

On the Nature of the Elements^{1, 2}

*Ein Kurzer Tractat von der Natur Der Elementen Und wie sie den Windt/Regen/Blitz und Donner verursachen/ und war zu sie nutzen Durch **Cornelium Drebbel** in Niederlandisch geschrieben unnd allen der Naturliebhaberen zu nutz ins Hochteutsch getreulich uber gesetzt. Gedruckt zu Leyden in Hollandt/ Bey Henrichen von Haestens im Jahr Christ 1608.*

A short Treatise of the Nature of the Elements And how these cause Wind/Rain/Thunder and Lightning/ and why these are useful. By Cornelium Drebbel, written in the Dutch language and to the benefit of all lovers of Nature in HighGerman translated. Printed in Leyden in Hollandt/ by Henry van Haestens in the year of Christ 1608

Vorrede Von den Elementen.

Dear reader, when this current treatise reaches you, may you well believe that I have written it for your use and not for my honor, since I well know that the fame of this world is vain. Are we not created innocent and humble by God? The which innocence we lost through insolence and misdeed, and therefore we have many judgments and opinions differing one from another, and we do not know each other, but if we hate insolence won't we be then innocent, wise, and humble? Are we not all brothers? what do we have that praises us? Therefore we flatter ourselves when we consider ourselves to be something, and desert our brothers and thereby we neglect to consider the goodness of God who is bountiful and gives us more than we pray for. Let us test ourselves, are we not created by God as Kings with the costliest jewels? Do we not have all the riches of the world for our use? When we must leave the world will not God give us the imperishable heavenly gifts which are a thousand times greater? Therefore beloved reader why do you not love your neighbor just as you will be loved by God? If I am ignorant are you not more ignorant? Must I therefore suffer a handicap? Are you not more handicapped without God? Why do you not teach me what you have been liberally blessed with by God? Will I therefore hate you? Certainly not. If I hate you do I not hate myself? Since as you are I also am, shall I therefore glorify myself? No, rather I should humble myself. Can we glorify ourselves other than in God, who loves us all? Therefore those who seek glory have they not lost God? But he who humbles himself, does he not obtain honor? This I saw in my humility, my honor was my sadness, my sadness the sting of Death, Death my victory, my victory my soul, my soul my kingdom, my kingdom God, out of whom it was that I am and in whose being I shall find my conclusion. What should we do in gratitude? Should we offer myrrh or sacrifices? should we allow ourselves to be tonsured or to cut our beard? should we raise our chair and preach in white or black robes? shall we write large books to praise God with them? Is that not vanity? Beloved brother, what can we give God who has everything? What shall we then do? We shall be grateful and learn from God's son humility and the short command, Love God above all and your neighbor as yourself. This is the law and lesson of all the apostles and prophets, which God himself teaches in Nature. Therefore when I saw how pride misleads men and prevents them from understanding nature, I was moved to love my teacher Nature and to know God from his creation which I regarded with awe. I investigated the elements which taught me the nature of earth, I saw their crystalline spirit like a fog, their colored soul, like blood, their steadfast body like a crystal. I saw the spirit fighting and conquering body and soul which then became one. The body served the spirit and body as a secure dwelling, the spirit illuminated the body and the soul like a crystalline heaven, the soul tinged body and spirit with its heavenly ruby red color. I saw Death, resurrection, and immortality before my eyes, I was grateful to my God and loved Nature, and undertook to finish this little book serving you, dear reader, I hope that you will not scorn it as ignorant, nor blame me for not informing and strengthening my writing with the ancient authors, since to tell the truth, I have not read any of those. But I give you just what I have received from nature. I assure you that here you will find here what has been hidden from many, and if you do not comprehend me correctly, what it is useful for will be unknown to you. About which I remain silent due to your incomprehension so that thereby I do not give myself away too openly, but I hope that when my soul has conquered my body it shall openly come to light. It is nothing new, indeed, it has been around for a thousand years, and therefore I wish to write concerning the common elements as they are best known to you so that you may learn to know the rest, namely the earth, since the earth is not as simple as fire, air, and water, but it is the impure remainder so that one finds the four elementary natures completely in the earth, and their growth, with which we bring our work to completion. The fire, water, and air are servants of the earth, the fire works in the air, the air in the water, the water creates damp in the earth,⁶ as I shall hereafter narrate more fully, taking my beginning from the Creation, and relating of that as much about it as we may understand through the grace of God.

