PROOFS

OF THE

THEORY OF THE EARTH.

ARTICLE V.

Examination of ſome other Syſtems.

THE three hypotheſes formerly animadverted upon have many things in common: They all agree in this, that, at the time of the deluge, both the external and internal form of the earth was changed. But none of theſe theoriſts conſidered, that the earth, before the deluge, was inhabited by the ſame ſpecies of men and animals; and, conſequently, that it muſt have been nearly the ſame, both in figure and ſtructure, as it is at preſent. We are informed by the ſacred writings, that, before the deluge, there were rivers, ſeas, mountains, and foreſts; that moſt of theſe mountains and rivers remained nearly in their former ſituation; the Tigris and Euphrates, for

for example, ran through Paradiſe; that the Armenian mountain on which the ark reſted, was, at the deluge, one of the higheſt mountains of the earth, as it is at this day; and that the ſame plants and the ſame animals, which inhabited the earth before the deluge, continue ſtill to exiſt; for we are told of the ſerpent, of the crow, and of the pigeon that carried the olive-branch into the ark. Tournefort indeed alleges, that there are no olives within 400 leagues of Mount Ararat, and affects to be witty on this head. It is, however, indiſputable, that there were olives in the neighbourhood of this mountain at the time of the deluge; for Moſes aſſures us of the fact in the moſt expreſs manner. Beſides, it is not ſurpriſing, that, in the courſe of 4000 years, the olives ſhould be extirpated in theſe provinces, and multiplied in others. It is, therefore, contrary both to ſcripture and reaſon, that theſe authors have ſuppoſed the earth, before the deluge, to have been totally different from what it is now; and this oppoſition between their hypotheſes and the ſacred writings, as well as ſound philoſophy, is ſufficient to diſcredit their ſyſtems, although they ſhould correſpond with ſome phænomena *. Burnet, who wrote firſt, gives neither facts nor obſervations in ſupport of his ſyſtem. Woodward's book is only a ſhort eſſay, in which he promiſes much more than he was able to perform; it is only a project, with-

* See Voyage du Levant, vol. ii. p. 336.

out any degree of execution. He makes uſe of two general remarks, 1. That the earth is every where compoſed of materials which had formerly been in a ſtate of fluidity, and which had been depoſited by the waters in horizontal beds. 2. That, in the bowels of many parts of the earth, there are an infinite number of ſea-bodies. To account for theſe facts, he has recourſe to the univerſal deluge; or rather, he appears to employ theſe as proofs of the deluge. But, like Burnet, he falls into evident contradictions; for it is abſurd to ſuppoſe, with theſe authors, that, before the deluge, there were no mountains, ſince we are expreſsly told, that the waters roſe 15 cubits above the tops of the higheſt mountains. On the other hand, it is not ſaid that the waters deſtroyed or diſſolved the mountains. In place of this extraordinary diſſolution, the mountains remained firm in their original ſituations, and the ark reſted upon the one which was firſt deſerted by the waters. Beſides, it is impoſſible to imagine, that, during the ſhort time the deluge continued, the waters could diſſolve the mountains, and the whole fabric of the earth. Is it not abſurd to ſuppoſe, that, in the ſpace of forty days, the hardeſt rocks and minerals were diſſolved by ſimple water? Is it not a manifeſt contradiction to admit this total diſſolution, and yet to maintain that ſhells, bones, and other productions of the ſea, were able to reſiſt a menſtruum to which the moſt ſolid materials

terials had yielded? Upon the whole, I cannot heſitate in pronouncing, that Woodward, though furniſhed with excellent facts and obſervations, has produced but a weak and inconſiſtent theory.

Whiſton, who wrote laſt, has greatly improved upon the other two; and, though he has given looſe reins to his imagination, it cannot be ſaid that he falls into contradiction. He advances many things which are incredible; but they are neither abſolutely nor apparently impoſſible. As we are ignorant of what materials the centre of the earth is compoſed, he thinks himſelf intitled to ſuppoſe it a ſolid nucleus, ſurrounded with a ring of heavy fluid matter, and then follows a ring of water, upon which the external cruſt is ſupported. In this ring of water, the different parts of the cruſt ſunk more or leſs in proportion to their gravities, and gave riſe to mountains and inequalities on the ſurface of the earth. But our aſtronomer here commits a blunder in mechanics. He conſidered not, that the earth, on this ſuppoſition, muſt have formed one uniform arch; and, conſequently, that it could not be ſupported by the water, and far leſs could any part of this arch ſink deeper than another. If this be excepted, I doubt whether he has fallen into any other phyſical blunder: He has, however, committed many errors both in metaphyſics and theology. In fine, it cannot be denied abſolutely, that the earth, in meeting with the tail of a comet, would be deluged,

luged, eſpecially if it be allowed to the author, that the tails of comets contain watery vapours. Neither is it abſolutely impoſſible, that the tail of a comet, in returning from its perihelion, ſhould burn the earth, if we ſuppoſe, with Mr. Whiſton, that the comet paſſed very near the ſun's body. The ſame obſervations may be made upon the reſt of his ſyſtem. But, though his notions be not abſolutely impoſſible, when taken ſeparately, they are ſo exceedingly improbable, that the whole aſſemblage may be regarded as exceeding the bounds of human credulity.

