Ḥayy ibn Yaqẓān

Author: Ibn Tufayl a.k.a. Abubacer (before 1110 to 1185 C.E)

Rev. Simon Ockley, translator (1678-1720)

§ 1 Our virtuous ancestors (may God be gracious to them!) tell us, that there is an Indian island, situate under the Equinoctial, where men come into the world spontaneously without the help of father and mother. For this island enjoys the most equable and perfect temperature of all places on the Earth, because it receives its light from the highest possible point in the heavens; though it must be confessed that such an assertion is contrary to the opinion of the majority of philosophers and the most celebrated physicians, who affirm that the fourth clime has the most equable temperature of all inhabited regions. Now if they say this because they are convinced that there are no inhabited regions under the Equinoctial, by reason of some terrestrial impediment, their assertion that the fourth clime is the most equable of all places on the rest of the earth would have some appearance of reason. But if their reason be, because of the intense heat of those lands situate under the Equinoctial (which is that which most of them assign) it is absolutely false, and the contrary is proved by undeniable demonstration. For it is demonstrated in Natural Philosophy, that there is no other cause of heat than motion, or else the contact of hot bodies, or light. It is also proved that the Sun, in itself, is not hot, nor partakes of any quality of temperature: it is proved moreover, that the opaque and polished bodies receive light in the greatest degree of perfection; and next to them, the opaque which are not polished, and those which are entirely without opacity receive no light at all. (This was first demonstrated by Avicenna, never mentioned before by any of the Ancients.) From these premises, this consequence will necessarily follow, viz. that the Sun does not communicate his heat to the Earth, after the same manner as hot bodies heat those other bodies which are near them; because the Sun is not hot in itself. Nor can it be said that the Earth is heated by motion, because it stands still, and remains in the same posture, both when the Sun shines upon it, and when it does not, and yet it is evident to sense that there is a vast difference in it, in respect of heat and cold, at those several times. Nor does the Sun first heat the air, and so the Earth; because we may observe in hot weather, that the air which is nearest the Earth is hotter by much than that which is higher and more remote. It remains therefore that the Sun has no other way of heating the Earth but by its light, for heat always follows light, so that when its beams are collected, as in burning-glasses for instance, it fires all before it. Now it is established in the exact sciences by precise demonstration, that the Sun is a spherical body, and so is the Earth; and that the Sun is much greater than the Earth; and that part of the Earth which is at all times illuminated by the Sun is above half of it; and that in that half which is illuminated, the light is most intense in the midst, both because that part is the most remote from darkness, as also, because it offers a greater surface to the Sun; and that those parts which are nearer the circumference of the circle, have less light; and so gradually, till the circumference of the circle, which encompasses the illuminated part of the Earth, ends in darkness.

§ 2 Now that is the center of the circle of light, where the Sun is vertical to the inhabitants, and then in that place the heat is most extremely intense; and so those countries are the coldest, where the Sun is farthest from being vertical. And if there were any such place where the Sun was always vertical, it must needs be extreme hot. Now it is demonstrated in astronomy, that the Sun is vertical twice a year only, to those which live under the Equinoctial, viz. when he enters into Aries and Libra; and all the rest of the year he declines from them, six months northward, and six months southward; and for that reason they are neither too hot nor too cold, but of a moderate temper between both. There's much more to be said about this argument, in order to the explaining it fully, but it is not suitable to our purpose; I have only hinted it to you, because it makes it something more probable that a man might in that region be formed without the help of father and mother; and there are some which affirm positively that Hayy Ibn Yaqzân was so, others deny it, and tell the story thus:

§ 3 They say, that there lay, not far from this our island, another great island very fertile and well peopled; which was then governed by a prince of a proud and jealous disposition: he had a sister of exquisite beauty, which he confined and restrained from marriage, because he could not match her to one suitable to her quality. He had a near relation whose name was Yaqzân, that married her privately, according to a rite of matrimony then in use among them: it was not long before she proved with child, and was brought to bed of a son; and being afraid that it should be discovered, she took him in the evening, and when she had suckled him she put him into a little ark which she closed up fast, and so conveys him to the sea shore, with some of her servants and friends as she could trust; and there with an heart equally affected with love and fear, she takes her last leave of him in these words: "O God, you formed this child out of nothing,(1) and did cherish him in the dark recesses of my womb, till he was complete in all his parts; I, fearing the cruelty of this proud and unjust king, commit him to thy goodness, hoping that thou who art infinitely merciful will be pleased to protect him, and never leave him destitute of thy care."

§ 4 Then she set him afloat, and that very night the strong tide carried him ashore on that island we just now mentioned. It fortuned that the water, being high, carried the ark a great way on shore, farther than it would have done at another time (for it rises so high but once a year) and cast the ark into a grove, thick set with trees, a pleasant place, shielded from wind and rain and veiled from the Sun, which could not penetrate there neither when it rose nor when it set.(2) When the tide ebbed, the ark was left there, and the wind rising blew an heap of sand together between the ark and the sea, sufficient to secure him from any future danger of such another flood.

§ 5 The nails and timbers of the ark had been loosened when the waves cast it into that thicket; the child being very hungry wept and cried for help and struggled. It happened that a roe which had lost her fawn, heard the child cry, and following the voice (imagining it to have been her fawn) came up to the ark, and what with her digging with her hoofs from

without, and the child's thrusting from within, at last between them both they burst open a board of the lid. Thereupon she was moved with pity and affection for him, and freely gave him suck; and she visited and tended him continually, protecting him from all harm. This is the account which they give of his origin, who are not willing to believe that a man can be produced without father or mother. We shall tell anon how he grew up and rose from one state to another, till at last he attained the state of highest perfection.

§ 6 On the other hand, those who affirm that Hayy Ibn Yaqzân was produced without father and mother, tell us, that in that island, in a piece of low ground, it chanced that a certain mass of earth was so fermented in some period of years, that the hot was so equally mixed with the cold, and the moist with the dry, that none of them prevailed over the other; and that this mass was of a very great bulk, in which, some parts were better and more equally tempered than others, and fitter to form the seminal humors; the middle part especially, which came nearest to the temper of man's body. This matter being in a fermentation, there arose some bubbles by reason of its viscousness, and it chanced that in the midst of it there was formed a very little bubble, which was divided into two with a thin partition, full of spirituous and aerial substance, and of the most exact temperature imaginable. The matter being thus disposed, there was, by the command of god, a spirit infused into it, which was joined so closely to it, that it can scarce be separated from it even so much as in thought. For this spirit emanates continually and abundantly from the most high and glorious God, and may be compared to the light of the Sun which is sent forth continually and abundantly over the world. Now there are some bodies from whence we perceive no reflection of this light, as the thin air: others from which we do but imperfectly; such are opaque bodies which are not polished (but there is a difference in these, and the difference of their colours arises from the different manner of their reception of the light); and others reflect the light in the highest degree, as bodies which are smooth and polished, such as looking-glasses and the like; so that those glasses when hollowed out after a particular manner will collect so much light as to produce fire. So that spirit which comes by the command of God, does at all times act upon all creatures, in some of which notwithstanding, there appears no impression of it, but the reason of that is because of their incapacity into whom it is infused; of which kind are things inanimate which are fitly represented in this similitude by the thin air. There is another sort again, in which there does appear something of it, as vegetables and the like, which are represented by the opaque bodies we mentioned, which are not polished. And then lastly, there are others, (represented by those polished bodies in our comparison) in which the influence of this spirit is very visible, and such we reckon all sorts of animals. Now, among those polished bodies, some besides having the eminent faculty of receiving the Sun's light, give an image resembling the Sun; so also among the animals, some not only have the eminent faculty of receiving the spirit, but resemble it and are formed in its image. Such is man particularly, and to him did the Prophet allude when he said, God created Adam in his own image.

