

# I. *An Account of the Giants Causeway in the North of Ireland: By the Reverend Dr. Sam. Foley.*

**T**H E *Giants Causeway* is placed by Mr. *Cole* in the annexed Map of the Sea-Coast of the District of *Colerain*, somewhat more than Eight English Miles North-East from the Town of *Colerain*, in the County of *Antrim*, about Three English Miles from the *Bush-Mills*, almost directly North. It runs from the bottom of an high Hill into the Sea, no Man can tell how far, but at low-water the *length* of it is about 600 Foot, and the *breadth* of it in the broadest place 240 Foot, in the narrowest 120 Foot: It is very unequal likewise in the height, in some places it is about 36 Foot high from the level of the Strand, and in other places about 15 Foot.

It consists of many Thousands of Pillars, which stand most of them Perpendicular to the Plain of the Horizon close to one another, but we could not discern whether they do run down under Ground like a Quarry or no. As to the Number of the Pillars, we could not guess that they are fewer than One Hundred Thousand; but the shape of the Causeway is so irregular, that we could not number the Columns of one side or end, in order to make a probable Computation of them all; some are very long, and higher than the rest, others short and broke; some for a pretty large space of an equal height, so that their tops make an even plain Surface, many of them imperfect, crack'd, and irregular; others entire, uniform, and handsome, and these of different shapes and sizes: We found none at all Square, but

but almost all Pentagonal, or Hexagonal; only we observed that a few had seven sides; and many more Pentagons than Hexagons; but they were all irregular, for none that we could observe had their sides of equal breadth; the Pillars are some of them 15, some 18 Inches, some two Foot in Diameter, none of them are one entire Stone, but every Pillar consists of several Joynts or Pieces, as we may call them, of which some are six, some twelve, some eighteen Inches, some two Foot deep.

These Pieces stand close one upon the other, not joyning with flat surfaces; for when you force one off the other, one of them is always Concave in the middle, the other Convex. There are many of this kind of Joynts, which lye loose upon some part of the Causeway, and on the Strand, which were blown or wash'd off the Pillars: These Joynts are not always placed alike, for in some Pillars the Convexity is always upwards, and in others it stands always downwards. They always lye as close as 'tis possible for one Stone to lye upon another, so that on the out-side of the Pillars you can but discern the crack that joyns the two Stones: When you force them asunder, both the Concave and Convex Superficies are very smooth, as are also the sides of the Pillars which touch one another: For when we pulled away some of the Pillars which stood outwards to the Weather, the sides of the Pillars which stood next behind them looked as fresh as Stones newly hewn, being of a whitish Free-stone colour, but a finer closer gret; whereas when we broke some pieces off them, the inside appeared like dark Marble.

The Pillars that are made up of these Joynts stand so close one to another, that a Knife can hardly be thrust in between the sides of them; and though some have five sides, and others of them six, yet the Contextures of them are so adapted, that there is no vacuity between

tween them; the inequality of the Numbers of the sides of the Pillars being often in a very surprising and wonderful manner throughout the whole Causeway compensated by the inequality of the Breadths and Angles of those sides: So that the whole at a little distance looks very Regular; and where in many places a good number of the Pillars are exactly of the same height, the Superficies of the tops of them looks very like the Pavements that are in some Gentlemens Halls, abating the irregularity of the sides, but these lye as close.

The Pillars, as I said before, are some of them thicker than others, according as 'tis necessary to make them lye close in those various Figures, but every single Pillar does retain its own Thickness, and Angles, and Sides from top to bottom; so that if one of them were cut Horizontally into never so many Segments, they would all have Sides and Angles exactly equal and parallel.

Those Pillars which seem to be entire as they were Originally, are at the top flat and rough; those which lye low to the Sea are wash'd smooth; and others that seem to have their Natural tops blown or wash'd off, are some Concave, and others Convex.

The Looms or Organs, as the Country People call them, mentioned in the Draught, are a parcel of such Pillars as those in the Causeway, which stand in the side of a Hill at some distance from the Causeway; the Pillars in the middle are longest, and those of each side of them are still shorter and shorter.

