preciſely with the theory, perfectly achromatic, and the aberration of figure as much corrected as is poſſible.

Dr Blair examined the refractive and diſpersive powers of a great variety of ſubſtances, and found great varieties in their actions on the different colours. This is indeed what every well informed naturaliſt would expect. There is no doubt now among naturalists about the mechanical connec­tion of the phenomena of nature ; and all are agreed that the chemical actions of the particles of matter are perfectly like in kind to the action of gravitating bodies ; that all theſe phenomena are the effects of forces like thoſe which we call attractions and repulſions, and which we obſerve in magnets and electrified bodies ; that light is retracted by forces of the ſame kind, but differing chiefly in the small ex­tent of their ſphere of activity. One who views things in this way will expect, that as the actions of the ſame acid for the different alkalis are different in degree, and as the different acids have alſo different actions on the ſame alkali, in like manner different ſubſtances differ in their general re­tractive powers, and alſo in the proportion of their action on the different colours. Nothing is more unlikely there­fore than the proportional diſperſion of the different co­lours by different ſubſtances ; and it is ſurpriſing that this inquiry has been ſo long delayed. It is hoped that Dr Blair will oblige the public with au account of the experi­ments which he has made. This will enable others to co­operate in the improvement of achromatic glaſſes. We can­not derive much knowledge from what he has already publiſhed, becauſe it was chiefly with the intention of giving a popular, though not an accurate, view of the ſubject. The conſtructions which are there mentioned are not thoie which he found moſt effectual, but thoſe which would be moſt eaſily underſtood, or demonſtrated by the flight theory which is contained in the diſſertation ; beſides, the manner of expreſſing the difference of refrangibility, perhaps choſen for its paradoxical appearance, does not give us a clear notion of the characteriſtſe differences of the ſubſtances ex­amined. Thoſe rays which are ultimately moſt deflected from their direction, are ſaid to have become the moſt re­frangible by the combination of different ſubſtances, al­though, in all the particular refractions by which this effect is produced, they are leſs refracted than the violet light. We can just gather this much, that common glaſs disperſes the rays in ſuch a manner, that the ray which is in the con­fine of the green and blue occupies the middle of the priſmatic ſpectrum ; but in glaſſes, and many other ſubſtances, which are more diſpersive, this ray is nearer to the ruddy extremity of the ſpectrum. While therefore the ſtraight line RC' ( fig. 9. B ) terminates the ordinates Oo', YY', Gg', &c. which repreſent the diſperſion of common glaſs, the ordinates which expreſs the diſperſions of theſe ſubſtances are terminated by a curve paſſing through R and C', but lying below the line RC'. When therefore parallel hete­rogeneous light is made to converge to the axis of a con­vex lens of common glaſs, as happens at F in fig. 5. C, the light is diſperſed, and the violet rays have a ſhorter fo­cal diſtance. If we now apply a concave lens of greater diſpersive power, the red and violet rays are brought to one focus F' ; but the green rays, not being ſo much refracted away from F, are left behind at φ, and have now a ſhorter focal diſtance. But Dr Blair afterwards found that this was not the caſe with the muriatic acid, and ſome ſolutions in it. He found that the ray which common glaſs cauſed to occupy the middle of the ſpectrum was much nearer to the blue extremity when refracted by theſe fluids. There­fore a concave lens formed of ſuch fluids which united the red and violet rays in F', refracted the green rays to f'.

Having obſerved this, it was an obvious conjecture, that a mixture of ſome of theſe fluids might produce a medium, whoſe action on the intermediate rays ſhould have the ſame proportion that is obſerved on common glaſs ; or that two of them might be found which formed ſpectra ſimilarly di­vided, and yet differing ſufficiently in diſperfive power to enable us to deſtroy the diſperſion by contrary refractions, without deſtroying the whole refraction. Dr Blair accord­ingly found a mixture of ſolutions of ammoniacal and mer­curial ſalts, and also some other ſubſtances, which produced diſperſions proportional to that of glaſs, with reſpect to the different colours.’

And thus has the reſult of this intricate and laborious investigation corresponded to his utmoſt wiſhes. He has pro­duced achromatic teleſcopes which ſeem as perfect as this thing will admit of ; for he has been able to give them ſuch apertures, that the *incorrigible* aberration arising from the ſpherical surfaces becomes a ſenſible quantity, and precludes farther amplification by the eye-glaſſes. We have exami­ned one of his teleſcopes : The focal diſtance of the object- glaſs did not exceed 17 inches, and the aperture was fully 31/2 inches. We viewed some single and double ſtars and ſome common objects with this teleſcope ; and found, that in magnifying power, brightneſs, and diſtinctneſs, it was manifeſtly ſuperior to one of Mr Dollond’s of 42 inches fo­cal length. It alſo gave us an opportunity of admiring the dexterity of the London artiſts, who could work the glasses with ſuch accuracy. We had moſt diſtinct viſion of a ſtar when uſing an erecting eye piece, which made this teleſcope magnify more than a hundred times ; and we found the field of viſion as uniformly diſtinct as with Dollond’s 42 inch teleſcope magnifying 46 times. The intelligent reader muſt admire the nice figuring and centering of the very deep eye-glaſſes which are neceſſary for this amplification.

It is to be hoped that Dr Blair will extend his views to *glaſſes* of different compoſitions, and thus give us object- glaſſes which are ſolid ; for thoſe compoſed of fluids have inconveniences which will hinder them from coming into general use, and will confine them to the muſeums of philoſophers. We imagine that antimonial glaſſes bid fair to anſwer this purpoſe, if they could be made free of colour, ſo as to tranſmit enough of light. We recommend this diſſertation to the careful peruſal of our readers. Thoſe who have not made themſelves much acquainted with the delicate and abſtruſe theory of aberrations, will find it exhibited in ſuch a popular form as will enable them to underſtand its general aim ; and the well-informed reader will find many curious indications of inquiries and diſcoveries yet to be made.

We now proceed to conſider the eye-glaſſes or glaſſes of teleſcopes. The proper conſtruction of an eye-piece is not leſs eſſential than that of the object-glaſs. But our limits will not allow us to treat this ſubject in the ſame detail, We have already extended this article to a great length, becauſe we do not know of any performance in the English language which will enable our readers to underſtand the conſtruction of achromatic teleſcopes ; an invention which reflects honour on our country, and has completed the diſ­coveries of our illuſtrious Newton. Our readers will find abundant information in Dr Smiths Optics concerning the eye-glaſſes, chiefly deduced from Huyghen’s fine theory of aberration @@(a). At the ſame time, we muſt again pay Mr

@@@(a) While we thus repeatedly ſpeak of the theory of ſpherical aberration as coming from Mr Huyghens, we muſt not