parabolic, propoſed by Haaſe, ſeem to merit conſideration. But if we examine them merely as reflectors of echoes, we ſhall find them inferior to the conical.

With reſpect to the hyperbolic trumpet, its inaptitude is evident at firſt sight. For it muſt dissipate the echoes more than a conical trumpet Indeed Mr Cassegrain proceeds on quite different principles, depending on the mechaniſm of the aerial undulations : his aim was to increase the agitation in each pulſe, ſo that it may make a more for­cible impulſe on the ear. But we are too imperfectly ac­quainted with this ſubject to decide *a priori ;* and expe­rience ſhows that the hyperbola is not a good form.

With reſpect to the parabolic trumpet, it is certain that if the mouth-piece were but a point, it would produce the moſt favourable reflection of all the sounds ; for they would all proceed parallel to the axis. But every point of an open mouth muſt be conſidered as a centre of sound, and none of it muſt be kept out oſ the trumpet. If this be all ad­mitted, it will be found that a conical trumpet, made by the preceding rules, will diſſipate the reflected sounds much leſs than the parabolic.

Thus far have we proceeded on the fair conſequences oſ the well known fact, that echoes are reflected in the same manner as light, without engaging in the intricate inveſtigation of aerial undulations. Whoever conſiders the New­tonian theory of the propagation of sound with intelligence and attention, will ſee that it is demonſtrated ſolely in the caſe of a single row of particles ; and that all the general corollaries reſpecting the lateral diffusion of the elaſtic un­dulations are little more than ſagacious guesses, every way worthy of the illuſtrious author, and beautifully confirmed by what we can moſt diſtinctly and accurately obſerve in the circular waves on the ſurface of ſtill water. But they are by no means fit for becoming the foundation of any doctrine which lays the ſmalleſt claim to the title of accurate ſcience. We really know exceedingly little of the theory of aerial undulations ;.and the conformity of the phenomena of sound to theſe gueſſes of Sir Iſaac Newton has always been a matter of wonder to every eminent and candid ma­thematician : and no other ſhould pretend to judge of the matter. This wonder has always been acknowledged by Daniel Bernoulli ; and he is the only person who has made any addition to the ſcience of sounds that is worth men­tioning. For ſuch we muſt always eſteem his doctrine of the ſecondary undulations of muſical cords, and the ſecondary pulſes of air in pipes. Nothing therefore is more unwarrant­able, or more plainly ſhows the precipitant preſumption of modern ſcioliſts, than the familiar uſe of the general theory of aerial undulations in their attempts to explain the abſtruſe phenomena of nature (ſuch as the communication of sensation from the organ to the ſensorium by the vibrations of a nervous fluid, the reciprocal communication of the volitions from the ſensorium to the mulcle, nay, the whole pheno­mena of mind), by vibrations and vibratiunculæ.

Such attempts equally betray ignorance, preſumption, and meanneſs of soul. Ignorance of the extent to which the Newtonian theory may be logically carried, is the neceſſary conſequence of ignorance of the theory itſelf. It is preſumption to apply it to the phenomena of the intel­lectual world ; and ſurely he has an abject soul who hugs and cheriſhes the humble thought, that his mind is an un­dulating fluid, and that its all-graſping comprehension, and all its delightful emotions, are nothing more than an etherial tune. “ Pol me occidiſtis amentes.” This whim is older than Hartley : It may be found in Robinet’s *Systeme de la Nature.* This by the by made its firſt appearance as a diſcourſe delivered by Brother Orateur in the lodge of the grand Orient at Lyons ; from which source have proceeded all the coſmopolitical ſocieties in Europe, and that illumi­nation by which reaſon is to triumph over revelation, and liberty and equality over civil government. We crave par­don oſ our readers for this ebullition of ſpleen ; and we hope for it from all thoſe who can read Newton, and who eſteem his modeſty.

Thoſe who have endeavoured to improve the ſpeaking trumpet on mechanical principles, have generally aimed at increaſing the violence of the elaſtic undulations, that they may make a more forcible impulſe on the ear. This is the object in view in the parabolic trumpet. All the undu­lations are converted into others which are in planes perpen­dicular to the axis of the inſtrument ; ſo that the ſame little maſs of air is agitated again and again in the ſame direction. From this it is obvious to conclude, that the total agitation will be more violent. But, in the firſt place, theſe violent agi­tations muſt diffuse themſelves laterally as soon as they get out of the trumpet, and thus be weakened, in a proportion that is perhaps impossible for the moſt expert analyſt to determine. But, moreover, we are not ſufficiently acquaint­ed with the mechaniſm of the very firſt agitations, to be able to perceive what conformation of the trumpet will cauſe the reflected undulations to increaſe the firſt undulations, or to check them. For it muſt happen, during the production of a continued sound in a trumpet, that a parcel of air, which is in a ſtate of progressive agitation, as it makes a pulſe of one sound, may be in a ſtate of retrograde agita­tion, as it is part of a pulſe of air producing another sound. We cannot (at leaſt no mathematician has yet done it) diſcriminate, and then combine theſe agitations, with the intel­ligence and preciſion that are necessary for enabling us to say what is the ultimate accumulated effect. Mr Lambert therefore did wiſely in abſtaining from this intricate inveſtigation ; and we are highly obliged to him for deducing such a body of demonſtrable doctrine from the acknow­ledged, but ill underſtood, fact of the reflection of echoes.

We know that two sounds actually croſs each other with­out any mutual diſturbance ; for we can hear either of them diſtinctly, provided the other is not ſo loud as to ſtun our ears, in the same manner as the glare of the sun dazzles our eyes. We may therefore depend on all the conſe­quences which are legitimately deduced from this fact, in the same manner as we depend on the ſcience of catoptrics, which is all deduced from a fact perfectly ſimilar and as little underſtood.

But the preceding propositions by no means explain or comprehend all the reinforcement of sound which is really obtained by means of a ſpeaking trumpet. In the firſt place, although we cannot tell in what degree the aerial undulations are increaſed, we cannot doubt that the reflec­tions which are made in directions which do not greatly de­viate from the axis, do really increaſe the agitation of the particles of air. We ſee a thing perfectly ſimilar to this in the waves on water. Take a long slip of lead, about two inches broad, and having bent it into the form of a parabola, ſet it into a large flat trough, in which the water is about an inch deep. Let a quick ſucceſſion of ſmall drops of water fall preciſely on the focus of the parabola. We ſhall ſee the circular waves proceeding from the focus all converted into waves perpendicular to the axis ; and we ſhall fre­quently ſee theſe ſtraight waves conſiderably augmented in their height and force. We ſay generally, ſor we have ſometimes obſerved that theſe reflected waves were not ſenſibly ſtronger than the circular or original waves We do not exactly know to what this difference muſt be aſcribed : we are dispoſed to attribute it to the frequency of the drops. This may be such, that the interval of time between each drop is preciſely equal, or at leaſt commenſurable, to the