§ 7 Now, when this image in Man prevails to such a degree that all others are nothing before it, but it remains alone, so as to consume, with the glory of its light, whatsoever

stands in its way; then it is properly compared to those glasses, which reflect light upon themselves, and burn everything else; but this is a degree which is peculiar to the Prophets (the blessing of God be upon them!).

§ 8 But to return, and finish the account of those who describe this kind of generation: they tell us, that as soon as this spirit was joined to the receptacle, all the other faculties immediately, by the command of God, submitted themselves to it. Now, opposite to this receptacle, there arose another bubble divided into three ventricles by thin membranes, with passages from one to the other, which were filled with an aerial substance, not much unlike that which was in the first receptacle, only something finer than the first; and in each of these three ventricles, which were all taken out of one, were placed some of those faculties, which were subject to this governing spirit, and were appointed to take care of their respective stations, and to communicate everything, both great and small, to that spirit, which, we told you before was placed in the first receptacle. Right against this first receptacle, and opposite to the second, there arose another third bubble, filled with an aerial substance, which as grosser than that which was in the other two. This receptacle was made for the entertainment of some other of the inferior faculties.

§ 9 Thus these three receptacles were made in the same order which we have described, and these were the first part of that great mass which was formed. Now they stood in need of one another's assistance; the first wanted the other two as servants, and they again the assistance and guidance of the first, as their master and director; but both these receptacles (the former of which had more authority than the latter), though inferior to the first, were nevertheless superior to all those organs which were formed afterwards. The first receptacle of all, by the power of that spirit which was joined to it and its continual flaming heat, was formed into a conical figure, like that of fire, and by this means that thick body, which was about it, became of the same figure, being solid flesh covered with a thick protecting membrane. The whole of this organ is what we call the heart. Now considering the great destruction and dissolution of humours, which must needs be where there is so much heat, it was absolutely necessary that there should be some part formed, whose office it should be continually to supply this defect; otherwise it would have been impossible to have subsisted long. It was also necessary that this forming spirit should have a sense both of what was convenient for him, and what was hurtful, and accordingly attract the one and repel the other. For these services there were two parts formed, with their respective faculties, viz. the brain and the liver: the first of these presided over all things relating to sense, the latter over such things as belonged to nutrition: both of these depended upon the heart for a supply of heat, and the recruiting of their proper faculties. To supply these divers needs, there were ducts and passages interwoven, some bigger, some lesser, according as necessity required; and these are the arteries and veins. Thus much for a taste; they that tell the story go on farther, and give you a particular account of the formation of all the parts, as the physicians do of the formation of the foetus in the womb, omitting nothing till he was completely formed, and just like an embryo ready for the birth. In this account they are forced to be beholding to this vast mass of fermented earth, which

you are to suppose contained in it all manner of materials proper for the making man's body, those skins which cover it &c.; till at last, when he was complete in all his parts, as if the mass had been in labour, those coverings, which he was wrapped up in, burst asunder, and the rest of the dirt dried and cracked in pieces. The infant being thus brought into the world, and finding his nourishment fail him, cried for want of victuals, till the roe which had lost her fawn heard him. Now, both those who are of the other opinion and those who are for this kind of generation, agree in all the other particulars of his education: and what they tell us is this.

§ 10 They say that this roe lived in good and abundant pasture so that she was fat, and had such plenty of milk, that she was very well able to maintain the little child; she stayed by him and never left him, but when hunger forced her; and he grew so well acquainted with her, that if at any time she staid away from him a little longer than ordinary, he would cry pitifully, and she, as soon as she heard him; came running instantly; besides all this, he enjoyed this happiness, that there was no beast of prey in the whole island.

§ 11 Thus he went on, living only upon what he sucked till he was two years old, and then he began to step a little and breed his teeth. He always followed the roe, and she showed all the tenderness to him imaginable; and used to carry him to places where fruit trees grew, and fed him with the ripest and sweetest fruits which fell from the trees; and if they had hard shells, she used to break them for him with her teeth; still suckling him, as often as he pleased, and when he was thirsty she showed him the way to the water. If the Sun shined too hot, she shaded him; if he was cold she cherished him and kept him warm; and when night came she brought him home to his old place, and covered him partly with her own body, and partly with some feathers taken from the ark, which had been put in with him when he was first exposed. Now, when they went out in the morning, and when they came home again at night, there always went with them an herd of deer, which lay in the same place where they did, so that the boy being always amongst them learned their voice by degrees, and imitated it so exactly that there was scarce any sensible difference; nay, when he heard the voice of any bird or beast, he would come very near it. But of all the voices which he imitated, he made most use of the deers', and could express himself as they do, either when they want help, call their mates, when they would have them come nearer, or go farther off. (for you must know that the brute beasts have different sounds to express these different things.) Thus he contracted such an acquaintance with the wild beasts, that they were not afraid of him, nor he of them.

§ 12 By this time he began to have the ideas of a great many things fixed in his mind, so as to have a desire to some, and an aversion to others, even when they were absent. In the meanwhile he considered all the several sorts of animals, and saw that they were all clothed either with hair, wool, or feathers; he considered their great swiftness and strength, and that they were all armed with weapons defensive, as horns, teeth, hoofs, spurs, and nails; but that he himself was naked and defenceless, slow and weak, in respect of them. For whenever there happened any controversy about gathering of fruits, he always

came off by the worst, for they could both keep their own, and take away his, and he could neither beat them off nor run away from them.

§ 13 He observed besides that his fellow-fawns, though their foreheads were smooth at first, yet afterwards had horns bud out, and though they were feeble at first, yet afterwards grew very vigorous and swift. All these things he perceived in them, which were not in himself; and when he had considered the matter, he could not imagine what should be the reason of this difference. Then he considered such animals as had any defect or natural imperfection, but amongst them all he could find none like himself. He took notice that the passages of the excrements were protected in all other creatures besides himself: that by which they voided their grosser excrements, with a tail; and that which served for the voiding of their urine, with hair or some such like thing. Besides, he observed that their genital organs were more concealed than his own were.

§ 14 All these things were matter of great grief to him, and when he had perplexed himself very much with the thoughts of them, and was now near seven years old, he despaired utterly of having those things grow upon him, the want of which made him so uneasy. He therefore got him some broad leaves of trees, of which he made two coverings, one to wear behind, the other before; and made a girdle of palm leaves and rushes, to hang his covering upon, and tied it about his waist. But alas it would not last long, for the leaves withered and dropt away; so that he was forced to get more, which he plaited in Layers one upon another, which made it a little more durable, but not much. Then having broke branches from a tree and fitted the ends of them to his mind, he stripped off the twigs and made them smooth; with these he began to attack the wild beasts, assaulting the weaker, and defending himself against the stronger. By this means he began a little to know his own powers, and perceived that his hands were better than their fore-feet; because by the help of them, he had provided wherewithal to cover his nakedness, and also gotten him a defensive weapon, so that now he had no need of a tail, nor of those natural weapons which he had so wished for at first.

§ 15 Meanwhile he was growing up and had passed his seventh year, and because the repairing of his covering of leaves so often, was very troublesome to him, he had a design of taking the tail of some dead beast, and wearing it himself; but when he perceived that all beasts did constantly avoid those which were dead of the same kind, it made him doubt whether it might be safe or not. At last, by chance he found a dead eagle, and observing that none of the beasts showed any aversion to that carcass, he concluded that this would suit his purpose: and in the first place, he cuts off the wings and the tail whole, and spreads the feathers open; then he drew off the skin, and divided it into two equal parts, one of which he wore upon his back, with the other he covered his navel and secrets: the tail he wore behind, and the wings were fixed upon each arm. This dress of his answered several ends; for in the first place it covered his nakedness, and kept him warm, and then it made him so frightful to the beasts, that none of them cared to meddle with him, or come near him; only the roe his nurse, which never left him, nor he, her; and when she grew old and feeble, he

used to lead her where there was the best pasture, and pluck the sweetest fruits for her, and give her them to eat.

