Fig. 17. The ſame thing I try'd alſo by letting the Sun's Light into a dark Room through two little round holes F and φ made in the Window, and with two Parallel Priſms ABC and αβγ placed at thoſe holes (one at each) refracting thoſe two beams of Light to the oppoſite Wall of the Chamber, in ſuch manner that the two colour'd Images P T and M N which they there painted were joyned end to end and lay in one ſtraight Line, the red end T of the one touching the blew end M of the other. For if theſe two refracted beams were again by a third Priſm D H placed croſt to the two firſt, refracted Sideways, and the Spectrums thereby tranſlated to ſome other part of the Wall of the Chamber, ſuppoſe the Spectrum P T to *p t* and the Spectrum M N to *m n*, theſe tranſlated Spectrums *p t* and *m n* would not lie in one ſtraight Line with their ends contiguous as before, but be broken off from one another and become Parallel, the blew end of the Image *m n* being by a greater Refraction tranſlated farther from its former place M T, than the red end *t* of the other Image *p t* from the ſame place M T which puts the Propoſition paſt diſpute. And this happens whether the third Priſm D H be placed immediately after the two firſt or at a great diſtance from them, ſo that the Light refracted in the two firſt Priſms be either white and circular, or coloured and oblong when it falls on the third.

Exper. 6. In the middle of two thin Boards I made round holes a third part of an Inch in Diameter, and in the Window-ſhut a much broader hole, being made to let into my darkned Chamber a large beam of the Sun's Light; I placed a Priſm behind the Shut in that beam to refract it towards the oppoſite Wall, and cloſe behind the Priſm I fixed one of the Boards, in ſuch manner that the middle of the refracted Light might paſs through the hole made

made in it, and the reſt be intercepted by the Board. Then at the diſtance of about twelve Feet from the firſt Board I fixed the other Board, in ſuch manner that the middle of the refracted Light which came through the hole in the firſt Board and fell upon the oppoſite Wall might paſs through the hole in this other Board, and the reſt being intercepted by the Board might paint upon it the coloured Spectrum of the Sun. And cloſe behind this Board I fixed another Priſm to refract the Light which came through the hole. Then I returned ſpeedily to the firſt Priſm, and by turning it ſlowly to and fro about its Axis, I cauſed the Image which fell upon the ſecond Board to move up and down upon that Board, that all its parts might ſucceſſively paſs through the hole in that Board and fall upon the Priſm behind it. And in the mean time, I noted the places on the oppoſite Wall to which that Light after its Refraction in the ſecond Priſm did paſs; and by the difference of the places I found that the Light which being moſt refracted in the firſt Priſm did go to the blew end of the Image, was again more refracted in the ſecond Priſm than the Light which went to the red end of that Image, which proves as well the firſt Propoſition as the ſecond. And this happened whether the Axis of the two Priſms were parallel, or inclined to one another and to the Horizon in any given Angles.

Illuſtration. Let F be the wide hole in the Window-ſhut, *Fig.* 18. through which the Sun ſhines upon the firſt Priſm A B C, and let the refracted Light fall upon the middle of the Board D E, and the middle part of that Light upon the hole G made in the middle of that Board. Let this trajected part of the Light fall again upon the middle of the ſecond Board *d e* and there paint ſuch an oblong coloured Image of the Sun as was deſcribed in the third Experiment.

By

By turning the Priſm A B C ſlowly to and fro about its Axis this Image will be made to move up and down the Board *d e*, and by this means all its parts from one end to the other may be made to paſs ſucceſſively through the hole *g* which is made in the middle of that Board. In the mean while another Priſm *a b c* is to be fixed next after that hole *g* to refract the trajected Light a ſecond time. And theſe things being thus ordered, I marked the places M and N of the oppoſite Wall upon which the refracted Light fell, and found that whilſt the two Boards and ſecond Priſm remained unmoved, thoſe places by turning the firſt Priſm about its Axis were changed perpetually. For when the lower part of the Light which fell upon the ſecond Board *d e* was caſt through the hole *g* it went to a lower place M on the Wall, and when the higher part of that Light was caſt through the ſame hole *g*, it went to a higher place N on the Wall, and when any intermediate part of the Light was caſt through that hole it went to ſome place on the Wall between M and N. The unchanged Poſition of the holes in the Boards, made the Incidence of the Rays upon the ſecond Priſm to be the ſame in all caſes. And yet in that common Incidence ſome of the Rays were more refracted and others leſs. And thoſe were more refracted in this Priſm which by a greater Refraction in the firſt Priſm were more turned out of the way, and therefore for their conſtancy of being more refracted are deſervedly called more Refrangible.

