall, as quicksilver is. For they all agree, that all metalles are generated of Sulphur, that is, Brimstone: which because it is hote they call, The father; and Mercury, that is, quicksilver, which because it is moyst, they call, The mother. So by as good reason, may they call Brimstone a metall, as Mercury. Then there remaineth

A

meth

meth but six perfit metals, Gold, Silber,
Copper, Lynne, Lead, and Iron.

Of Gold.

Gold,

Why Gold
rusteth
not.

The opini-
on of the
Alchemists.

That most unprofitable and hurtfull of
all metals, Gold which most men dis-
praise, and yet all men would have, is of all
other metals the rarest, it is onely perfit,
all other be corruptible. Gold never cor-
rupteth by rust, because it is pure from
poisonous infection, and most solide, that
it receiveth not the ayre into it, which cau-
seth all things to corrupt. It is perfectly
concocted with sufficient heat, and mixture
of Sulphur: all other metals, either are not
so well concocted, or else they have not the
due quantity of bymstone. This opinion
hath also place among the Alchemists, that
because nature in all her works seeketh
the best end, she entendeth of all metals to
make Gold: but being let, either for want
of good mixture, or good concoction, she
bringeth forth other metals, indeed not so
precious, but much more profitable: and the
lesse precious, the more profitable: for there
is more use to the necessity of mans life,
in iron and lead, than is in gold and silver.
But either the beauty, or the perfection, or

at

at leastwise the rarenesse of gold and silver have obtained the estimation of all men, so that for them is sold all manner of things holy and pzoophane, bodily and spirituall. What paines doe not men take to winne gold : ebery man hath one way or other to hunt after it : But the Alcumist despising all other wayes, as slow, unnaturall, and unprofitable, labourerth, either to helpe nature in her worke, as of unperfitt metals to make perfitt, or else to force nature to his purpose, by his quintessences and elixors, so that what by purging, what by concocting; what by mixing of Sulphur & quicksilver & much other like stufte, at length he turneth the wrong side of his gowne outward all the teeth out of his head, and his body from health to a palsey, and then he is a Philosopher, and so he will be called.

Of Silver.

Silver, the most pure metall next unto Gold hath indifferent good concoction in the earth, but it wanteth sufficient heat in the mixture, that maketh it pale. It is found (as they say) running into divers beines, as all other metals be, but this most specially, after the shape and fashion

Silver.

of a tree, lying along with a body of flock, of proportion like to the body of a Tree, also with armes, branches, leaues and fruites. This metall, Silber, lacketh sufficient heate, and therefore cometh neither to the colour, soliditie, nor perfection of Gold, and is generated in cold countries, nere unto the North and South poles, in so great quantity, that the husbandmen, when they plow their ground, turne up Silber, among the clots in their daily labours, which they doe hide and conceale lest the greedy Princes, for covetousnesse of the metall, should overturne and destroy their land.

The Gold mines are contrariwise most found in the hot countries of India and Aethiopia, because in them is sufficient of heat, for that unhappy generation.

This Silber also, the Alchemists would faine make by Arte: but Mercurie the chiefe Master of the worke, is so subtil and so flye, that nothing can holde him, nothing can kill him: for if the glasse bee not very thicke, hee will soon breake out of prison, and so there is nothing left.

Of

Of Copper.

Copper, in colour, coming neereſt to Gold, being not ſolid nor maſſie, (for of all metall, gold is the heauiest) giveth way to corruption, being infected with that greene minerall Copperus. Hereof be diuers kindes, bzasse, latine, and ſuch like, which differ in digeſtion: the Copper being pureſt, is of beſt digeſtion, and neereſt unto Gold; and ſo the reſt in like degrees.

Copper is moſt like to ſilber in the waight, and in the hammering, wherefore the Alchemiſts have learned to make it white, that it deceiveth mens ſight & handling: but the Goldſmiths doe eaſily try it, and by the taſte of counterfeit ſilber, make copper again. Copper or bzasse doth alway grow neere to the mine of Copperus, which running with it in the digeſtion, or naturall concoction, hindzeth it of perfection, maketh it to ſink, and to be eaten of a green ruſt. much adoe the Alchemiſts have to turne it into gold, if it might be, they diſpute very reaſonably and conclude almoſt neceſſarily in their talke, that it may be converted into gold, as a body that wanteth little of

A 3 perfection,

D. Fulkes booke

perfection, which may be easily added unto it. But in conclusion of the worke, it is an harder matter to bring it to passe, than it was to purpose, befoze they had done it, to build an Abby at every miles end, upon Salisbury plaine, as one was minded.

