flector on the 17th of March; and on the 3d of April, the ſame year, when the planet appeared totally deprived of this noble appendage, by reaſon of the edge of the ring being then turned directly towards the earth, and inviſible on account of its thinneſs or incapacity to reflect the light to ſuch a diſtance. During the ſuccecding year, the ring appeared gradually open­ed, and at laſt aſſumed the ſhape of an ellipſe. “It ſhould be noticed (ſays he), that the black diſk or belt upon the ring of Saturn is not in the middle of its breadth. Nor is the ring ſubdivided by many ſuch lines, as has been repreſented in ſeveral treatiſes of aſtronomy; but that there is one Angle, dark, conſiderably broad line, belt, or zone, upon the ring, which I have al­ways permanently found in the place where my figure repreſents it. ”

This zone, which is on the northern part of the ring, does not change its ſhape or colour like the belts of Ju­piter, ſo that it is probably owing to ſome permanent projection. It cannot, however, be the ſhadow of a chain of mountains, as it is viſible all round the ring; and there could be no ſhades viſible at the ends of the anſae, on account **of** the direction of the ſun’s illumination, which would be in the line of the chain; and the ſuppoſed ar­gument will hold good againſt the ſuppoſition of caverns or concavities. It is likewiſe evident, that this dark zone is contained between two concentric circles, as all the phenomena anſwer to the projection of ſuch a zone. The Doctor gives a figure, repreſenting the planetas it appeared to him on the 10th of May 1780; whence we ſee that the zone is continued all the way round, with a gradual decreaſe towards the middle, anſwering to the appearance of a narrow circular plane projected into an ellipſis. See Philoſoph. Tranf. for 1790, p. 3, &c.

It hath been conjectured, that this appearance is owing to a diviſion of the ring, or rather that there are two rings about the planet; “but (lays Dr Herſchel) if one ring, of a breadth ſo conſiderable as that of Sa­turn, is juſtlv to be eſteemed the moſt wonderful arch that by the laws of gravity can be held together, how improbable muſt it appear to ſuppoſe it ſubdivided into narrow flips of rings, which by this ſeparation will be deprived of a ſufficient depth, and thus loſe the only dimenſion which can keep them from falling upon the planet? It is true, indeed, that it may revolve with ſuch velocity as greatly to aſſiſt its ſtrength, and that in the ſubdiviſions, of courſe, the different velocities for each diviſion may be equally ſuppoſed to keep them up. ”

As to the ſubſtance of the ting, the Doctor ſuppoſes it to be no leſs ſolid than that of Saturn himſelf. Thus in the two figures given with the Doctor’s Diſſertation in the Philoſophical Tranſactions above referred to, the ſhadow of the planet is delineated upon the ring as it actually appeared, according to the ſituation of the ſun; and in like manner we will ſee the ſhadow of the ring upon the planet: and if we deduce the quantity of mat­ter contained in the planet from the power by which the ſatellites are preſerved in their orbits, the ring muſt alſo be taken into account. It is indeed evident that the ring exerts a very conſiderable force upon theſe bodies, ſince we find them affected with many irregularities in their motions, which we cannot properly aſcribe to any other cauſe than the quantity of matter contained in the ring; or, at leaſt, it ought to be allowed to have a proper ſhare in producing them.

The ring ſeems to be endowed with a greater reflec­tive power than the body of the planet; and the Doc­tor gives inſtances of his feeing part of the ring brighter than Saturn himſelf, as well as of his feeing it plainly through a teleſcope which could ſcarcely afford light enough for the planet. The moſt remarkable proper­ty of this wonderful ring, however, is its extreme thinneſs. “When we were nearly in the plane of the ring (ſays our author), I have repeatedly ſeen the ſirſt, ſecond, and third ſatellites, nay even the ſixth and ſeventh. paſs before and behind the ring in ſuch a manner that they ſerved as excellent micrometers to eſtimate its thickneſs. It may be proper to mention a few inſtances, eſpecially as they will ſerve to ſolve ſome phenomena that have been remarked by other aſtronomers, though they have not been accounted for in a manner conſiſtently with other known facts. July 18th 1789, at 19h 41' 9*",* ſidereal time, the firſt ſatellite ſeemed to hang upon the following arm, declining à little towards the north, and I ſaw it gradually advance upon it to­wards the body of Saturn; but the ring was not ſo thick as the lucid point. July 23d, at 19h 41' 8''; the ſecond ſatellite was a very little preceding the ring; but the ring appeared to be leſs than half the thickneſs of the ſatellite. July 27th, at 20h 15' 12", the ſecond ſatellite was about the middle, upon the following arm of the ring, and towards the ſouth; and the ſixth ſa­tellite on the farther end towards the north; but the arm was thinner than either of them, Aug. 29th, at 22h 12' 55", the third ſatellite was upon the ring, near the end of the preceding arm, when the latter ſeemed not to be the fourth, or at moſt the third part of the diameter of the ſatellite; which, in the ſituation it was, I took to be leſs than one ſingle ſecond in dia­meter. At the ſame time, I alſo ſaw the ſeventh ſatellite following the third, at a little diſtance, in the ſhape of a bead upon a thread, projecting on both ſides of the ſame arm. Hence alſo we are ſure that the arm appeared thinner than the ſeventh ſatellite, which is conſiderably ſmaller than the ſixth, which again is leſs than the ſirſt Auguſt 31 ft, at 20h 48' 26", the pre­ceding arm was loaded about the middle with the third ſatellite. October 15th, at 0h 43' 44", I ſaw the ſixth ſatellite, without obſtruction, about the middle of the preceding arm, though the ring was but barely viſible with my 40 feet reflector, even while the planet was in the meridian. However, we were then a little inclined to the plane of the ring, and the third ſatellite, when it came near its conjunction with the ſirſt, was ſo ſituated, that it muſt have partly covered it a few minutesafter I loſt it behind my houſe. In all theſe obſervatiυns, the ring did not in the leaſt interfere with my view of the ſatellites. October 16th, I followed the ſixth and ſeventh ſatellites up to the very diſk of the planet; and the ring, which was extremely faint, did

not in the leaſt obſtruct my ſeeing them gradually ap­proach the diſk, wſhere the ſeventh vaniſhed at 21h 46⁰ 44", and the ſixth at 22h 36' 44". There is, however, ſome ſuſpicion, that by a refraction through ſome very rare atmoſphere on the two planes of the ring, the ſa­tellites might be lifted up and depreſſed ſo as to become viſible on both ſides of the ring, even though the latter ſhould be equal in thickneſs to the diameter of the ſmalleſt ſatellite, which may amount to 1000 miles. — As for the arguments of its incredible thinneſs. which