§ 16 Notwithstanding this she grew lean and weak, and continued a while in a languishing condition, till at last she dyed, and then all her motions and actions ceased. When the boy perceived her in this condition, he was ready to dye for grief. He called her with the same voice which she used to answer to, and made what noise he could, but there was no motion, no alteration. Then he began to peep into her ears and eyes, but could perceive no visible defect in either; in like manner he examined all the parts of her Body, and found nothing amiss, but every thing as it should be. He had a vehement desire to find that part where the defect was, that he might remove it, and she return to her former state. But he was altogether at a loss how to compass his design, nor could he possibly bring it about.

§ 17 That which put him upon this search, was what he had observed in himself. He had noticed that when he shut his eyes, or held anything before them, he could see nothing at all, till that obstacle was removed; and so when he put his fingers into his ears, that he could not hear, till he took them out again; and when he closed his nostrils together, he smelt nothing till they were opened; from whence he concluded that all his perceptive and active faculties were liable to impediments, upon the removal of which, their operations returned to their former course. Therefore, when he had examined every external part of her, and found no visible defect and yet at the same time perceived an universal cessation of motion in the whole body, not peculiar to one member but common to them all, he began to imagine that the hurt was in some organ which was remote from the sight and hidden in the inward part of the body; and that this organ was of such nature and use, that without its help, none of the other external organs could exercise their proper functions; and that if this organ suffer any hurt, the damage was general, and a cessation of the whole ensued.

§ 18 This made him very desirous to find that organ if possible, that he might remove the defect from it, that so it might be as it used to be, and the whole body might enjoy the benefit of it, and the functions return to their former course. He had before observed, in the bodies of wild beasts and other animals, that all their members were solid, and that there were only three cavities, viz. the skull, the breast, and the belly; he imagined therefore that this organ which he wanted must needs be in one of these cavities, and above all, he had a strong persuasion that it was in the middlemost of them. For he verily believed that all the members stood in need of this organ, and that from thence it must necessarily follow that the seat of it must be in the centre. And when he reflected upon his own body, he felt the presence of such an organ in his breast. Now since he was able to hinder the action of all his other organs, such as hands, feet, ears, nose and eyes, and deprive himself of it, he conceived that it might be possible to subsist without them; but when he considered this organ within his breast he could not conceive the possibility of subsisting without it, so much as the twinkling of an eye. And upon this account, whenever he fought with any wild beast, he always took particular care to protect his breast from being pierced by its horns, because of the apprehension which he had of that organ which was contained in it.

§ 19 Having, by this way of reasoning, assured himself that the disaffected organ lay in the breast; he was resolved to make a search in order to examine it, that whatsoever the impediment was, he might remove it if possible; but then again, he was afraid on the other side, lest his undertaking should be worse than the disease, and prove prejudicial. He began to consider next, whether or no he had ever remembered any wild beasts or other animals which he had seen in that condition, recover again, and return to the same state which they were in before, but he could call to mind no such instance; from whence he concluded that if she was let alone there would be no hopes at all, but if he should be so fortunate as to find that organ and remove the impediment, there might be some hope. Upon this he resolved to open her breast and make enquiry; in order to which he provided himself with fragments of flint, and splinters of dry cane almost like knives, with which he made an incision between the ribs, and cutting through the flesh, came to the diaphragma; which he finding very tough, assured himself that such a covering must needs belong to that organ which he looked for, and that if he could once get through that, he should find it. He met with some difficulty in his work, because his instruments were none of the best, for he had none but such as were made either of flint or cane.

§ 20 However, he sharpened them again and renewed his attempt with all the skill he was master of. At last he broke through, and the first part he met with was the lungs, which he at first sight mistook for that which he searched for, and turned them about this way and that way to see if he could find in them the seat of the disease. He first happened upon that lobe which lay next the side which he had opened and when he perceived that it did lean sideways, he was satisfied that it was not the organ he looked for, because he was fully persuaded that that must needs be in the midst of the body, as well in regard of latitude as longitude. He proceeded in his search, till at last he found the heart, which when he saw closed with a very strong cover, and fastened with stout ligaments, and covered by the lungs on that side which he had opened, he began to say to himself: “If this organ be so on the other side as it is on this which I have opened, then it is certainly in the midst, and without doubt the same I look for; especially considering the convenience of the situation, the comeliness and regularity of its figure, the firmness of the flesh, and besides, its being guarded with such a membrane as I have not observed in any other part.” Upon this he searches the other side, and finding the same membrane on the inside of the ribs, and the lungs in the same posture which he had observed on that side which he had opened first, he concluded this organ to be the part which he looked for.

§ 21 Therefore he first attacks the pericardium, which, after a long trial and a great deal of pains, he made shift to tear; and when he had laid the heart bare, and perceived that it was solid on every side, he began to examine it, to see if he could find any apparent hurt in it; but finding none, he squeezed it with his hand, and perceived that it was hollow. He began then to think that what he looked for might possibly be contained in that cavity. When he came to open it, he found in it two cavities, one on the right side, the other on the left. That on the right side was full of clotted blood, that on the left quite empty. “Then (says he) without all doubt, one of those two cavities must needs be the receptacle of what I look for;

as for that on this right side there's nothing in it but congealed blood, which was not so, be sure, till the whole body was in that condition in which it now is" (for he had observed that all blood congeals when it flows from the body). "This blood does not differ in the least from any other; and I find it common to all the organs. What I look for cannot by any means be such a matter as this; for that which I seek is something which is peculiar to this place, which I find I could not subsist without, so much as the twinkling of an eye. And this is that which I looked for at first. As for this blood, how often have I lost a great deal of it in my skirmishes with the wild beasts, and yet it never did me any considerable harm, nor rendered me incapable of performing any action of life, and therefore what I look for is not in this cavity. Now as for the cavity on the left side, I find it is altogether empty, and I have no reason in the world to think that it was made in vain, because I find every organ appointed for such and such particular functions. How then can this ventricle of the heart, which I see is of so excellent a frame, serve for no use at all? I cannot think but that the same thing which I am in search of, once dwelt here, but has now deserted his habitation and left it empty, and that the absence of that thing has occasioned this privation of sense and cessation of motion which happened to the body." Now when he perceived that the being which had inhabited there before had left its house before it fell to ruin, and forsaken it when as yet it continued whole and entire, he concluded that it was highly probable that it would never return to it any more, after its being so cut and mangled.

§ 22 Upon this the whole body seemed to him a very inconsiderable thing, and worth nothing in respect of that being he believed once inhabited, and now had left it. Therefore he applied himself wholly to the consideration of that being. What it was and how it subsisted? What joined it to this body? Whither it went, and by what passage, when it left the body? What was the cause of its departure, whether it were forced to leave its mansion, or left the body of its own accord? And in case it went away voluntarily, what it was that rendered the body so disagreeable to it, as to make it forsake it? And whilst he was perplexed with such variety of thoughts, he laid aside all concern for the carcass, and banished it from his mind; for now he perceived that his mother, which had nursed him so tenderly and had suckled him, was that something which was departed; and from it proceeded all her actions, and not from this inactive body; but that all this body was to it only as an instrument, like his cudgel which he had made for himself, with which he used to fight with the wild beasts. So that now, all his regard to the body was removed, and transferred to that by which the body is governed, and by whose power it moves. Nor had he any other desire but to make enquiry after that.