*Answers*

*Answers to Sir Richard Bulkeley's Queries relating to the Giants Causeway, wrote down when we were upon the Causeway.*

Quer. 1. **W**Hether any of the Pillars are Hexagons, or whether there be any Squares, or whether they be all Pentagons only?

Ans. The Pillars are composed of Stones which stand one upon another, some half a Foot, others a Foot, others a Foot and half, and two Foot thick; which are most either Pentagons or Hexagons all of them irregular, we saw no Squares, and but a few Heptagons.

Q. 2. *Whether any of those Pillars have Joynts, and which have not?*

Ans. All the Pillars are composed of distinct pieces, which we may call Joynts, that lye upon one another as close as 'tis possible for Stones to lye.

Q. 3. *Whether the Natural tops of these Pillars have any gravings upon them, or striate lines, or are naturally smooth?*

Ans. The tops of the Pillars have no gravings or striate lines; those which are often covered with the Sea, are made smooth by the washing of it; but those nearer the Land are flat and rough: Some of the tops are now Concave, and some Convex; but we suppose their Natural tops, which were rough and flat, are washed or blown off.

Q. 4. *Whether there be any Regularity in the sides of the Cylinders of the several sorts of Cylinders, and whether the sides be not very unequal, some very broad, and some very narrow, as in the Planes of Crystals?*

Ans. The sides of the Pillars are from top to bottom very smooth, but those sides are of unequal lengths, however they answer the sides of the Pillars that

stand next about them, so that they lye close, and without any Interstices. *Note, as a more full and further Answer to this Query, I find by the two Joynts of this Stone sent hither to Dublin, that the several sides of one and the same Pillar are as in the Planes of Crystals, of very unequal breadths or lengths, call it either, when you measure them Horizontally; and that in such as are Hexagonal a broader side always subtends, or is opposite to a narrower, which sort of Geometry Nature likewise observes in the formation of Crystals.*

*Q. 5. Whether the Mountain, or broken Cliff it self shews any Beds of these Pillars in several Classes, or stratum super stratum, the lowest to the Sea being all Perpendicular; and how many Beds or Orders there are to make up to the top of the Mountain; or else whether they lye confusedly, and on heaps, or obliquely?*

*Ans.* The high Bank hanging over the Causeway on that side which lyes next it, and towards the Sea, seems to be for the most part composed of the common sort of Craggy-Rock; only we saw a few irregular Pillars on the East side, and some farther on the North, which they call the Looms or Organs; but just over the Causeway we saw as it were the tops of some Pillars appearing out of the sides of the Hill, not standing, nor lying flat, but sloping.

*Q. 6. What Beds of Earth are near them, or what other sort of Stones above them?*

*Ans.* No Beds of Earth, but all common Rock.

*Q. 7. What may be supposed to be the number of those Pillars?*

*Ans.* We guess they cannot be so few as One Hundred Thousand; but the shape of the Causeway is so irregular, that it is scarce possible to reckon them.

*Q. 8. Whether the Superficies of the sides of the Pillars be Caniculate, or any other ways hollow'd?*

*Ans.* Not at all, but smooth Planes.

*Q. 9.*

Q. 9. *Whether the Causway consists of only one Stratum, or Class of Pillars ?*

Ans. The Causway is very unequal both in height and breadth : The highest Pillars we saw we computed to be about 36 Foot high from the place where we stood on the Strand beside the Causway ; others not above 20, some 10 Foot, and some still shorter, *though these do not stand according to Regular Orders, or different Classes :* We suppose each Pillar throughout the Causway to continue the same to the very bottom, for all that we saw on the sides were so.

I have annexed two Figures, drawn by Mr. Cole, Collector in those Parts ; one of the Causway, the other of the adjoining Sea-Coast ; which will make the whole much more Intelligible, and to these I refer you. He tells me, he has not drawn the Causway as a Prospect, nor as a Survey or Platform, which he thought would not answer his Design, and that he has no other name for it but a Draught, which he took after this sort : He supposed the Hills and Causway, &c. Epitomized to the same height and bigness the Draught shews them, and this he fancied the most Intelligible way to express it. Thus far Dr. Foley.