Of Tinne.

Tinne.

Tinne, whereof great plenty groweth in the west parts of England, in beauty and colour commeth nearest to Silber, and of Silber wanteth nothing but solidity and hardnes: for Tinne is raw & undigested metall, also very porous & uncompact, which causeth it to crash, when it is broken or bitten: so it sayleth of heate in the commixtion, and also sufficient digestion in the earth: otherwise it is a faire and profitable metall, to serue the use of them unto whom Silber & gold are not so plentiful.

Of Lead.

Lead.

Lead also, found in great abundance within this Realme, is a raw and undigested metall, as Tinne is, but yet of better digestion than commixtion: for it is mixed with a grosse earthy substance, which maketh it to bee in colour so black and so soyle to corrupt: so that of the same fumes

and

and Exhalations, (which if they had been pure and well digested, if the place and matter would have suffered, should have been concreat into Silber) for lack of the same, Lead is generated, which comming plentifully, doth better service than Silber.

Of Iron.

Iron, the most necessary and profitable Iron.
 of all other metals, (and yet as ill used of many, as any other, is generated of such substance as Silber is, but mixed with a red minerall, which eateth it with red rust, and also being of too extreame digestion, passing all other metals in hardnes. And as other metals, to the perfection of Silber, want sufficient concoction, whereby they come not to the same hardnesse: so Iron passeth and exceedeth Silber in immoderate digestion. But though it come not to the perfection of Silber, God forbid, that all Iron had bene turned into Silber; for then we should more have missed it, than Silber or gold, the want of which would hinder us nothing at all.

Of Quicksilver.

Though Quicksilver be no mettall, yet Quick-
silver.
 because it is the mother of all metals,
 something is here to be spoken of it.

There be diuers and sundry opinions, both of the generation, and also the qualities of it, which make the generation to bee hard to finde out. For if the quality were certainly agreed upon, there were an easier way found, to try out the generation. Some affirme, that it is exceeding hote, and that they would proue by the swift pearcing thereof into other things that bee porous.

Other say, it is exceeding cold, and that they proue by the exceeding waight of it, As for the pearcing, they say, it is caused of the exceeding moistnesse, of which quality both parts doe graunt that it is. Concerning the generation, some have said, that it is pure and elementall water: some againe have thought, that it droppeth out of Heauen, and is a part of the Heabenly substance. And other said, that it is generated in the clouds, and falleth downe in the field, in a circle, on those round circles, which are seen in many fields, that ignorant people affirme to be the rings of the Fairies dances. It is certayne, that quicksilver hath diuers times fallen out of the clouds, as we have declared in the treatise of wonderfull and marvellous raine: but

but whether it so fall in circles it is doubtfull. The most probable opinion is, that it is generated of moyst vapours of the earth, cooled by cold, much like to water, as Whimstone is of hote lumes, cooled by cold, much like to fire. And thus much of metals.

Of Stones.

Stones, the fourth kinde of earthly mix- Stones.
 Sed bodies, have two manner of generations, by most contrary qualities: for heat doth harden moist bodies into stones, as we see, that of clay, it maketh exceeding hard brick.

Also the thunderbolts in the clouds, are generated by heat, as before hath beene shewed. But cold doth by congealing, generate many more stones than heat doth, for the most part of all the stones that are digged out of the earth, are generated by cold, which is able to conuert any other kind of mixed substance into stone, as hath beene partly shewed in the nature of wells and springs, of which, there be some in England, which by their colde, turne wood, or any like thing into stones. I
 have

D. Fulkes booke

I have seene a peece of rotten wood, which
so light was very light, and like wood, but
in handling, a very stone that was taken
out of such a Well. Also of other things ta-
ken out of the earth, turned into stones, I
have seen and found my selfe, flies, with
head and wings very hard stones, also, I
have seen a heart, a birds tongue, a beasts
stone, a peare, a plumme; and others other
things turned into hard stones.