§ 23 In the meantime the carcass of the roe began to putrefy and emit noisome vapours, which still increased his aversion to it, so that he did not care to see it. It was not long after that he chanced to see two ravens engaged so furiously, that one of them struck down the other stark dead; and when he had done, he began to scrape with his claws till he had dug a pit, in which he buried the carcass of his adversary. The boy observing this, said to himself: "How well has this raven done in burying the body of his companion, though he did ill in killing him! How much greater reason was there for me to have been forward in

performing this office to my mother?" Upon this he digs a pit, and lays the body of his mother into it, and buries her. He proceeded in his enquiry concerning what that should be by which the body was governed, but could not apprehend what it was. When he looked upon the rest of the roes and perceived that they were of the same form and figure with his mother, he could not resist the belief that there was in every one of them something which moved and directed them, like that which had moved and directed his mother formerly; and for the sake of that likeness he used to keep in their company and show affection towards them. He continued a while in this condition, contemplating the various kinds of animals and plants, and walking about the coast of his island, to see if he could find any being like himself (as he observed that every individual animal and plant had a great many more like it). But all his search was in vain. And when he perceived that his island was encompassed by the sea, he thought that there was no other land in the world but only that island.

§ 24 It happened that by friction a fire was kindled among a thicket of canes, which scared him at first, as being a sight which he was altogether a stranger to, so that he stood at a distance a good while, strangely surprised. At last he came nearer and nearer by degrees, still observing the brightness of its light and marvellous efficacy in consuming every thing it touched and changing it into its own nature; till at last his admiration of it and that innate boldness and fortitude which God had implanted in his nature prompted him on, that he stretched out his hand to take some of it. But when it burnt his fingers and he found there was no dealing with it that way, he thought to take a stick which the fire had not as yet wholly seized upon; so taking hold on that end which was untouched he easily gained his purpose, and carried it home to his lodging (for he had found a cave which served as a convenient abode). There he kept this fire and added fuel to it, of dry grass and wood, admired it wonderfully, and tended it night and day; at night especially, because its light and heat supplied the absence of the Sun; so that he was extremely delighted with it and reckoned it the most excellent of all those things which he had about him. And when he observed that it always moved upwards, he persuaded himself that it was one of those celestial substances which he saw shining in the firmament, and he was continually trying of its power, by throwing all manner of things into it, which he perceived it always vanquished, sometimes sooner, sometimes slower, according as the bodies which he put into it were more or less combustible.

§ 25 Amongst other things which he put in to try its strength, he once flung in some sea animals which had been thrown ashore by the water, and as soon as ever he smelt the steam, it raised his appetite, so that he had a mind to taste of them; which he did, and found them very agreeable, and from that time he began to use himself to the eating of flesh, and applied himself to fishing and hunting till he understood those sports very well: upon this account he admired his fire more and more, because it helped him to several sorts of excellent provision which he was altogether unacquainted with before.

§ 26 And now when his affection towards it was increased to the highest degree, both upon the account of its beneficial effects and its extraordinary power, he began to think that the

substance which was departed from the heart of his mother the roe, was, if not the very same with it, yet at least of a nature very much like it. He was confirmed in his opinion because he had observed in all animals, that as long as they lived, they were constantly warm without any intermission, and as constantly cold after death. Besides he found in himself, that there was a greater degree of heat by much in his breast, near that place where he had made the incision in the roe. This made him think that if he could dissect any animal alive, and look into that ventricle which he had found empty when he dissected his dam the roe, he might possibly find it full of that substance which inhabited it, and so inform himself whether it were of the same substance with the fire, and whether it had any light and heat in it or not. In order to this he took a wild beast and tied him down, and dissected him after the same manner he had dissected the roe, till he came to the heart; and essaying the left ventricle first, and opening it, he perceived it was full of an airy vapour which looked like a little mist or white cloud, and putting in his finger, he found it hotter than he could well endure it, and immediately the creature dyed. From whence he assuredly concluded that it was that hot vapour which communicated motion to that animal, and that there was accordingly in every animal of what kind soever, something like it upon the departure of which death followed.

§ 27 He was then moved by a great desire to enquire into the other parts of animals, to find out their order and situation, their quantity and the manner of their connexion one with another and by what means of communication they enjoy the benefit of that hot vapour, so as to live by it, how that vapour is continued the time it remains, from whence it has its supplies, and by what means its heat is preserved. The way which he used in this enquiry was the dissection of all sorts of animals, as well living as dead, neither did he leave off to make an accurate enquiry into them, till at length he arrived to the highest degree of knowledge in this kind which the most learned naturalists ever attained to.

§ 28 And now he apprehended plainly that every particular animal, though it had a great many limbs, and variety of senses and motions, was nevertheless one in respect of that spirit, whose original was from one firm mansion, viz. the heart, from whence its influence was diffused among all the members, which were merely its servants or instruments. And that this spirit made use of the body in the same manner as he himself did of his weapons; with some he fought with wild beasts, with others captured them, and with others cut them up; the first kind of weapons were either defensive or offensive; the second kind for the capture either of land or water animals; the third, his dissecting instruments, were some for fission, others for fraction, and others for perforation. His body, which was one, wielded those diverse instruments according to the respective uses of each, and the several ends which it proposed to obtain.

§ 29 Likewise he perceived that this animal spirit was one, whose action when it made use of the eye, was sight; when of the ear, hearing; when of the nose, smelling; when of the tongue, tasting; and when of the skin and flesh, feeling. When it employed any limb, then its operation was motion; and when it made use of the liver, nutrition and concoction. And that though there were members fitted to every one of these uses, yet none of them could

perform their respective offices without having correspondence with that spirit by means of passages called nerves; and that if at any time it chanced that these passages were either broken off or obstructed, the action of the corresponding member would cease. Now these nerves derive this spirit from the cavities of the brain, which has it from the heart (and contains abundance of spirit, because it is divided into a great many partitions) and by what means soever any limb is deprived of this spirit, its action ceases and it is like a cast off tool, not fit for use. And if this spirit depart wholly from the body, or is consumed or dissolved by any means whatsoever, then the whole body is deprived of motion and reduced to that state which is death.

§ 30 Thus far had his observations brought him about the end of the third seventh year of his age, viz. when he was one and twenty years old. In which time he had made abundance of pretty contrivances. He made himself both clothes and shoes of the skins of such wild beasts as he had dissected. His thread was made of hair, and of the bark of the stalks of althwa, mallows, or hemp, or any other plants which afforded such strings as were fit for that purpose. He learned the making of these threads from the use which he had made of the rushes, before. He made awls of sharp thorns, and splinters of cane sharpened with flints. He learned the art of building from the observations he made upon the swallows' nests. He had built himself a store-house and a pantry, to lay up the remainder of his provision in, and made a door to it of canes bound together, to prevent any of the beasts getting in during his absence. He took birds of prey and brought them up to help him in his hunting, and kept tame poultry for their eggs and chickens. He took the tips of the buffalo’s horns and fastened them upon the strongest canes he could get, and staves of the tree al-Zân and others; and so, partly by the help of the fire, and partly of sharp edged stones, he so fitted them that they served him instead of so many spears. He made him a shield of hides folded together. All this pains he took to furnish himself with artificial weapons, because he found himself destitute of natural ones.

§ 31 Now when he perceived that his hand supplied all these defects very well, and that none of all the various kinds of wild beasts durst stand against him, but ran away from him and were too nimble for him, he began to contrive how to be even with them, and thought there would be no way so proper as to chose out some of the swiftest beasts of the island, and bring them up tame, and feed them with proper food, till they would let him back them and then he might pursue the other kinds of Wild beasts. There were in that island both wild horses and asses; he chose of both sorts such as seemed fittest for his purpose, and by training he made them wholly obedient to his Wishes. And when he had made out of strips of skin and the hides of beasts such things as served him competently well in the room of bridles and saddles, he could very easily then overtake such beasts as he could scarce ever have been able to have caught any other manner of way. He made all these discoveries whilst he was employed in the study of anatomy, and the searching out of the properties peculiar to each partb, and the difference between them; and all this before the end of that time I speak of, viz. of the age of 21 years.