Exper. 7. At two holes made near one another in my Window-ſhut I placed two Priſms, one at each, which might caſt upon the oppoſite Wall (after the manner of the third Experiment) two oblong coloured Images of the Sun. And at a little diſtance from the Wall I placed a long ſlender Paper with ſtraight and parallel edges, and ordered

Fig. 17.

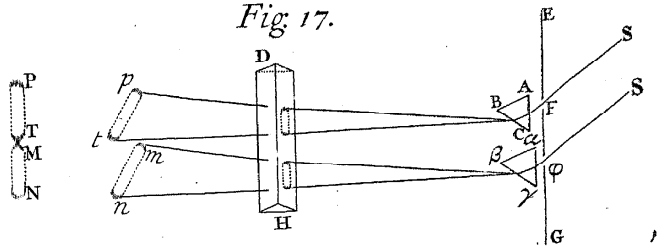


Fig. 18.

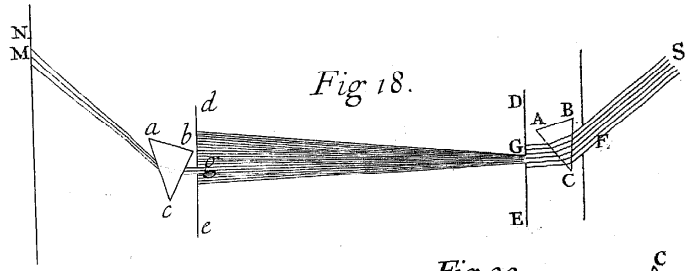


Fig. 19.

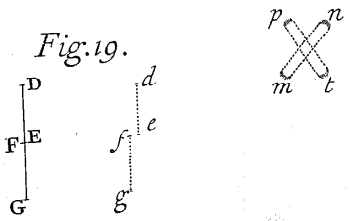


Fig. 20.

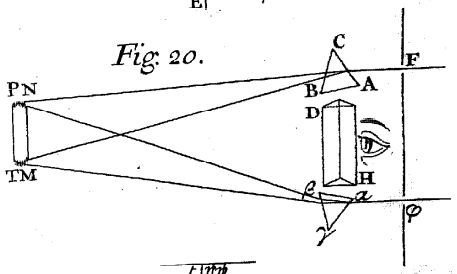


Fig. 21.

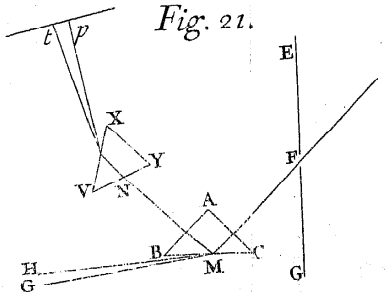
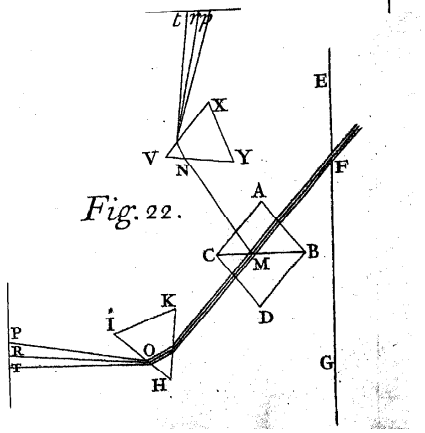


Fig. 22.



OPTICKS:

Stamford 1719

OR, A

TREATISE

OF THE

REFLEXIONS, REFRACTIONS,
INFLEXIONS and COLOURS

OF

LIGHT.

ALSO

Two TREATISES

OF THE

SPECIES and MAGNITUDE

OF

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