

terrestrium densitatis partem adæquaret, nec sibi ipsi diversis temporibus similis observaretur, vaporibus istis omni alio adminiculo destitutis.

Multa sunt & alia ratiocinia physica, quibus nostra de atmosphæra lunari opinio fulciri posset: sed astronomice tantum, non physice, rem discutiendam suscepimus. Lectorem satis in hujus operis decursu distinuisse mihi visus sum: huic itaque finem impono, illustrissimæ SOCIETATIS in re tam ancipiti judicium pro ipsissima rei veritate libentissime amplexurus.

IV. *A Narrative of an extraordinary Sinking down and Sliding away of some Ground at Pardines near Auvergne, sent from M. T— to a Relation in England, translated from the French, and communicated to the ROYAL SOCIETY by Phil. Henry Zollman, Esq; F. R. S.*

THE Parish of *Pardines*, in the District of *Issoire* (in *Auvergne*) is situate about a League from the Town of *Issoire* on the Road to *Clermont*, almost on the Top of a pretty steep Hill.

This Parish consists of two Villages or Hamlets distant from each other about 200 Paces; the one, which is called *Le Fort*, in which is the Parish Church, and Part of the Houses of the Inhabitants, stands upon a Rock; there appear the Remains of an antient Fortification, with which some Houses were surrounded in the time of the Wars.

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The other Village, which is properly called *Pardines*, was composed of the greater Part of the Houses of the Inhabitants to the Number of 46 Buildings ; the Ground whereon this Village was built, as well as that of the whole Hill, is a good and light Earth, mixed with a little white Clay : There are also found in it some Stones and Rocks of a middling Size. This Land was very well cultivated, and very fruitful, consisting of Fields sowed with Corn, of Orchards, and for the greater Part of Vineyards ; the whole Ground was overspread with Fruit-trees, particularly Walnut-trees.

This Earth used to dry soon and chap from the Heat ; they even observed in it long since Clefs of a considerable Depth, which sometimes growing wider and wider, formed several Gullies.

On the 23d of *June* 1733. about Nine in the Evening, the Inhabitants of the Village of *Pardines* saw the Walls of their Houses shake sensibly ; whereupon they all retired out of them, and saw that the Hill visibly melted away, as it were, the greater Part of the Land sliding along towards the Vale ; others subsided sensibly ; in some Places the Earth, opening itself, formed new Gulls, and those that were observed there before, grew much wider ; sometimes the Ground which slid along in great Pieces, stopt and tumbled one Piece over the other ; and the Rocks, which broke loose from that rolling Earth, precipitated themselves into the Valley, which at present is quite filled up with them, as well as with the Earth which rolled down, whereby the Road from *Issoire* to *Clermont* is become impassable.

All this was done, not with any impetuous Motion, but very gently, and even sometimes almost imperceptibly; a sensible Motion was observed during the Space of three or four Days at different times; there was even a House which did not fall till the 10th of the present Month of *July*. During all that Time no Noise was heard, any otherwise than what proceeded from the Rocks falling into the Valley, and from some large Clods of Earth, which loosening themselves from the steeper Parts, fell down with Precipitation.

By this Rolling were carried away 26 Buildings, large or small, some of which subsided with the Ground, and, being shaken at their Foundations, tumbled on a Heap; the Remains of some others appear, as yet, on those Pieces of Ground that rolled down into the Valley.

It is computed, that the Lands which slid away, or were lost by being buried under the Rubbish of the others, amount to the Number of 466 *Oeuvres* of Vineyards, 40 *Septerées* of arable Land, and 56 *Oeuvres* of Grass-fields, which all together may make up 150 Acres of *Paris* Measure. It is observable, that in this Number were comprised several Orchards, besides that the whole Ground was covered with Trees, either Walnut-trees on the Hill, or Willows and Poplars in the Valley, of which they reckon 4000 in all.

If one may conjecture what was the Cause of so dismal an Accident, it seems it proceeded from the Situation of the Ground, and the Nature of the Soil. The first Surface of the Hill about four or five Foot deep, was a pretty light Earth, easily dried by the
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the Heat of the Sun; under this first Layer there was a *Stratum* of fat Clay, which at present lies open in several Places, and which is very moist, so that one even sees the Water bubbling out of it in some Places.

The great Rains that fell in the Beginning of the Spring, soaked through and diluted this *Stratum* of Clay, which retained and gathered all the Waters of the Hill running between the two Layers; the Heat of the Summer ensued, which dried up the upper Surface, and formed it into a sort of solid Crust, which Crust resting itself upon a fat and moist Clay, and by its steep Situation being inclined to slide towards the Valley, the whole Surface of it loosened itself by great Pieces, and breaking in several Places, slid along towards the Place whither its Declivity would naturally carry it. There are some Parts which moved almost insensibly, and only sunk or subsided, either because the Rolling of the neighbouring Soils made room, that what was under this Surface might slide off, or perhaps because the Parts under this Surface had been hollowed a long while since, by the Waters which passed between this Surface and the *Stratum* of fat Clay. Other Parts, which were much more in Number, rolled all together towards the Valley, and one sees yet whole Pieces of Vineyards, with the Props remaining upright; which may easily be conceived: There are again other Parts, which in tumbling were overturned in different manners.

I am to add here, that this Accident is not without Example in the Province of *Auvergne*; we have not indeed seen so considerable a one till now, yet
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it has often happened, that Pieces of Earth of a Quarter or Half an Acre, have separated themselves all in one Piece, from the Top of a Hill, and slid down visibly on the Lands lying below.

How considerable soever this Accident may be in regard to the poor People who suffered by it, yet it was to be wished it was the only one that has befallen this Province. The Overflowings of the River *Allier*, and of the Rivers and Brooks that run into it, and the Hail that fell almost continually since, have intirely ruined above One hundred Parishes, in which they will have no Harvest this Year as for Corn and Hemp, nor any Vintage at all.

V. *A Dissertation on the Worms which destroy the Piles on the Coasts of Holland and Zealand, by Job Baſter, M. D. F. R. S. communicated by the President of the ROYAL SOCIETY. Translated * from the Latin by T. S. M. D. F. R. S.*

SECTION I.

IN the Year 1730. the Persons appointed to take care of the Dikes on our Coasts, observed that the Piles made of the hardest Oak, defending the

* This is here inserted in *English*, because a very ample Treatise hath been published in *Latin* on the same Subject, intituled, *Godofredi Sellii, J. U. D. R. S. Lond. S. Hist. Nat. Terebinis seu Xylophagi marini. Tubulo-conchoidis*, Traj. ad Rhen. 1733. 4to.