§ 32 He then proceeded further to examine the nature of bodies in this world of generation and corruption, viz. the different kinds of animals, plants, minerals, and the several sorts of stones, and earth, water, vapour, ice, snow, hail, smoke, flame, and glowing heat; in which he observed many qualities and different actions, and that their motions agreed in some respects, and differed in others. And considering these things with great application, he perceived that their qualities also agreed in some things, and differed in others; and that so far as they agreed, they were one; but when considered with relation to their differences, a great many: so that when he came to consider the properties of things by which they were distinguished one from another, he found that they were innumerable and existence seemed to multiply itself beyond his comprehension. Nay, when he considered the difference of his own organs, which he perceived were all distinct from one another by some property and action peculiar to each, it seemed to him that there was a plurality in himself. And when he regarded any one organ, he found that it might be divided into a great many parts, from whence he concluded, that there must needs be a plurality not only in himself but in every other thing also.

§ 33 Then viewing the matter from another side, he perceived that though his organs were many, yet they were conjoined and compacted together so as to make one Whole, and that what difference there was between them consisted only in the difference of their actions, which diversity proceeded from the power of that animal spirit, the nature of which he had before searched into and found out. Now he remembered that that spirit was one in essence, and the true essence, and that all the organs serve that spirit as instruments; and so, viewing the matter from this side, he perceived himself to be one.

§ 34 He proceeded from hence to the consideration of all the species of animals and found that every individual of them was one. Next he considered them with regard to their different species, viz. as roes, horses, asses and all sorts of birds according to their kinds, and he perceived that all the individuals of every species were exactly like one another in the shape of their organs, both within and without, that their apprehensions, motions, and inclinations were alike, and that those little differences which were visible amongst them were inconsiderable in respect of those many things in which they agreed. From whence he concluded that the spirit which actuated any species was one and the same, only distributed among so many hearts as there were individuals in that species; so that if it were possible for all that spirit which is so divided among so many hearts to be collected into one receptacle, it would be all the same thing, just as if any one liquor should be poured out into several dishes and afterwards put all together again in one Vessel, this liquor would still be the same, as well when it was divided as when it was altogether, only in respect of that division it may be said in some sort to be multiplied. By this way of contemplation he perceived that a whole species was one and the same thing, and that the multiplicity of individuals in the same species is like the multiplicity of parts in the same person, which indeed is not a real multiplicity.

§ 35 Then he represented in his mind all the several kinds of animals, and perceived that sensation, and nutrition, and the power of moving freely where they pleased, were

common to them all; which actions he was assured before, were all very proper to the animal spirit, and that those lesser things in which they differed (notwithstanding their agreement in these greater) were not so proper to that spirit. From this consideration he concluded that it was only one and the same animal spirit which actuated all living creatures whatsoever, though there was in it a little difference which each species claimed as peculiar to itself. For instance, suppose the same water be poured out into different vessels, that which is in this vessel may possibly be something colder than that which is in another, though it is the same Water still, and so all the portions of this water which are at the same degree of cold will represent the peculiar state of the animal spirit which is in all the animals of one species. And as that water is all one and the same, so is that animal spirit one, though there has occurred in it an accidental multiplicity. And so under this notion he looked upon the whole animal kingdom to be all One.

§ 36 Afterwards Contemplating the different Species of Plants, he perceived that the Individuals of every Species were alike, both in their Boughs, Leaves, Flowers, Fruits, and manner of Growing. And comparing them with Animals he found that there must needs be some one thing which they did all of them partake of, which was the same to them that the Animal Spirit was to the living Creature, and that in respect of That they were all One. Whereupon, taking a view of the Vegetable Kingdom, he concluded that it was One, by reason of that Agreement which he found in the Functions of Plants, viz. their Nourishment and Growing.

§ 37 Then he associated in his mind, the kingdoms of animals and plants together, and found that they were both alike in their nutrition and growing, only the animals excelled the plants in sensation and apprehension and movement, and yet he had sometimes observed something like it in plants, viz. that some flowers do turn themselves towards the sun, and that the plants extend their roots that way the nourishment comes, and some other such like things. From whence it appeared to him that plants and animals were one and the same, in respect of that one thing which was common to them both; which was indeed more perfect in the one, and more obstructed and restrained in the other; like water that is partly running and partly frozen. So that he concluded that plants and animals were all one.

§ 38 He next considered those bodies which have neither sense, nutrition nor growth, such as stones, earth, water, air, and flame, which he perceived had all of them three dimensions, viz. length, breadth, and thickness, and that their differences consisted only in this, that some of them were Coloured, others not, some were warm, others cold, and the like. He observed that those bodies which were Warm grew cold, and on the contrary, that those which were cold grew warm. He saw that water was rarefied into vapour, and vapour again condensed into water; and that such things as were burnt were turned into coals, ashes, flame and smoke, and if in its ascent smoke were intercepted by an arch of stone, it thickened there and became like certain earthy substances. From whence it appeared to him that all these things were in reality one, though multiplied and diversified accidentally as the plants and animals were.

§ 39 Then considering with himself what that thing must be which constituted the unity of plants and animals, he saw that it must be some body, like those bodies, which had a threefold dimension, viz. length, breadth, and thickness; and that whether it were hot or cold, it was like any of those other bodies which have neither sense nor nutrition, and differed from them only in those acts which proceeded from it by means of animal or vegetable organs. And that perchance those acts were not essential, but derived from something else, so that if those acts were to be produced in those other bodies, they would be like this body. Considering it therefore abstractedly, with regard to its essence only, as stripped of those acts which at first sight seemed to emanate from it, he perceived that it was a body, of the same kind, with those other bodies; upon which contemplation it appeared to him that, all bodies, as well those that had life, as those that had not, as well those that moved, as those that rested in their natural places were one; only there were some from which acts proceeded by means of organs; concerning which acts he could not yet determine whether they were essential, or derived from something without. Thus he continued, considering nothing but the nature of bodies, and by this means he perceived that whereas at first sight, things had appeared to him innumerable and not to be comprehended; Now, he discovered the whole mass and bulk of creatures were in reality only one.

§ 40 He continued in this State a considerable time. Then he considered all sorts of bodies, both animate and inanimate, which one while seemed to him to be One; and another, a great many. And he found that all of them had a tendency either upward, as smoke, flame, and air when detained under water; or else downward, as water, pieces of earth, or parts of animals and plants; and that none of these bodies were free from one or other of these tendencies, or would ever lie still unless hindered by some other body, and interrupted in their course; as when, for instance, a stone in its fall is stopped by the solidity and hardness of the Earth, when it is plain it would otherwise continue still descending; and if you lift it, you feel that it presses upon you by its tendency toward the lower place to which it seeks to descend. So smoke still continues going upwards, and if it should be intercepted by a solid arch, it would divide both to the right and left, and so soon as it was freed from the arch, would still continue ascending and pass through the air, which is not solid enough to restrain it. He perceived also that when a leathern bottle is filled with air and its neck tightly bound, if you hold it under Water it will still strive to get up till it returns to its place of air, and then it rests, and its resistance and its propensity to ascend ceases.

§ 41 He then enquired whether or no he could find any body that was at any time destitute of both these motions, or a tendency toward them, but he could find none such among all bodies which he had about him. The reason of this enquiry was, because he was very desirous to know the nature of body, as such, abstracted from all manner of properties, from whence arises multiplicity. But when he found this too difficult a task for him, and he had examined those bodies which had the fewest properties, and could find none of them void of one of these two, viz. Heaviness or lightness; he proceeded to consider the nature of these two properties, and to examine whether they did belong to body quatenus body, or

else by reason of some property superadded to corporeity. It seemed to him that gravity and levity did not belong to body as such; for if so, then no body could subsist without them both: whereas on the contrary, we find that the heavy bodies are void of all lightness and the light bodies are void of all heaviness. Without doubt they are two Sorts of bodies, and each possesses an attribute which distinguishes it from the other, and which is superadded to its corporeity, otherwise they would be both one and the same thing, in every respect. From whence it appeared plainly that the essence both of an heavy and light body was composed of two attributes; one, which was common to them both, viz. corporeity; the other, by which they are distinguished one from the other, viz. gravity in the one, and levity in the other, which were superadded to corporeity.