The First chapter.

All things have their beginning from God and will find their ending in him. Since the end of all things (as we see daily) is their beginning, what comes out of the earth becomes earth again, what comes from water [becomes] water etc. all things were in their beginning by God

¹ Translation by Dr. Vera Keller –extract from her Dissertation: **Cornelis Drebbel (1572-1633): Fame and the Making of Modernity**, Princeton 2008/09, has translated from the 1608 German edition as the earliest edition available. The 1621 Haarlem Dutch edition might be identical to the now lost 1604 original, but there is no way to know. I have indicated points of difference between this edition and Lauremberg's 1628 Latin translation and the 1621 Dutch edition in the notes.

² www.drebbel.net **Cornelis Jacobszoon Drebbel** born in Alkmaar Netherlands 1572 dies London 1633

perfect, and will become again in the end perfect, when the elements will melt and again reunite in clarity by God. There will be nothing which will come to nothing other than injustice. When the time had come, God out of his ineffable wisdom created all things. He at first separated from the other creatures the most subtle, namely the Fire, which taking its place in the sublime, filled the infinite vastness and embraced the entire glory of the Lord, since all that is light rises upwards. Afterwards God had again separated the most subtle and light, namely the air, which had its place next to the fire. Thereafter remained the rest wet and heavy, so God again separated the subtlest and the wettest from the rest, namely the earth and the water. The water covered the earth, the fire the air, and the air the water. God through his divine power lifted the earth from the depth of the water and set us in the middle of his creation so that we might better see the glory of his clarity and love him not as the Angels do but due to the perfection of his creation. Thus God separated his creation in four parts, the fire, air, water, and earth, and each had its power according to its subtlety. In that the fire exceeded everything and had the power to make them have a clarity equal to its clarity. It gives all things life and without it all things are dead, as we see every day and especially in winter. We see that fire first clarifies the air and makes it have a clarity equal to its own, and it illuminates it from all darkness and makes apparent what was hidden in darkness, and clarifies it from vaporous damp and all earthly clouds. It purifies the air also from all massiness and makes it piercing through all solids. *In summa* the fire makes the air equal to itself in everything, so that there is no distinction between the two, as we see in our common fire, when it is fed with peat or wood, it pulls and sucks to it the air with great force, which it purifies, clarifies, and makes equal to itself. It is so inclined to clarify the air, that when it is prevented and may no longer do this, and the air is cut off from it, (this is when the fire is enclosed), it disappears and goes back whence it came, which is worthy to be noted. Since first of all teaches us how God's creatures observe their duty and work as long as they find material and the more they find the better they clarify, unless they are hindered. From that we too may observe our duty and allow God our creator or his gifts to work in us unhindered whereby we go from one light into the next and through the light of his clarity we may become clarified.

