Foot and an half long, and perpendicular to the plain of the Rule **AB**. This flem is fitted with two pieces for eigewife parallel to each other, and which being covered with a very thin Plate, make a fquare Tube, within which the plumb line or perpendicular G H is inclosed, which is feen through two Glaffes which answer to the two extremities thereof. It has also a third opening at the bottom of the Tube, through which, with ones Finger, the motion of the plumb may be flayed.

Article 5.

Upon the plain of the Rule A B is failed the Telefcope EF, which is of the fame make with that which we have deferibed for the Quadrant, and tho all the pieces have been already reprefented in the first Plate, yet we judged it not impertinent to reprefent it once more in another order, and a bigger fize : But that we might not be obliged to repeat the Difcourfe, we have put to it the fame Letters.

A Painters Æfell ferves for a fupport to this Inftrument, and for accommodating it to the inequality of the ground, the Rule A B is arched underneath with two bows which bear upon the two pins of the Æfell; that it may be easile to raife or fink the direction of the Telescope as there shall be need, without altering the Æfell; and when the ground happens to be unequal, one may lengthen this or that Foot of it by the means of a rod of Iron which is joyned to it.

With this Inftrument the level may he determined at one glance to a very great diffance, even much more than is fet down in the precedent Table. But there is generally one great obstacle upon the account of refractions, which makes the Objects appear above the line, they ought to be feen in. For example, in the fecond Figure let A be the center of the Earth, BC its ordinary furface, and DI the tops of the Mountains, we are to confider that the Earth is inveloped with an Atmosphere or vaporous Air composed of different Regions, which are more fubtil the further they are removed from the Earth, but in fuch fort that the change is not made all at once, but by Degrees, the vifual Ray which comes from a higher place to a lower, as from D to I, which paffes obliquely from a more fubtil to a more grofs Air, is continually bent in its way in proportion as it changes the medium, which gives it the pofition of a curve line, much like that of DFI, but the Eye that is in I, receives the curve Ray as if it were the Tangent IE, in which it fees the Object D. For the fame reason if we suppose another eye in D, it fees the Object I in the ftrait line D G. tangent to the fame bended Ray DFB: And supposing that the two tangents IE and D.G which are in place of the vifual rays cut each other in H. one may imagine that there happens the lame thing, as if the two Objects D and I were respectively seen with one only refraction which thould be made in H. and which thould be equivalent to all those of the true Ray DFL r 201 - 1-

For discovering of these refractions, and also for knowing the total value of them which we suppose reduced to the Angle DHE or IHG. the two Angles AIE and ADG ought to have been observed.

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