§ 42 In like manner he considered other bodies, both animate and inanimate) and found their essence was composed of corporeity, and some thing or more superadded to it. And thus he attained a notion of the forms of bodies, according to their differences. these were the first things he found out, belonging to the spiritual world; for these forms are not the objects of sense, but are apprehended by intellectual speculation. Now among other things of this kind which he discovered, it appeared to him that the animal spirit which is lodged in the heart (as we have mentioned before) must necessarily have some attribute superadded to its corporeity, which rendered it capable of those wonderful actions, different sensations and ways of apprehending things, and various sorts of motions; and that this attribute must be its form, by which it is distinguished from other Bodies, which is the same that the philosophers call the animal soul. And so in plants, that which was in them the same that natural heat was in beasts, must have something proper to it, which was its form, which the philosophers call the vegetative soul And that there was also in inanimate things (viz. all rocks, besides plants and animals, which are in this sublunary world) something peculiar to them, by the power of which every one of them performed such actions as were proper to it, the form of every one of them, and this is the same which the philosophers call Nature.

§ 43 And when by this contemplation it appeared to him plainly that the true essence of that animal spirit on which he had been so intent, was compounded of corporeity and some other attribute superadded to that corporeity, and that it had its corporeity in common with other bodies; but that this other attribute which was superadded was peculiar to itself: immediately he despised and rejected the notion of corporeity, and applied himself wholly to that other superadded attribute (which is the same that we call the soul) the nature of which he earnestly desired to know. Therefore he fixed all his thoughts upon it, and began his contemplation with considering all bodies, not as bodies, but as endued with forms, from whence necessarily flow these properties by which they are distinguished one from another.

§ 44 Now by following up this notion and comprehending it in his mind, he perceived that all the bodies of a certain category had one form in common, from whence one or more actions did proceed. And that there was in this category a class whose members, though they agreed with all the rest in that one common form, had another form besides

superadded to it, from whence some actions proceeded. And further, that there was in this class a group, which agreeing with the rest in those two forms which they had, was still distinguished from them by a third form, superadded to those other two, from whence also proceeded some actions. For instance, all terrestrial bodies, as earth, stones, minerals, plants, animals, and all other heavy bodies, do make up one category, and possess in common the same form, from whence flows downward movement, whilst there is nothing to hinder their descent; and whensoever they are forced to move upwards, if they are left to themselves, they immediately by virtue of their form tend downwards again. Now a class of this category, viz. plants and animals, though they do agree with all that multitude before mentioned, in that form, yet still have another form superadded to it, from whence flow nutrition and accretion. Now the meaning of nutrition is, when the body that is nourished, substitutes in the room of that which is consumed and wasted from itself, something of the like kind, which it draws to itself, and then converts into its own substance. Accretion, or growing, is a motion according to the three dimensions, viz. length, breadth, and thickness in a due proportion. And these two actions are common to plants and animals, and do without doubt spring from that form which is common to them both, which is what we call the vegetative soul. Now a group of this class, viz. animals, though they have the first and second Forms in common with the rest, have still a third form superadded, from which arise sensations and local motion. Besides, he perceived that every particular species of animals had some property which distinguished it and made it quite different from the rest, and he knew that this difference must arise from some form peculiar to that species, which was superadded to the notion of that form which it had in common with the rest of animals. And the like he saw happened to the several kinds of plants.

§ 45 And it was evident to him that the essences of those sensible bodies, which are in this sublunary world, had some of them more attributes superadded to their corporeity, and others, fewer. Now he knew that the Understanding of the fewer must needs be more easy to him than the understanding of those which were more in number. And therefore he endeavoured to get a true notion of the essence of some one thing which had the fewest essential attributes. Now he perceived that the essences of animals and plants were composed of a great many attributes, because of the great variety of their actions; for which reason he deferred the enquiring into their forms. As for the parts of the Earth, he saw that some of them were more simple than others, and therefore resolved to begin his enquiry with the most simple of all. So he perceived that Water was a thing far from complex, which appeared from the paucity of those actions which arise from its form. The same he likewise observed in the fire and air.

§ 46 Now he had already perceived that all these four might be changed one into another; and that there must be some one thing which they jointly participated of, and that this thing was corporeity. Now it was necessary that this one thing which was common to them all should be altogether free from those attributes by which these four were distinguished one from the other, and be neither heavy nor light; hot nor cold; moist nor dry; because none of these qualities were common to all bodies, and therefore could not appertain to

body as such. And that if it were possible to find any such body, in which there was no other form superadded to corporeity, it would have none of these qualities, nor indeed any other but what were common to all bodies, with what form soever endued. He considered therefore with himself, to see if he could find any one adjunct or property which was common to all bodies, both animate and inanimate; but he found nothing of that nature, but only the notion of extension, and that he perceived was common to all bodies, viz. that they had all of them length, breadth, and thickness. Whence he gathered, that this notion belonged to body, as body. However, his sense could not represent to him any body existent in Nature, which had this only property, and was void of all other forms: For he saw that every one of them had some other notion superadded to the said extension.

§ 47 Then he considered further, whether this three-fold extension was the very Notion of Body, without the addition of another Notion; and quickly found that behind this Extension there was another Notion, in which this Extension did exist, and that Extension could not subsist by itself, as also the thing which was extended could not subsist by itself without extension. This he experimented in some of those sensible bodies which are endued with forms; for example, in clay: which he perceived, when moulded into any figure, (spherical suppose) had in it a certain proportion, length, breadth, and thickness. But then if you took that very same ball, and reduced it into a cubical or oval figure, the dimensions were changed, and did not retain the same proportion which they had before, and yet the clay still remained the same, without any change, only that it must always have a length, breadth, and thickness, in some proportion or other, and could not be deprived of these dimensions: Yet it was plain to him from the successive alterations of them in the same body, that they constituted a notion distinct from the clay itself; as also, that because the clay could not be altogether without them, it appeared to him that they belonged to its essence. And thus from this consideration it appeared to him that body regarded as body, was composed in reality of two notions: The one of which represents the clay, of which the sphere was made; the other, the threefold extension of it, when formed into a sphere, cube, or what other figure soever. Nor was it possible to conceive body, but as consisting of these two notions, neither of which could subsist without the other. But that one, (namely, that of extension) which was liable to change and could successively put on different figures, did represent the form in all those bodies which had forms. And that other which still abode in the same state, (which corresponded to the clay, in our last Instance) did represent the notion of corporeity, which is in all bodies, of what forms soever. Now that thing which is represented by clay in the foregoing instance, is the same which the philosophers call matter, which is wholly destitute of all manner of forms.

§ 48 When his contemplation hid proceeded thus far, and he was got to some distance from sensible objects, and was now just upon the confines of the intellectual world, he was diffident, and inclined rather to the sensible world, which he was more used to. Therefore he retreated a little and left the consideration of abstracted body (since he found that his senses could by no means reach it, neither could he comprehend it) and applied himself to the consideration of the most simple sensible bodies he could find, which were those four

about which he had been exercised. And first of all he considered the water, which he found, if let alone in that condition which its form required, had these two things in it, viz. sensible cold, and a propension to move downwards: But if heated by the fire or the sun, its coldness was removed, but its propension to move downwards still remained: But afterwards, when it came to be more vehemently heated, it lost its tendency downwards, and mounted upwards; and so it was wholly deprived of both those properties which used constantly to emanate from its form. Nor did he know any thing more of its form, but only that these two actions proceeded from thence; and when these two ceased, the nature of the form was altered, and the watery form was removed from that body, as soon as it manifested actions whose nature is to emanate from another form; and it received another form which had not been there before, from which arose those actions, which never used to appear in it whilst it had the first form.