Chapter Two

Just as the Fire works in the air it also labors in water and earth which we see in peat or wood which become clarified like air. Seeing how black the coals are outside the fire and in the fire they are as clear and light as the fire and they become clarified through the fire and transformed into an invisible form as in their first essence ("wesen"), and the ash man can also transform and clarify like glass and furthermore make it invisible. Now someone might ask how it is possible that the water is formed from the same thing from which the Fire is made, since all things share commonalities with the things from which they are made which the fire does not do, and therefore it is impossible that the water could be clarified through Fire. Here I answer that two contraries cannot be united without a medium, since when God had separated the subtlest, clearest, and driest portion from the first creation, then immediately its contrary was created, that is the coarsest, darkest, wettest, and coldest, which is the massiness of the earth and the dampness of the water, the which dampness of the water was modified through the dryness of the air and the earth, and thus also the massiness and dryness of the earth through the subtlety of the air and the dampness of the water. Therefore one can see that no unification occurs without a medium. Therefore the water cannot be unified with the fire without the subtlety of the air and the dryness of the earth, which mixture occurs in the form of an Aqua Vita, or oil. O depth of wisdom, how infinite is your creation and how praiseworthy your work. Who shall not believe you who has only observed the light of nature? Who shall not be amazed who only sees the creation before his eyes? Rather, how may you observe the wonder of God without awe? Why in seeing are you blind, and do not remark the work of God? Do you also not praise God who shows you the first being or the genesis of his creation there appearing in fire, air, water and earth in the form as it was created by God. Note further how the elements separate, the spirit of fire rising aloft and carrying with it air, water, and earth which is cooled through the cold of the air and becomes massy and returns to that which is similar to it, from whence it came. The dampness of Oil, which is water, becomes transformed into a cloud and falls down in water drops, the earth rises off as a mist and falls down as black as it, the air becomes embraced by itself. Who can learn the cause of this and forget to praise God? It is also clear that the fire is the life of everything and also that it clarifies and changes everything as it was in the beginning by God, water as much as earth and air. But [this does] not [occur] without a medium and therefore the massiness of the water must be modified through the subtlety of the air and the dampness through the dryness of the earth, and then the *materia* is ready, and can be clarified and made living from the fire, about which much could be written, but I have omitted that, taking care that we may sooner come to our proposed subject [proposito].

The third chapter

Now we will observe the virtue of the air within the other elements. Since just as the three elements are dead without fire, so also the fire is dead without the elements, from which can be seen the complete wisdom of God who created nothing in vain. Thus just as the fire is life and lives in the air, the air also lives in the fire, that water in earth, the earth in water, the water in air, etc. The fire purifies the air, the air the water, the water the earth, and each one makes the other through the fire of the same clarity as its own. Observe how in the summer through the power of the sun, the Water is invisibly drawn up and is clarified through the air in such a way that there is no difference between air and water, as we note everyday in water which is set in the sun and is pulled up and remains subtle as long as it is not made massy from the cold. Since just as the fire sublimates all things, the cold which is the contrary of the

fire, coarsens everything and again condenses the Water, and takes [away] the warmth of the fire and the subtlety of the air. Thus the water falls down again in drops. These drops receive from the earth the nourishment or the nature of the elements and thus the seeds penetrate and into the roots, but then through the heat of the sun they pull upwards into the top portion of the plant, where it leaves behind the spirits or elements of the earth. Through the heat of the sun, and the nature and life of the plant, the earth is transformed in keeping with the form and power of the plant. Thus the growth is nourished and transformed through the constant dissemination of the water, from which we see the good order and wisdom of God our creator. But if the cold is very great the water is congealed and changed into the form of the earth. Just as the cold, as the effect of the earth, thickens the water and makes its thickness and hardness the same [as its own], thus the air also thickens the fire, when the cold of the air is greater than the heat of the fire. The fire is changed into the form of the air, the air into the form of the water, and the water into the form of the earth as the foregoing demonstrates. This is a wonderful thing, which is confirmed through our previous rationes concerning the separation of the first essence (wesen). Then just as God separated the elements from his first creation, thus also the elements are once again through our fire (as a shadow of the first essence [wesen]) brought into their first form, which we easily may see in a burning torch and in all combustibles, since as soon the lamp is lit, the oil is clarified through the element [of fire], so that nothing distinguishes between the oil and the flame, nay further the oil is the flame and the flame is the oil which passes through the flame and is immediately through the cold (as the contrary of the fire) brought into its element as explained above. Therefore he who observes the flame with diligence notes not only the reduction and clarification of the element into its first essence (wesen) but also the separation out of the first into the elements which is an incredible thing that is worthy of being noted and about which we wish to speak further at the proper time.