*Some Notes upon the foregoing Account of the Giants Causway, serving to further Illustrate the same. By T. Molyneux, M. D. S. R. S.*

**T**His mighty large Pile of Stony Columns, that goes under the Name of the *Giants Causway*, I take not only to be as Remarkable a Natural Curiosity of its sort as this *Country* affords, but perhaps as may be met with in *Europe* : For I cannot well imagine, that if a Fossil so extraordinary in its kind

in any of these more civilized Parts of the World, that it could hitherto escape the many *Inquisitive Naturalists*, that of late by their Industrious Researches and Writings have so plentifully embellish'd, and so far advanced the *History of Nature* in all its parts.

But we must confess that this sort of Learning has hitherto been much more diligently cultivated, as to the *Vegetable* and *Animal Kingdoms*, whilst the *Fossil* or *Mineral*, though scarce affording less Variety, has not been so carefully examined, but rather neglected. However so very notable a Production in Nature, as the Stones of this Causeway, were it to be found at least in any of our Neighbouring Kingdoms, I am confident could not have passed so long undescribed: And since 'tis a *Fossil*, we must reckon it among the *Non-descripts*; I would not omit any thing that lay in my Power, which might the least contribute to further Illustrate so very *Observable* a *Curiosity*, though I have never as yet been upon the place myself.

But here it may not be amiss at first, to obviate a gross mistake, I find not a few, though I confess such only that are perfect strangers to Natural History, have been apt to run into, by thinking this great Pile of Stones so compactly put together, is rather the Workmanship of Art and Mens Hands, than an Original Production of Nature; misguided, I suppose, chiefly by the *Barbarous Name* the Superstitious People of the Country have given it; who through Ignorance, do usually ascribe whatever is strange and extraordinary, though Natural, to the working of *Giants*, *Fairies*, *Dæmons*, and such like Imaginary Causes.

But if any one will in the least consider its Situation, adjoyning close to precipitious Hills, not Accessible by Man without great difficulty; the way of its Course running strait forward into the very Sea, and losing it self under Water; that there is not the least sign of Morter,

Morter, or any equivalent Cement, to joyn the Commissures or Sides of the Columns together; that there are no foot-steps of the strokes of Tools or Chissels, in the Surface of any part of the Stone; that there are other parcels of the like Stone, which lye still in their Native Beds, as they were first produced in the adjoining Mountain. If, I say, one will but a little consider these Circumstances, I am sure he can't imagine that *Men* could have the least Design in putting all this useless Lumber in this most wonderful manner together in so Remote and Desolate a place. And for such, that will ascribe it to *Giants*, or *Dæmons*, I think do not deserve any Answer.

But nothing puts this point more out of Dispute, than to make a little Enquiry into other Works of Nature of the like kind; where though perhaps we may find nothing altogether the same, yet we may observe some of her Productions, that at least bear such an *Analogy*, or Resemblance to the Composition and Figure Remarkable in these Stones, that we shall easily conclude These as well as They must certainly be the Architecture of the Regular Hand of Nature.

Among the several *figured Stones* already described by Authors, I find none that has more agreement with those that compose our *Giants Causeway*, than the *Entrochos*, the *Astroites*, or *Lapis Stellaris*, and the *Lapis Basanus*, or *Basaltes*: And yet for all the great Resemblance they have in some particulars, they differ very much in others: I shall here therefore set down, for the more clearly understanding the above Description of the Causeway, wherein consists the agreement and disagreement between those three sorts of Stones, and this we are now more particularly treating of.

The *Entrochos* agrees with the Pillars of our Causeway in that it's a Stony Substance, formed by Nature Column-wise, and consisting sometimes of 20 or 30 several  
*Internodia,*

*Internodia*, or Joynts set one a top of another; but then it differs in that its outward shape is round and Cylindrical, in its having a hole or Pith run from top to bottom through all the Joynts, in the setting on, or way of fitting one Joynt to another, and in its size and magnitude.