§ 49 Now he knew that every thing that was produced anew must needs have some producer. And from this contemplation, there arose in his mind a sort of impression of the maker of that form, though his notion of him as yet was general and indistinct. Then he paused on the examining of these forms which he knew before, one by one, and found that they were produced anew, and that they must of necessity be beholden to some efficient cause. Then he considered the essences of forms, and found that they were nothing else, but only a disposition of body to produce such or such actions. For instance, water, when very much heated, is disposed to rise upwards, and that disposition is its form. For there is nothing present in all this, but a body, and some things which are observed to arise from it, which were not in it before (such as qualities and motions) and an efficient cause which produces them. And the fitness of a body for one motion rather than another, is its disposition and form. The same he concluded of all other forms, and it appeared to him that those actions which emanated from them were not in reality owing to them, but to the efficient cause which produced in them those actions which are attributed to them. Which notion of his is exactly the same with what the apostle of God says (may God bless him and grant him peace!): I am his Hearing by which he hears, and his seeing by which he sees; and in the Clear Book of Revelation: You did not kill them, but God killed them; when you threw the darts, it was not you that threw them, but God.(3)

§ 50 Now, when he had attained thus far, so as to have a general and indistinct notion of this agent, he had a most earnest desire to know it distinctly. And because he had not as yet withdrawn himself from the sensible world, he began to look for this agent among sensible things; nor did he as yet know whether it was one agent or many. Therefore he enquired strictly into all such bodies as he had about him, viz. those which he had been employed about all along, and he found that they were all liable to generation and corruption. And if there were any which did not suffer a total corruption, yet they were liable to a partial one, as water and earth, the parts of which, he observed, were consumed by fire. Likewise among all the rest of the bodies which he was conversant with, he could find none which were not produced anew and therefore dependent upon some agent. Upon which account he laid them all aside, and transferred his thoughts to the consideration of the heavenly

bodies. And thus far he reached in his contemplations, about the end of the fourth septenary of his age, viz. when he was now eight and twenty years old.

§ 51 Now he knew very well that the heavens, and all the luminaries in them, were bodies, because they were all extended according to the three dimensions, length, breadth and thickness, without any exception; and that every thing that was so extended, was body; ergo, they were all bodies. Then he considered next, whether they were extended infinitely, as to stretch themselves to an endless length, breadth and thickness; or, whether they were circumscribed by any limits, and terminated by some certain bounds beyond which there could be no extension. But here he stopped a while, as in a kind of amazement.

§ 52 At last, by the strength of his apprehension and sagacity of his understanding, he perceived that the notion of infinite body was absurd and impossible, and a notion wholly unintelligible. He confirmed himself in this judgment of his by a great many arguments which occurred to him, and he thus argued with himself: That this heavenly body is terminated on this side which is next to me, is evident to my sight; and that it cannot be infinitely extended on that opposite side, which raised this scruple in me, I prove thus. Suppose two lines drawn from the extremity of this heavenly body, on that terminated side which is next to me, which lines should be produced quite through this body, in infinitum, according to the extension of the body; then suppose a long part of one of these lines cut off at this end which is next to me; then take the remainder of what was cut off, and draw down that end of it where it was cut off, and lay it even with the end of the other line from which there was nothing cut off; and let that line which was shortened lie parallel with the other; then follow these two lines in the direction in which we supposed them to be infinite. Either you will find both these lines infinitely extended, and then one of them cannot be shorter than the other, but that which had a part of it cut off will be as long as that which had not, which is absurd: Or else the line which was cut will not go on for ever like that other, but will stop and consequently be finite. Therefore if you add that part to it which was cut off from it at first, which was finite, the whole will be finite; and it will be no longer or shorter than that line which had nothing cut off from it, but equal to it. But this is finite, therefore the other is finite. And the body in which such lines are drawn is finite. But such lines may be drawn in all bodies. Therefore if we suppose an infinite body, we suppose an absurdity and impossibility.

§ 53 When by the singular strength of his genius (which he exerted in the finding out such a demonstration) he had satisfied himself that the body of Heaven was finite, he desired, in the next place, to know what figure it was of, and how it was limited by the circumambient superficies. And first he observed the Sun, Moon and stars, and saw that they all rose in the East, and set in the West; and those which went right over his head described a great circle, but those at a greater distance from the vertical point, either northward or southward, described a lesser circle. So that the least circles which were described by any of the stars, were those two which went round the two poles, the one North, the other South; the last of which is the Circle of Sohail or Canopus; the first, the Circle of those two Stars which are called Alpherkadâni. Now because he lived under the equinoctial line (as we showed

before) all those circles did cut the horizon at right angles, and both North and South were alike to him, and he could see both the pole-stars. He observed that if a star arose at any time in a great circle, and another star at the same in a lesser circle, yet nevertheless, as they rose together, so they set together: and he observed it of all the stars, and at all times. From whence he concluded that the Heaven was of a spherical figure; in which opinion he was confirmed, by observing the return of the Sun, Moon and stars to the East, after their setting; and also, because they always appeared to him of the same bigness, both when they rose, and when they were in the midst of Heaven, and at the time of their setting; whereas, if their motions had not been circular, they must have been nearer to sight at some times than others, and consequently their dimensions would have appeared proportionally greater or lesser; but since there was no such appearance, he concluded that the Heaven was spherical. Then he considered the motion of the Moon and the planets from West to East, till at last he understood a great part of astronomy. Besides, he apprehended that their motions must be in different spheres, all which were comprehended in another which was above them all, and which turned about all the rest from East to West in the space of a day and a night. But it were too tedious to explain particularly how he advanced in this science; besides, it is taught in other books; and what we have already said is as much as is requisite for our present purpose.

§ 54 When he had attained to this degree of knowledge, he found that the whole orb of the heavens and whatsoever was contained in it was as one thing compacted and joined together; and that all those bodies which he used to consider before, as earth, water, air, plants, animals and the like, were all of them so contained in it, as never to go out of its bounds: and that the whole was like one animal, in which the luminaries represented the senses; the spheres so joined and compacted together, answered to the limbs; and in the midst, the world of generation and corruption, to the belly, in which the excrements and humours are contained, and which oftentimes breeds animals, as the greater world.

§ 55 Now when it appeared to him that the whole World was as one individual, and he had united all the parts of it by the same way of thinking which he had before made use of in considering the world of generation and corruption; he proposed to his consideration the world in general, and debated with himself whether it did exist in time, after it had not been; and came to be out of nothing; or whether it had been from eternity, without any privation preceding it. Concerning this matter he had very many and great doubts, so that neither of these two opinions did prevail over the other. For when he proposed to himself the belief of its eternity, there arose a great many objections in his mind; because he thought that the notion of infinite existence was pressed with no less difficulties than that of infinite extension: And that such a being as was not free from accidents produced a-new, must also itself be produced a-new, because it cannot be said to be more ancient than those accidents: And that which cannot exist before accidents produced in time, must needs itself be produced in time. Then on the other hand, when he proposed to himself the belief of its being produced a-new, other objections occurred to him; for he perceived that it was impossible to conceive any notion of its being produced a-new, unless it was supposed that

there was time before it; whereas time was one of those things which belonged to the world, and was, inseparable from it; and therefore the world could not be supposed to be later than time. Then he considered, that a thing produced must needs have a producer: And if so, Why did this producer make the world now, and not as well before? Was it because of any new chance which happened to him? That could not be, for there was nothing existent besides himself. Was it then upon the account of any change in his own nature? But what should produce that change? Thus he continued for several Years, arguing pro and con about this matter; and a great many arguments offered themselves on both sides, so that neither of these two Opinions in his judgment over-balanced the other.