The Fourth Chapter

If we consider what was taught above, and understand it well, we will completely comprehend the operation of the wind, thunder, and lightning. Since when the rays of the enlivening Sun unhindered penetrate the air around the thick cold water, clarifying and warming it, then the air is expanded, rarefied, and changed into the nature of fire, and the water into the nature of air. Thereafter follows a constant movement which spreads over all the Earth to moisten it. But the thinned water which sails above the Reflection or hot air into the thick, close, and cold air will be again be minimized and changed into the nature of water and falls downward with drops. Then the quiet must follow just as we find when it rains, unless the upward pulling [or evaporation] is longer lasting and more powerful than the cold air's coarsening and condensing. Since just as the heat makes the air and water subtle, thin, and large, the cold as a contrary of the heat also coarsens, reduces, and condenses. Thus it pulls back in again all the wind which through the heat had gone out, just as we see clearly when we hang an empty glass retort with the mouth in a vessel with water and we lay a hot fire under the belly as this Figure illustrates. We see that as soon as the air in the glass begins to be made hot, the wind shoots out of the mouth of the retort and that water is filled with bubbles. This continues as long as the air continues to be warmed, but when you take the retort from the fire and the air begins to cool, the air inside the retort will be condensed again, and becomes coarse and thick so that the glass will be filled with water, after the air was before heated, released and rarified by fire. If you could heat the glass very hot without breaking it, then the retort when it cools again would be full of water. For this a stone retort is much more suitable, but in order to see the filling a glass one is much better and the more heavier and thicker than the air the water is, the more it will through the heat be resolved and enlarged, yes many thousand times more as we see when we roast an apple how the wind shoots out and yet we see almost no lessening of moisture. Also when we wish to lute an iron oven, we leave a hole in it and after we have made it hot we let fall a drop of water through the hole, the water will immediately be enlarged and like a fast wind pass out through the hole.

Chapter Five

But when around evening, the evaporation of the water through the setting of the sun is lessened, we generally have quiet, although the water never is without evaporation, unless the cold is so great that the water freezes. Just as we see when we fill a large, wide pan and set it in a cold room, and then after a few days we will find that the water is lessened, the cause whereof is that the air around the room is somewhat warmer than the water. But when we feel no calm in the evening it comes from our being far from the place where the water and air were resolved. The wind comes after the resolution, just as we see from a noise made far from us, whose sound we hear after we see it. This is why we do not hear the strong movement due to the setting of the Sun, and likewise for a long time we are not aware of the movement of the wind following it, and therefore we feel through one wind more quiet than through another depending on the situation of the place. But if we are close to the place, we have quiet, and as soon as the evening begins, and we also have at certain times of the year a lot of rain, as in March, April, May, September, October, and November whose cause may be understand from what was said before. Since in these months we are [alternating] between cold and heat, and therefore the sailing clouds cannot be released and enlarged for the second time through the weakness of the heat, but the air is then suitable to change the condensed clouds into rain, and therefore when it is the coldest in these cold lands we have little rain since the clouds fall below due to the cold of the air before they reach the coldest places, unless the pulling up will be very great and of long duration, and through the southern wind, the cold will be overcome or the clouds carried off by a strong wind and quickly sail by these places and through the great cold are changed into snow. Therefore my Brother, if you consider this in its foundation, you will correctly understand the previous

example of wind, more than I could write it, and therefore I have written only what is necessary for us to understand the foundation and also the following.

The Sixth Chapter

Someone might ask how it is that in the summer we often feel the wind from the clouds, and not from the place where the water has been thinned or evaporated, which is contrary to the former account? Here I answer that previous example is confirmed through this. Since after the sun has sublimated and evaporated the water up until the cold air, it will be by the cold of the water a little coarsened and it pushes downwards like a thick fog until the *Reflection* of the Earth, where, since the air is notably warmer there, the foggy clouds are again expanded and rarefied. Thus the following air is moved by them, and the close, thick, and cold air that is over the *Reflection* also comes down with the sinking of the thick clouds and in other places through the heat it is expelled and therefore the wind multiplies and expands itself on all sides. Therefore also often the clouds push against one on another, since the cold thick air sails above the warm up to the cold places, where, under the shadows or cold of the clouds it is burdened and afterwards through the heat is once again heated and raised above the *Reflection* of the Earth. And thus the winds come and go and cool the Earth through the wise ordinance of God. Therefore we feel the wind from the place where we see the thick and black clouds sailing. When in the summer we see a thick fog rising in the southwest, we feel afterwards a southwesterly wind, then a westnorthwestern, northerly, and northeasterly wind, etc and so on out of all the places where we see the fog. This same cause is why the wind is sometimes so strong, and why in Holland and surrounding places, with the easterly or southeasterly wind it rains so much, but which the northwesterly wind it is so variable, now with a little rain, and then following a quiet a stronger wind, and also why in the warm lands which border the sea, the wind during the mornings and the entire day comes out of the sea and in the evening or after midnight from the land. The causes of these one could demonstrate with natural *rationes* but he who understands the foregoing causes will understand that more fully than I could describe it. Therefore we will leave the wind and begin with thunder and lightning.

