why does refracting prism separate colors and not water, is it because of the material, or because rays enter but also exit? find out.
it seems to me that hook simply did not take the color matter seriously, maybe he was happy enouh about his refraction index / wave explanation.
newton tried to change the colors again, not, make them white again. my previous thought comes from the observation that hooke surely must have / could have tried this as well.

"he altogether renounced the attempt to construct the universe from its foundations after the fashion of Descartes, and aspired to nothing more than a formulation of the laws which directly govern the actual phenomena.His theory of gravitation, for example, is strictly an expression of the results of observation,and involves no hypothesis as to the cause of the attraction which subsists between ponderable bodies; and his own desire in regard to optics was to present a theory free from speculation as to the hidden mechanism of light. Accordingly, in reply to Hooke's criticism, he protested* that his views on colour were in no way bound up with any particular conception of the ultimate nature of optical processes. Xewton was, however, unable to carry out his plan of connecting together the phenomena of light into a coherent and reasoned whole without having recourse to hypotheses.The hypothesis of Hooke,that light consists in vibrations of an aether,he rejected for reasons which at that time were perfectly cogent, and which indeed were not successfully refuted for over a century.One of these was the incompetence of the wave theory to account for the rectilinear propagation of light, and another was its inability to embrace the facts discovered,as we shall presently see,by Huygens,and first interpreted correctly by Newton himself of polarization. On the whole, he seems to have favoured a scheme of which the following may be taken as a summary:"

I should make a list of these aether 'theories' each summarized like the one above.

"The truth of Hooke's hypothesis, that light is essentially a form of motion, seemed to Huygens to be proved by the effects observed with burning-glasses;fo r in the combustion induced at the focus of the glass, the molecules of bodies are dissociated; which,as he remarked, must be taken as a certain sign of motion, if,in conformity to the Cartesian philosophy, we seek the cause of all natural phenomena in purely mechanical actions."

" The question then arises as to whether the motion is that of a medium, as is supposed in Hooke's theory, or whether it may be compared rather to that of a flight of arrows, as in the corpuscular theory. Huygens decided that the former alternative is the only tenable one, since beams of light proceeding in directions inclined to each other do not interfere with each other in any way."

"Moreover,ithadpreviouslybeenshownbyTorricellithat
lightistransmittedasreadilythroughavacuumasthrough air;
andfromthisHuygensinferredthatthemediumoraether
inwhichthepropagationtakesplacemustpenetrateallmatter, andbepresenteveninallso-calledvacua"

"IItmayberemarkedthatHuygens'"waves"arereallywhatmodernwriters,
followingHooke,call"pulses";Huygensneverconsideredtruewave-trains
havingthepropertyofperiodicity"

if,inconformitytotheCartesianphilosophy,weseekthecause
ofallnaturalphenomenainpurelymechanicalactions
note. Understandable, as yet another ex. of experience extrapolation.

Theprocessofwave-propagationhediscussedbyaidofa
principlewhichwasnowfintroducedforthefirsttime,andhas
sincebeengenerallyknownbyhisname.Itmaybestated thus: Considerawave-
front,*orlocusofdisturbance,asit existsatadefiniteinstantt:theneachsurface-elementofthe wave-frontmayberegardedasthesourceofasecondarywave,
whichinahomogeneousisotropicmediumwillbepropagated outwardsfromthesurface-elementintheformofasphere whoseradiusatanysubsequentinstanttisproportionalto (t-t);andthewave-frontwhichrepresentsthewholedistur
banceattheinstanttissimplytheenvelopeofthesecondary
waveswhicharisefromthevarioussurfaceelementsofthe originalwave-front.*Theintroductionofthisprincipleenabled HuygenstosucceedwhereHookeandothercontemporary wave-theoristsfhadfailed,inachievingtheexplanationof refractionandreflexion

note. does this also help explain aberration instead of using a corpusc. theory? find out.

does not this make for a wavefrobt that travels 'forward' but also 'back' at all times? find out.
is it that the secondary spheres are only creared at 'disturbance' points? this would then cause both refl and refr simultaneously

a footnote says this was justified a lot later by fresnel in anales de chimie. Keep this in mind.

could heuygens' idea have originated from thinking of water? each particle gen'ing a secondary wave with 'Phases sync'd when there is no disturbance' ?
if not do not be bothered too much, remember model versus phys explanation. despite this, it would be nice to find who first thought abiut envelopes, does tge idea follow when ine thinks a bit about waves?

Theactualexplanationforthecaseofreflexionisasfollows:
LetABrepresenttheinterfaceatwhichreflexiontakes place, AHCtheincidentwave-frontataninstant,GMBthe positionwhichthewave-frontwouldoccupyatalaterinstantt ifthepropagationwerenotinterruptedbyreflexion.Thenby "G
Huygens'principlethesecondarywavefromAisattheinstant
tasphereENSofradiusequaltoAG:thedisturbancefromHt
aftermeetingtheinterfaceatK,willgenerateasecondary
waveTVoiradiusequaltoKM,andsimilarlythesecondary
wavecorrespondingtoanyotherelementoftheoriginal
frontcanbefound.Itisobviousthattheenvelopeofthese secondarywaves,whichconstitutesthefinalwave-front,willbe aplaneBN,whichwillbeinclinedtoABatthesameangleas AC.Thisgivesthelawofreflexion.
Thelawofrefractionisestablishedbysimilarreasoning,
onthesuppositionthatthevelocityoflightdependsonthe
mediuminwhichitispropagated.Sincearaywhichpasses
fromairtoglassisbentinwardstowardsthenormal,itmaybe
inferredthatlighttravelsmoreslowlyinglassthaninair