Theſe three are not the only books which have been written upon the theory of the earth. In 1729, M. Bourguet publiſhed, along with his *Philoſophical Letters on the formation of Salts, &c.* a memoir, in which he gives a ſpecimen of a ſyſtem which he had projected; but the execution of it was prevented by the death of the author. It muſt be acknowledged, that no man was more induſtrious and acute in making obſervations, and in collecting facts. To him we are indebted for remarking the correſpondence between the angles of mountains, which is the chief key to the theory of the earth. He arranges the materials he had collected in the beſt order. But, with all theſe advantages, it is probable, that he would not have ſucceeded in giving a phyſical hiſtory of the changes which have happened in the earth; and he appears not to have diſcovered the cauſes of thoſe effects which he

he relates. To be convinced of this remark, we have only to take a view of the propoſitions he deduces from thoſe phænomena which muſt have been the foundation of his theory. He ſays, that the earth was formed at once, and not ſucceſſively; that its figure and diſpoſition demonſtrate that it was formerly in a fluid ſtate; that the preſent condition of the earth is very different from what it was ſome ages after its firſt formation; that the matter of the globe was originally more ſoft than after its ſurface was changed; that the condenſation of its ſolid parts diminiſhed gradually with its velocity; ſo that, after a certain number of revolutions round its own axis, and round the ſun, its original ſtructure was ſuddenly diſſolved; that this happened at the vernal equinox; that the ſea-ſhells inſinuated themſelves into the diſſolved matters; that the earth, after this diſſolution, aſſumed its preſent form; and that, as ſoon as the fire or heat operated upon it, its conſumption gradually began, and, at ſome future period, it will be blown up with a dreadful exploſion, accompanied with a general conflagration, which will augment the atmoſphere, and diminiſh the diameter of the globe; and then the earth, in place of ſtrata of ſand or clay, will conſiſt only of beds of calcined materials, and mountains compoſed of amalgams of different metals.

This is a ſufficient view of the ſyſtem which M. Bourguet deſigned to compoſe. To gueſs at the

the paſt, and to predict the future, nearly in the ſame manner as others have gueſſed and predicted, requires but a ſmall effort of genius. This author had more erudition than ſound and general ideas. He appears not to have had the capacity of forming enlarged views, or of comprehending the chain of cauſes and effects.

In the Leipſic Tranſactions, the celebrated Leibnitz publiſhed a ſketch of an oppoſite ſyſtem, under the title of Protogæa. The earth, according to Bourguet and others, was to be conſumed by fire. But Leibnitz maintains, that it originated from fire, and that it has undergone innumerable changes and revolutions. At the time that Moſes tells us the light was divided from the darkneſs, the greateſt part of the earth was in flames. The planets, as well as the earth, were originally fixed and luminous ſtars. After burning for many ages, he alleges, that they were extinguiſhed from a deficiency of combuſtible matter, and that they became opaque bodies. The fire, by melting the matter, produced a vitrified cruſt; and the baſis of all terreſtrial bodies is glaſs, of which ſand and gravel are only the fragments. The other ſpecies of earth reſulted from a mixture of ſand with water and fixed ſalts; and, when the cruſt had cooled, the moiſt particles, which had been elevated in the form of vapour, fell down, and formed the ocean. Theſe waters at firſt covered the whole ſurface, and even overtopped the higheſt

higheſt mountains. In the eſtimation of this author, the ſhells, and other ſpoils of the ocean, which every where abound, are indelible proofs that the earth was formerly covered with the ſea; and the great quantity of fixed ſalts, of ſand, and of other melted and calcined matters ſhut up in the bowels of the earth, demonſtrate, that the conflagration had been general, and that it had preceded the exiſtence of the ocean. Theſe ideas, though deſtitute of evidence, are elevated, and bear conſpicuous marks of ingenuity. The thoughts have a connection, the hypotheſes are not impoſſible, and the conſequences which might be drawn from them are not contradictory. But the great defect of this theory is, that it applies not to the preſent ſtate of the earth. It only explains what paſſed in ages ſo remote, that few veſtiges remain; a man may, therefore, affirm what he pleaſes, and what he ſays will be accompanied with more or leſs probability, in proportion to the extent of his talents. To maintain, with Whiſton, that the earth was originally a comet, or with Leibnitz, that it was a ſun, is to aſſert what is equally poſſible or impoſſible; it would, therefore, be ridiculous to inveſtigate either by the laws of probability. The inſtantaneous creation of the world deſtroys the notion of the globe's being covered with the ocean, and of that being the reaſon why ſea-ſhells are ſo much diffuſed through different parts of the earth; for, if that had