§ 56 This put him to a great deal of trouble, which made him begin to consider with himself what were the consequences which did follow from each of these Opinions, and that perhaps they might be both alike. And he perceived that if he held that the World was created in time, and had come into existence after a total privation, it would necessarily follow from thence that it could not have come into existence of itself, without the help of some agent to produce it. And that this agent must needs be such an one as cannot be apprehended by our senses; for if he should be the Object of sense, he must be body, and if body, then a part of the world, and consequently a created being; such an one as would have stood in need of some other cause to create him; and if that second creator was body, he would depend upon a third, and that third upon a fourth, and so ad infinitum, which is absurd. Therefore the world stands in need of an incorporeal creator: And if the creator thereof is incorporeal, it is impossible for us to apprehend him by any of our senses; for we perceive nothing by the help of them but body, or such accidents as adhere to bodies: And if he cannot be perceived by the senses, it is impossible he should be apprehended by the imagination; for the imagination does only represent to us the forms of things in their absence, which we have before learned by our senses. And if he is not body, we must not attribute to him any of the properties of body; the first of which is extension, from which he is free, as also from all those properties of bodies which flow from it. And if he is the maker of the world, doubtless he has the sovereign command and knowledge of it. Shall not he know it, that created it? He is wise, omniscient!(4)

§ 57 Furthermore, he saw that if he held the eternity of the world, and that it always was as it now is, without any privation before it; then it would follow that its motion must be eternal too; because there could be no rest before it, from whence it might commence its motion. Now all motion necessarily requires a mover; and this mover must be either a power diffused through some body, that is through the body of a being which moves itself, or through some other body without it, or else a certain power not diffused or dispersed through any body at all. Now every power which passes, or is diffused, through any body, is divided or doubled according as the body is divided or doubled. For instance; the gravity in a stone, by which it tends downwards, if you divide the stone into two parts, is divided into two parts also; and if you add to it another like it, the gravity is doubled. And if it were possible to add stones in infinitum, the gravity would increase in infinitum too. And if a stone should grow to a certain size and stop there, the gravity would also increase to such a

pitch, and no farther. Now it is demonstrated that all body must necessarily be finite; and consequently, that power which is in body is finite too. If therefore we can find any power which produces an infinite effect, it is plain that it is not in body. Now we find that the Heaven is moved about with a perpetual motion, without any cessation, since we admit the Heaven to be eternal. Whence it necessarily follows that the power which moves it is not in its own body, nor in any other exterior body; but proceeds from something altogether abstracted from body, and which cannot be described by corporeal adjuncts or properties. Now he had learned from his first contemplation of the world of generation and corruption, that the true reality of body consisted in its form, which is its disposition to several sorts of motion; but that the reality which consisted in its matter was very mean, and scarce possible to be conceived. Therefore the reality of the whole world consists in its disposition to be moved by this mover, who is free from matter and the properties of body, abstracted from every thing which. we can either perceive by our senses or reach by our imagination. And if he is the efficient cause of the divers motions of the heavens, which he produces by an action in which there is no irregularity, no abatement, no cessation; without doubt he has power over them, and a knowledge of them.

§ 58 Thus his contemplation this way brought him to the same conclusion it did the other Way. So that doubting concerning the eternity of the world, and its existence de novo, did him no harm at all. For it was plain to him both ways, that there was an agent, which was not body, nor joined to body, nor separated from it, nor within it, nor without it, because conjunction and separation, and being within any thing, or without it, are all properties of body, from which that agent is altogether abstracted. And because the matter in all bodies stands in need of a form, as not being able to subsist without it, nor exist really, and the form itself cannot exist but by this agent; it appeared to him that all things owed their existence to this agent, and that none of them could subsist but through him: and consequently, that he was the cause, and they the effects, (whether they were newly created after a privation, or whether they had no beginning in time ‘twas all one) and creatures whose existence depended upon that agent; and that without his continuance they could not continue, nor exist without his existing, nor have been eternal without his being eternal, but that he was essentially independent of them, and free from them. And how should it be otherwise, when it is demonstrated that his power and might are infinite, and that all bodies and whatsoever belongs to them are finite? Consequently, that the whole world and whatsoever was in it, the heavens, the Earth, the stars, and whatsoever was between them, above them, or beneath them, was all his Work and creation, and posterior to him in Nature, if not in time. As, if you take anybody whatsoever in your hand, and then move your hand, the body will without doubt follow the motion of your hand, with such a motion as shall be posterior to it in nature, though not in time, because they both began together. So all this World is caused and created by this agent, out of time, whose command is, when he would have anything done, be, and it is. (5)

§ 59 And when he perceived that all things which did exist were his workmanship, he looked them over again, considering in them attentively the power of their author, and

admiring the Wonderfulness of the Workmanship, and such accurate Wisdom and subtle knowledge. And there appeared to him in the most minute creatures (much more in the greater) such footsteps of wisdom, and wonders of the work of creation, that he was swallowed up with admiration, and fully assured that these things could not proceed from any other than an agent of infinite perfection, nay, that was above all perfection; such an one " to whom the Weight of the least atom was not unknown, whether in Heaven or Earth; no, nor any other thing, whether lesser or greater than it." (6)

§ 60 Then he considered all the kinds of animals, and how this agent had given such a fabric of body to every one of them, and then taught them how to use it. For if he had not directed them to apply those members which he had given them, to those respective uses for which they were designed, they would have been so far from being of any service that they would rather have been a burden. From whence he knew that the creator of the world was supereminently bountiful and exceedingly gracious. And then when he perceived among the creatures, any that had beauty, elegance, perfection, strength, or excellence of any kind whatever, he considered with himself, and knew that it all emanated from that agent, and from his existence and operation. And he knew that what the agent had in his own nature, was greater than that which he saw in the creatures, more perfect and complete, more beautiful and glorious, and more lasting; and that there was no proportion between the one and the other. Neither did he cease to prosecute this search, till he had run through all the attributes of perfection, and found that they were all in this agent, and all flowed from him; and that he was most worthy to have them all ascribed to him, above all the creatures which were described by them.

§ 61 In like manner he enquired into all the attributes of imperfection, and perceived that the maker of the world was free from them all. And how was it possible for him to be otherwise, since the notion of imperfection is nothing but mere non-existence, or what depends upon it? And how can he any way partake of non-existence, who is the pure existence, necessarily by his essence; who gives being to every thing that exists, and besides whom there is no existence; but He is the being, He the perfection, He the plenitude, He the beauty, He the glory, He the power, He the knowledge? He is He, and besides Him all things are subject to perishing. (7)

§ 62 Thus far his Knowledge had brought him towards the end of the fifth septenary from his birth, viz. when he was 35 years old. And the consideration of this supreme agent was then so rooted in his heart, that it diverted him from thinking upon any thing else: and he so far forgot the consideration of the creatures, and the enquiring into their natures, that as soon as ever he cast his eyes upon anything of what kind soever, he immediately perceived in it the work of this agent; and in an instant his thoughts were taken off from the work, and transferred to the worker. So that he was inflamed with the desire of him, and his heart was altogether withdrawn from thinking upon this inferior world, which contains the objects of sense, and wholly taken up with the contemplation of the upper, intellectual world.

Endnotes:

(1) Koran lxxvi, 1.
(2) cf. Koran xviii, 16.
(3) Koran viii, 17.
(4) Koran lxvii, 14.
(5) Koran xxxvii, 82.
(6) Koran xxxiv, 3.
(7) Koran xxviii, 88.