Huygensofferedaphysicalexplanationofthevariationin
velocityoflightfromonemediumtoanother,bysupposing
thattransparentbodiesconsistofhardparticleswhichinteract
withtheaetherealmatter,modifyingitselasticity.The
opacityofmetalsheexplainedbyanextensionofthesame
idea,supposingthatsomeoftheparticlesofmetalsarehard
(theseaccountforreflexion)andtherestsoft:thelatterdestroy theluminousmotionbydampingit

note. make precise wave of light and seeing 'only perp', eye device function.

note. i found a footnote related to the idea above, perp. in this case is not required
Thewordrayinthewave-theoryisalwaysappliedtothelinewhichgoes
fromthecentreofawave(i.e.theoriginofthedisturbnnce)toapointonits
surface,whatevermaybetheinclinationofthislinetothesurface-elementon
whichitabuts;forthislinehastheopticalpropertiesofthe"rays"ofthe emissiontheory

ThesecondhalfoftheTheoriedelalumiereisconcernedwith
aphenomenonwhichhadbeendiscoveredafewyearspreviouslybyaDanishphilosopher,ErasmusBartholin(b.1625, d.1698).AsailorhadbroughtfromIcelandtoCopenhagena
numberofbeautifulcrystalswhichhehadcollectedintheBay
ofEoerford.Bartholin,intowhosehandstheypassed,noticed*
thatanysmallobjectviewedthroughoneofthesecrystals
appeareddouble,andfoundtheimmediatecauseofthisinthe
factthatarayoflightenteringthecrystalgaveriseingeneral
totworefractedrays.Oneoftheserayswassubjecttothe
ordinarylawofrefraction,whiletheother,whichwascalled
theextraordinaryray,obeyedadifferentlaw,whichBartholin didnotsucceedindetermining.
Thematterhadarrivedatthis
/origins

note. similarly for heuygens' spheroid, we need schizopgrsnia here, the 'free' modeller, the explaining philosopher. keep them separated.

note. only later did huygens craft the following 'explanation'
Isupposeonecomposedofsmallspheroids,andanotherwhich

occupiestheinterspacesaroundthesespheroids,andwhichserves
tobindthemtogether.Besidesthese,thereisthematterof
aetherpermeatingallthecrystal,bothbetweenandwithinthe
parcelsofthetwokindsofmatterjustmentioned;forIsuppose
boththelittlespheroids,andthematterwhichoccupiesthe
intervalsaroundthem,tobecomposedofsmallfixedparticles,
amongstwhicharediffusedinperpetualmotionthestillfiner
particlesoftheaether.Thereisnownoreasonwhythe
ordinaryrayinthecrystalshouldnotbeduetowavespropagatedinthisaetherealmatter.Toaccountfortheext
raordinary refraction,Iconceiveanotherkindofwaves,whichhavefor
vehicleboththeaetherealmatterandthetwootherkindsof
matterconstitutingthecrystal.Oftheselatter,Isupposethat
thematterofthesmallspheroidstransmitsthewavesalittle
morequicklythantheaetherealmatter,whilethataroundthe
spheroidstransmitsthesewavesalittlemoreslowlythanthe
sameaetherealmatter....Thesesamewaves,whentheytravel
inthedirectionofthebreadthofthespheroids,meetwith
moreofthematterofthespheroids,oratleastpasswithless
obstruction,andsoarepropagatedalittlemorequicklyinthis sensethanintheother;thusthelight-
disturbanceispropagated asaspheroidalsheet

Thatarayoflightshouldpossesssuchpropertiesseemedto
Newtonfaninsuperableobjectiontothehypothesiswhich
regardedwavesoflightasanalogoustowavesofsound.On
thispointhewasintheright:hisobjectionsareperfectly validagainstthewave-
theoryasitwasunderstoodbyhis contemporariesJ,althoughnotagainstthetheorywhichwasput
forwardacenturylaterbyYoungandFresnel

note. is it maybe that a general vibration source in 3d can simul. vibrate along all 3 axes? in other words be composed of 3 'elementary' ones?
imagine a string, it vibrates in a plane, along on direction. imagine a string in the perp plane vibrating along, both not intersecting, now imagine a 3rd one, vibrating at tge remaining axis. is this what does not happen for sound waves, byt can happen in general? light? is this polarization? does this explain the double refraction? i have serious doubts, but it is an idea nevertheless. in general somd additional property has to be added to the model to fix it.
also, does not double refr. exclude the corpusc. theory? what would be needed to fix it? some material dynamics? a wild fix would be imagining the corpuscules hitting the biundary and switchung it between a state and anothrr at every hit, just like a rotating mirror with two possible angles.

BetweenthemagneticandelectricforcesGilbertremarked
manydistinctions.Thelodestonerequiresnostimulusoffriction
suchasisneededtostirglassandsulphurintoactivity.
Thelodestoneattractsonlymagnetizablesubstances,whereas
electrifiedbodiesattracteverything.Themagneticattraction
betweentwobodiesisnotaffectedbyinterposingasheetof
paper,oralinencloth,orbyimmersingthebodiesinwaterj
whereastheelectricattractionisreadilydestroyedbyscreens.
Lastly,themagneticforcetendstoarrangebodiesindefinite

a graphical 'infographic' of yhe tgeiries of aether, light, and heat would not beva bad idea. together with vlad?

pg 54, attribution in footnote

pg 55, vocab. promulgation

this is trye for many theories of the past and to come
Thetrue hypothesis,afterhavingmetwithgeneralacceptancethroughout
acentury,andhavingbeenapprovedbyasuccessionofillustriousmen,wasdeliberatelyabandonedbytheirsuc
cessors infavourofaconceptionutterlyfalse,and,insomeofits developments,grotesqueandabsurd

vocab. he propounded the theory ...