had been the caſe, it muſt of neceſſity be allowed, that ſhells, and other productions of the ocean, which are ſtill found in the bowels of the earth, were created long prior to man, and other land-animals. Now, independent of ſcripture-authority, is it not reaſonable to think that the origin of all kinds of animals and vegetables is equally ancient?

M. Scheutzer, in a diſſertation addreſſed to the Academy of Sciences in 1708, attributes, like Woodward, the change, or rather new creation of the globe, to the deluge. To account for the formation of mountains, he tells us, that God, when he ordered the waters to return to their ſubterraneous abodes, broke, with his Almighty hand, many of the horizontal ſtrata, and elevated them above the ſurface of the earth, which was originally level. The whole diſſertation was compoſed with a view to ſupport this ridiculous notion. As it was neceſſary that theſe eminences ſhould be of a ſolid conſiſtence, M. Scheutzer remarks, that God only raiſed them from places which abounded in ſtones. Hence, ſays he, thoſe countries, like Switzerland, which are very ſtony, are likewiſe mountainous; and thoſe, like Flanders, Holland, Hungary, and Poland, which are moſtly compoſed of ſand and clay to great depths, have few or no mountains *.

* Vid. Hiſt. de l'Acad. 1708. p. 32.

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This author, like Woodward, blends phyſics and theology; and, though he has made ſome good obſervations, the ſyſtematic part of his work is weaker and more puerile than that of any of his predeceſſors. He has even deſcended to declamation, and abſurd pleaſantries. The reader, if he deſires to ſee them, may conſult his *Piſcium Querelæ*, &c. not to mention his *Phyſica Sacra*, conſiſting of ſeveral volumes in folio, a weak performance, fitter for the amuſement of children than the inſtruction of men.

Steno, and ſome others, have attributed the origin of mountains, and other inequalities upon the ſurface of the earth, to particular inundations, earthquakes, &c. But the effects of theſe ſecondary cauſes could produce nothing but ſlight changes. Theſe cauſes may co-operate with the firſt cauſe, namely, the tides, and the motion of the ſea from eaſt to weſt. Beſides, Steno has given no theory, nor even any general facts, upon this ſubject *.

Ray alleges, that all mountains have been produced by earthquakes, and has written a treatiſe to prove the point. When we come to the article of volcano's, we ſhall examine the foundation of this opinion.

We cannot omit obſerving here, that Burnet, Whiſton, Woodward, and moſt other authors, have fallen into an error which deſerves to be rectified. They uniformly regard the deluge as

* Vide Differt. de Solido intra Solidum nato, &c.

an effect within the compass of natural causes, although the scripture represents it as an immediate operation of the Deity. It is beyond the power of any natural cause to produce on the surface of the earth a quantity of water sufficient to cover the highest mountains: And, although a cause could be imagined adequate to this effect, it would still be impossible to find another cause capable of making the waters disappear. Granting that Whiston's water proceeded from the tail of a comet, we deny that any of them could issue from the abyss, or that the whole could return into it; for the abyss, according to him, was so environed and pressed on all sides by the terrestrial crust, that it was impossible the comet's attraction could produce the least motion in the fluid it contained, far less any motion resembling the tides: Hence, not a single drop could either proceed from, or enter into, the great abyss. Unless, therefore, it is supposed, that the waters which fell from the comet were annihilated by a miracle, they would for ever have remained on the surface, and covered the tops of the highest mountains. The impossibility of explaining any effect by natural causes, is the most essential character of a miracle. Our authors have made several vain efforts to account for the deluge. Their errors in physics, and in the secondary causes they employ, prove the truth of the fact, as related in scripture, and demonstrate, that the universal deluge could not be accom-

accomplished by any other cause than the will of the Deity.

Besides, it is apparent, that it was not at one time, nor by the sudden effect of a deluge, that the sea left uncovered those continents which we inhabit: it is certain, from the authority of scripture, that the terrestrial Paradise was in Asia, and that Asia was inhabited before the deluge; consequently, the waters, at that period, covered not this large portion of the globe. The earth, before the deluge, was nearly the same as now. This enormous quantity of water, poured out by Divine justice upon guilty men, destroyed every living creature; but it produced no change on the surface of the earth; it destroyed not even the plants; for the pigeon returned to the ark with an *olive branch* in her bill.