The Seventh Chapter

When it thunders and lightning strikes, the air is dry, subtle, and very hot, and the water which through the heat of the Sun has evaporated, is changed into the form of air and sails into the heights above the *Reflection* of the Earth, and through the cold it becomes again coarsened and condensed and changes again into water and therefore sinks like a fog and is driven through the cold air into the subtle, dry, and hot air which quickly penetrates the coarse and thick clouds, makes them subtle and thin and changes it again into the nature of the air. Therefore their form in a blink of an eye is enlarged by many hundreds of times and thus follows the terrible movement which with bursting and cracking, rents the air and moves it until there is an equality in the size and thickness, and then there is peace again, just as we see when Saltpeter is broken by fire and changes into the nature of the air, or when we throw a wet cloth on hot iron or molten lead, which through release and expansion of the heat crackles and bursts just like thunder. Thus we see in a tinderbox, through the rapid breaking of the [flint] stone, the cause of the burning clarity etc. But when the left over clouds sail over the places which through the lightning or through expanded clouds were coarsened and cooled, if they then pass again into subtle and hot air which rises aloft and penetrates them, making them thin and changing them into the nature of air, then we hear various clangs which last continuously in all places which through the heat of the Sun were made so very thin and then afterwards were tempered and cooled.

The Eighth Chapter

Therefore we discover how God moves us through nature to know and to love his wisdom, goodness, and omnipotence. Consider his good and wonderful ordinance which we discover in all creatures, note how wonderful (as can be seen in the previous causes) it is that the thick water becomes invisible through the sun and is rarified and expanded into the form of air which also causes the motive power of the wind. Then it sails and expands over the lands, where through the lack of water there is no condensation and coarsening, and there it is pulled upwards through the heat of the Sun up to the cold air above the *Reflection* of the Earth where it is once again coarsened and condensed like a fog through which the quiet of the evening is caused, and the air which appears foggy becomes coarser and thicker through the clouds and is changed into waterdrops, and moistens the thirsty Earth, which melts and rots in it, and through the wetness the earth penetrates the plant, but through the heat of the sun the wetness is pulled up to the uttermost part of the plant and since the water is more flighty than the *nutriment* of the Earth, the water dries into the air and leaves behind the *nutriment* which through the life of things is changed into the nature of the plant and thus all the creatures of the Earth are sustained and multiplied out of this single substance. Therefore they once again through *putrefaction* are changed into earth. This is something everyone sees, but hardly a single person out of a thousand properly understands. If this were known many alchemists would not struggle so pitifully to discover their *materia*. But when the evaporated fog again sails into very hot places it causes thunder and lightning (through the sudden expansion) and wind: But when the air naturally becomes just a bit hotter than the fog, it gives out only wind and rain as we explained previously at greater length.

Chapter Nine

Now we have in my opinion understood enough of the occupation of fire, air, water and earth to understand the power of nature and what each element is, namely that fire is a subtle air, the air a subtle water, and the water a subtle earth and the earth a coarse fire as may be sufficiently understood from our previous examples. Then the earth, resolved through the power of [alchemical] fire or the purification of nature, changes itself into water,

becomes salty, and a power of the Earth, as we clearly find in Calcination: The salt, resolved through fire, is changed into water which the *Distillation of Aqua fortis* shows us sufficiently. And that water then is resolved through the fire, is changed into air, and the air into fire as was shown above, and thus the coarse, dark earth is transformed into the most subtle, transparent, shining, and penetrating fire which penetrates and clarifies everything and makes anything else penetrating and clarifying.