But the make of the *Astroites*, or *Lapis Stellaris*, seems to have still a greater affinity in its Formation with our *Irish* Stones; for 'tis not only shaped Column-wise, as the *Entrochos*, and joynted with several *Internodia* closely adjusted to one another, but its sides are *Angular*, and the manner of the Commissures of one Joynt to another in some particulars more resembles the way Nature observes in the Joynting of this Stone. *Boetius* in his *Gemmarum & Lapidum Historiâ*, speaking of the *Asteria vera*, or *Astroites*, has these words: *Plures simul cohererent articuli, ita concinnè, juncti & aptati, ut nullus Artifex melius jungere potuisset, separari tamen facile à se invicem possunt.* Which is exactly agreeable to the joyntings of our Stone; but then it must be observed, that the sides of the *Astroites* are always sulcated, or a little furrow'd, and are constantly *Pentagons*; whereas the *Irish* Stone has its sides perfectly smooth, and plane, and sometimes in *Hexagons* and *Heptagons*, as well as *Pentagons*.

Moreover if we Minutely compare the inward contrivance of two Joynts of the *Astroites* closing with one another, and two Joynts of this *Irish* Stone, we shall find a more considerable difference in the Commissure, than the external Superficies of both Stones at first sight would seem to intimate. For the *Astroites* has furrow'd and protuberant Rays striking from its centre, somewhat as they draw a Star, whence it has its Name, that adapting their Concavities and Convexities together, cause the cohesion of the Joynts to one another; whereas the internal Superficies of the *Internodia* in our *Irish* Stone

Stone sends forth no sort of Rays from its Centre, and unite to one another by a quite different Articulation, as may be gathered from the Description: But here Dr. *Foley* has omitted one Remarkable Particular, that I must needs take notice of; for besides what the Doctor Remarks of the bottom or top of each Joynt having a large round Concavity or Convexity, that extends it self from the Centre of the Stone within an Inch or two of the Angular Circumference; examining two Joynts that were sent up from the place hither to Town, I observed likewise, that the bottom or top of each Joynt round this Concavity or Convexity either rises with an eminent Verge or Ridge, if it be Concave in the middle; or if it be Convex, is hollow'd with such a sort of Groove, as to receive closely into it all the eminent Ridge of the next Joynt either above or below it; so that each Superficies in the Articulations adapt themselves on all sides so exactly one to t'other, as 'tis possible for two Bodies, that are only contiguous, and not cohering, but moveable from one to another with little more force than is requisite to stir a Body of that Gravity: But this peculiar moulding in the Joynts would be far better exprest by a Scetch that should exactly represent the bottom and top of two of them separate from each other, than by any Description consisting of never so many words.

Some of the Figures of the Plate-stones Dr. *Lister* gives us in the *Philos. Transact.* N<sup>o</sup>. 100. seems to have some agreement to the Joynts of these Pillars, in being Hexagonal, and having in the middle, at top, or bottom, a round Concave or Convex Superficies, especially that mark'd *Fig. 32.* but then 'tis much smaller, and he speaks of it as a single Plate, without any more Joynts found with it.

But the *Astroites* also as well as the *Entrochos*, differs extreamly from our Stone in its size, or magnitude;  
for

for the largest that is found of either of those kinds, do not much exceed the thickness of a Man's Thumb, whereas our Columns are some of them two Foot in Diameter.

Yet this disproportion of bulk is not so considerable a difference, since we observe that Nature affects the like disparity in other of her Works, and those too nearly allied, and evidently of the same Tribe or Family. For Example, to instance a Comparison taken from Vegetables, let us consider the vast disproportion between one of our small joynted *Rushes* or *Reeds*, and the largest *East-Indian Bambon*, one of which I remember to have seen in *Holland* above 26 Foot high, and as thick as a Man's middle, and yet these are Plants all of the same Species and Class.