Why then should we suppose, with many naturalists, that the waters of the deluge totally changed the surface of the globe, even to the depth of two thousand feet? Why imagine that the deluge transported those shells, which are found at the depth of seven or eight hundred feet, immersed in rocks and in marble? Why refer to this event the formation of hills and mountains? And how is it possible to imagine, that the waters of the deluge transported banks of shells of 100 leagues in length? I perceive not how they can persist in this opinion, unless they admit a double miracle, one to create water, and

another to tranſport ſhells. But as the firſt only is ſupported by holy writ, I ſee no reaſon for making the ſecond an article of faith.

On the other hand, if the waters of the deluge had retired ſuddenly, they would have carried off ſuch immenſe quantities of mud and ſoil, as would have rendered the land unfit for culture till many ages after this inundation. In the inundation which happened in Greece, the country that was covered remained barren for three centuries*. Thus the deluge ought to be regarded as a ſupernatural mode of chaſtiſing the wickedneſs of men, not as an effect proceeding from any natural cauſe. The univerſal deluge was a miracle, both in its cauſe and in its effects. It appears from the ſacred text, that the ſole deſign of the deluge was the deſtruction of men and other animals, and that it changed not in any manner the ſurface of the earth; for, after the retreat of the waters, the mountains, and even the trees, kept their former ſtations, and the land was ſuited for the culture of vines and other fruits of the earth. It might be aſked, if the earth was diſſolved in the waters, or, if the waters were ſo much agitated as to tranſport the ſhells of India into Europe, how the fiſhes, which entered not into the ark, were preſerved?

The notion, that the ſhells were tranſported and left upon the land by the deluge, is the general

* Vide acta erudit. Lipſ. 1691, p. 100.

neral opinion, or rather ſuperſtition, of naturaliſts. Woodward, Scheutzer, and others, call petrified ſhells the remains of the deluge; they regard them as medals or monuments left us by God of this dreadful cataſtrophe, that the memorial of it might never be effaced among men. Laſtly, they have embraced this hypotheſis with ſo blind a veneration, that their only anxiety is to reconcile it with holy writ; and, in place of deriving any light from obſervation and experience, they wrap themſelves up in the dark clouds of phyſical theology, the obſcurity and littleneſs of which derogate from the ſimplicity and dignity of religion, and preſent to the ſceptic nothing but a ridiculous medley of human conceits and divine truths. To attempt an explanation of the univerſal deluge and of its phyſical cauſes; to pretend to give a detail of what paſſed during this great revolution; to conjecture what effects have reſulted from it; to add facts to the ſacred writings, and to draw conſequences from theſe interpolations; is not this a preſumptuous deſire of ſcanning the power of the Almighty? The natural wonders wrought by his beneficent hand, in a uniform and regular manner, are altogether incomprehenſible; his extraordinary operations, or his miracles, ought, therefore, to impreſs us with an awful aſtoniſhment, and a ſilent reſpect.

It may ſtill be urged, that, as the univerſal deluge is an eſtabliſhed fact, is it not lawful to reaſon

ſon upon its conſequences? True. But you muſt commence with acknowledging, that the deluge could not poſſibly be the effect of any phyſical cauſe; you muſt regard it as an immediate operation of the Deity; you muſt content yourſelf with what is recorded in ſcripture; and you muſt, above all, avoid blending bad philoſophy with the purity of divine truth. After taking theſe precautions, which a reſpect for the counſels of the Almighty requires, what remains for examination upon the ſubject of the deluge? Do the ſacred writings tell us that the mountains were formed by the deluge? They tell us the reverſe. Do they inform us that the agitation of the waters was ſo great, as to raiſe the ſhells from the bottom of the ocean, and to diſperſe them over the face of the earth? No: The ark moved gently on the ſurface of the waters. Do they tell us, that the earth ſuffered a total diſſolution? By no means. The narration of the ſacred hiſtorian is ſimple and true; that of naturaliſts is complicated and fabulous.

PROOFS

OF THE

THEORY OF THE EARTH.

ARTICLE VI.

Geography.

THE ſurface of the earth is not, like that of Jupiter, divided into alternate bands or belts, parallel to the equator. On the contrary, it is divided, from one pole to the other, into two belts of earth, and two of ſea. The firſt and principal belt is the ancient Continent, the greateſt length of which is a line commencing at the moſt eaſtern point of the north of Tartary, and extending from thence to the neighbourhood of the gulf of Linchidolin, where the Ruſſians fiſh whales; from thence to Tobolſki; from Tobolſki to the Caſpian ſea; from the Caſpian ſea to Mecca; from Mecca to the weſtern part of the country inhabited by the Galli in