The Tenth Chapter

Therefore we must understand that also that which was created out of the Elements is clarified whether it be mineral, animal, or vegetable. So if we want to clarify any of those it can only happen through the means specified above: we must clarify the earth through fire and first make it like water which is like a salt which one clarifies and distills into a water like the body of air, clear like crystal and transparent like air and shining like fire. With that we must be content, and no more clarification is necessary since we cannot keep any invisible *spiritus* unless it be in a body, since otherwise it would be lost. So that when it is clarified into the form of water, it should be changed through distillation into the form of air and through the coarsening of the cold it should be changed again into water as a visible body. But if we clarify it into the form of fire and then coarsen it through the cold into the form of air, how would we then use it? for that is the clearest of all visible things and unusable for us. Therefore we should clarify it into air which through the cold is coarsened into water and not further. Since all things which are reduced into their highest perfection, have no generation or multiplication. But when we have clarified this through distillation into a clear, transparent water, oil, or whatever one wants to call it, then we see in our *corpora a sperma* which rots within and is clarified into an equal clarity. We also make earth from water through the power of fire, continuing only like nature, and we make the grey earth white, clear, and transparent as air. But it is still in a visible form, and thereafter from the form of air [we make it] into a fiery, clear, clean, and unbesmirched red color like a ruby, which exceeds all creatures in perfection. And so if we wish the clear, unbesmirched fire to have still higher clarification, it must be brought back into its previous essence (*wesen*) through water (as was said) in order to support *generation* and also so that through the purified complete seed (in cold, in heat, this is fire on the outside and wet on the inside) makes a *generation* in the moist water, which is dry on the inside, etc. allowing nature again to elevate and improve it, as above. Through which *reiteration* our *materia* becomes so clean, penetrating, and subtle, that it is incredible, and also so that in short it penetrates all vessels and will be lost.

The Eleventh Chapter

Now you might ask how it is possible to improve things thus. Don't we see that all seeds bring forth things like themselves, sometimes a little better and sometimes a little worse? How could we clarify through fire more than God through the Sun? Here I answer that our clarification occurs in another manner. We take the *corpora* which God had clarified through nature, and we clarify them again through fire and water. We make them clear as crystal, and purify them from all the impurities which Nature had left inside them and we bring them into the form of water within which the nature of the earth is hidden inside and in which, as said, we see our *corpora*. Through the clean water we purify it and make the one equal to the other in clarity, which does not occur in nature. Therefore all things stay in the form as God created them. For the seed which is planted in the earth will not be clarified through the earth, but the earth will be clarified by fire and the life of the seeds, since the earth is less pure than the seed, and therefore the seed remains always in a single essence (*wesen*), and tinges the impure earth in its form. This dear brother, I have written concerning nature as I have discovered it with [my own] hand.¹² Since nothing has drawn me more to God than knowledge of nature, I have had to write concerning the nature of the elements, since they are a habitation of nature, without which we do not know nature. We live in them and are sustained by them so that if we do not know them we do not know either nature or ourselves. Therefore he who learns to know the elements, learns to know God, himself, and nature, without which we cannot love God's omnipotence and benevolence. Who testifies more to God than Nature? Since we are created in God's image through these things we may learn to know our heavenly gifts, which we have received from our Creator in addition to our creation with which we may improve our knowledge as far as we need to in this life for knowledge of God and ourselves, and also in order to research nature. Therefore we should refrain from bickering, and what we do not understand we should neither praise nor blame, and so will our soul find peace and taste God's wisdom, since how may we know what we do not see, taste, nor feel? Or do we love that which we do not know? Is it thus not necessary to investigate the nature of the Elements? to get to know nature? and to love God? to whom alone honor will be in eternity. Take this here out of love and research nature, then you will become witnesses, and you will learn to understand what will follow hereafter, namely the greatest wonder that we see here through the nature of the elements. In praise and honor of our Saviour. Amen.