Of the divers kinds of stones.

Rockes.

Pibble
stones.

Marble.

Stones may first be divided into rude
and beautifull: the rude contayne those
great Rocks, which are generated by ma-
ny small parts toynd together, and the
common pibble stones, that be found eve-
ry where in the earth, among gravell, and
on the shoze of the Sea, or banks of the Ri-
vers. These are generated of grosse and
earthly humours, congealed by cold, and
because they be neyther faire of colour,
nor thozow shining, and also common, they
are contemptible. The faire or beautifull
stones, be either great or small. The great
be, as marble of divers kinds and colours,
alabaster, and such like, which being hard
and well conected, may be polished and
become

become beautifull. Their colour is as they are mixed being uncongealed, so is their purenesse. The small are moze precious, and they be either thick or pellucide. The thick be neither so faire nor so precious, as the Achates, the Jasper, Prassios, &c. These consisting of a pure matter, and not very watry, are congealed into such stones. The cleare stones be liquors concreate, as the Diamond, the Saphir, the Emerald, &c. they are praised for their greatnesse, hardnesse, clearenesse, and faire colours, of which enough hath bin spoken, saving that some be of opinion, that these be generated by heat, because the best are found in hot countries, in the East, and in the South. Answer may be made, that the hotter the ayre is, the colder is the earth: so that reason is of small force.

Achates.
Jasper.
Prassios.

Diamond.
Saphir.
Emerald.
The praise
of precious
Stones.

Of the vertue of stones.

Some perchance, would looke that we should make a long discourse of the vertue of stones, and would be well content that we should entreat of divers properties of gemmes and precious stones, which matter though it be out of our purpose (which considereth only the generation) yet seeing it is

The ver-
tue of
Stones.

is not out of their expectation, some thing
brievely, and yet sufficiently shall be said of
the vertue of stones.

The vertue
of stones
either na-
turall or
magickall.
Magnes.

What vertue that is ascribed unto them,
is either naturall, or magickall. Naturall
vertue, is either that which is known to
have a naturall cause, or a naturall effect,
as the Magnes or Load-stone, to draw
Iron, which is by a similitude of nature,
and such an appetite, as is between the
male and the female. Also, the said Mag-
nes moveth toward the North, and as some
say there is another kinde, found in the
South, that draweth toward the South.
They say, that there are great hills of this
stone in the North and South, which ma-
keth it looke that way.

Other bring a Mathematicall reason,
which because it is more curious, than can
be understood of the common sort, not ex-
ercised in Geometry, I omit.

Heat and
Amber
draweth
chaffe.

Astroites,
a stone mo-
veth in vi-
neger.

The Heat and Amber drawe hayres,
chaffe, and like light matter, but being be-
fore chafed; for heat is attractive.

Also the precious stone called Astroites,
moveth it selfe in vineger, the sharp-
nesse of the vineger pearcing it, and the
ayze excluded, driving it forward. These
vertues

vertues because I haue séene, I haue set
 for an example: generally all other like na-
 turall vertues, procéde of like naturall
 causes, which by their effect, the ingenious
 must seeke to finde out. As for magicall
 vertues, be they, which are grounded of no
 reason, or naturall cause, which if they
 take effect, it is rather of the superstition &
 credulity of him that useth them, than of
 the vertue of the stones. As that an Eme-
 rald increaseth love, a Saphir favour, a
 Diamond strength, and such like vertues, Albertus
Magnus.
 of which Albertus in his age, surnamed the
 great, tooke paines to write a booke, which
 I suppose to be englished. To conclude with
 the cause why stones melt not, as metals
 doe, may be gathered, by that which hath
 bin said befoze, because they are conge-
 led past that degré, and also because there
 is left in them, no unctuous, or clam-
 my matter. Let this suffice for
 stones: and so the whole
 purpose is at an
 end.

FINIS.

D. Falk.

a
Anne Knollys

Her book

664

Arms

can

cap

Handwritten flourish or signature

C.P.
95th
except 1st & found flowers
names cut off blank of little info
Car
after 100 years, little known.



14444