I chose the rather to instance these kind of Vegetables that have joynted stems, on the account they seem to bear somewhat of Analogy or Resemblance to the *Geniculated Mineral*, or *Rock-Plants* we are speaking of, as I may call them with that accurate and experienced Enquirer into Natural History, Dr. *Lister*.

This affinity between Plants and Fossils, will not seem altogether imaginary to any one that Judiciously considers, how the various Classes of Beings in the Creation, even from the perfectest to the most imperfect are link'd together, and as it were related by slow descents and Gradations from one to t'other; so that some of every Rank still partake of certain immediate Properties, common to the Tribe above them, and below them, as well as their own: Thus, the *Monky* has something of the *Man*, and *Quadrupede*; the *Batt*, of the *Bird* and *Beast*; the *Amphibious*, of the *Beast* and *Fish*; the *Hirundo Marina*, or *Flying Fish*, of the *Bird* and *Fish*; the *Mollusci*, and *Zoophyta*, of the *Fish* and *Plant*; and so of the rest.

But

But to return to our *Giants Causway*; nothing among all the Fossil Tribe that I have seen or read of, comes so nigh in all respects, in its Formation, Substance, Size, way of Growth, or manner of Standing, &c. to the Columns whereof 'tis composed, as the *Lapis Basaltes Misenus*, described by *Kentmannus* in *Gesner de Figuris Lapidum*, from whence *Boetius* takes both his Figure and Description, whereof he says there is a great large Bed within three Miles of *Dresden* in *Saxony*: He gives the following Account of it thus in his own words. —

*Lapides angulosi plures coagmentati Basalten repræsentant, qui crescit formâ & crassitudine tigni mediocris, singularis quidem sed copiosus, atque ita junctus coaptatusque, veluti ab Arculario arte commissus esset; septem, sex, quinque, nonnunquam sed rarius quatuor Angulorum: Omnino figurâ trabis erectæ, foris lævis, & tactu minime asper, ferrugineus, ponderosus, duritie velut adamantis; Hi Lapides sic coagmentati è terrâ ulnas decem & septem exstant; quanto spatio intra terram condantur, nemini adhuc exploratum est.* Thus far *Kentmannus*; who could scarce in so many words have better described the Collection of Pillars, that make the *Giants Causway*, as if he had seen them on the place; Only I find this difference between them and the *Misnean Basaltes*, that its Columns were one entire Piece from top to bottom, and some of them four-squared; whereas our *Irish Basaltes* is composed of Columns, whereof none are four-squared, and all of them divided into many Joynts. So that I think it may not improperly be called, to distinguish it from this and all other Fossils,

*Lapis Basaltes vel Basanos maximus Hibernicus, angulis minimum quinque plurimum septem constans; crebris articulis sibi invicem affabrè conjunctis, sed faciliè separabilibus, geniculatus.*

Whether our *Irish Basaltes* can pretend to the Name *Basanos* on the same account the *Misnean* does, from the

Greek word *Βρανίζω*, *exploro*, because it has the Property of the *Touch-stone*, that shews by lines drawn with Metals on its smooth Surface, which are Genuine, and which Adulterate, I cannot positively say; because those Pieces I have are so rough, that unless some part of the Superficies were Artificially polish'd, the Experiment cannot be made: Yet I have reason to believe it would succeed, were the Stone polish'd; because I find *black Marble* in general, so it be of a close Texture and hard, as this is, always partakes of that Property.

May the 19th. 1694.

## P O S T - S C R I P T.

SINCE my Writing of this, I find inserted in one of the late *Philos. Transact.* N<sup>o</sup>. 199. that is but just come to my hands, a sort of an Account of the *Giants Causeway*, that is so full of Errors, and gross Mistakes, that nothing in it can be relied on; as where it says, *The Pillars do not consist of Joyns, but are of one entire Piece*, where he calls them *Cylinders*, and a little after, *Cylinders with Angles*, and says, *some of them are four-squared*; of which sort of Figures there is not one to be met with in the whole Number. But of this enough, which I have added only for Truth's sake, that no one may be misguided in this Piece of Natural History by Mistakes, or false Reports.

II. An

