legislators as well as the people. A Captain drives the stage-waggon, and it puts up at the house of a Colonel;—rank therefore becomes ridiculous. When the country became independent, it had no race of educated men to fill those situations which used to be respected; and they ceased to be so when the persons who filled them were no longer respectable. This evil might soon be remedied; a generation is sufficient to educate judges and magistrates. The spirit of gambling has produced more lasting injury. It is not confined to their speculations in law, by which so many emigrants have been duped and ruined; it extends to their commercial dealings, and the American merchants have a worse character than those of any other nation.

This is an unfavourable picture, yet surely not an unfair one, nor has it been drawn by an unfriendly hand. Let but the American government abstain from war, and direct its main attention to the education of the people and the encouragement of arts and knowledge, and in a very few generations their country may vie with Europe. Above all, let not that Anti-Anglican spirit be cherished, for which there no longer exists a cause. With whatever indignation they may think of the past, they ought to remember that it was from England they imbibed those principles for which they fought and by which they triumphed. There is a sacred bond between us of blood and of language, which no circumstances can break. Our literature must always continue to be theirs, and though their laws are no longer the same as ours, we have the same Bible, and we address our common Father in the same prayer. Nations are too ready to admit that they have natural enemies; why should they be less willing to believe that they have natural friends?

ART. X. *Sur la Loi de la Réfraction extraordinaire dans les Cristaux diaphanes. Par M. Laplace. Lu à la première Classe de l' Institut, dans sa séance du* 30 *Janvier,* 1809. Journal de Physique, Janv. 1809.

THE few who have arrived, in the different departments of learning and science, at such a degree of eminence, as to be almost 'without a second, and without a judge,' have not only the advantage of being able to propagate real knowledge with uncontrolled authority, but also the less enviable prerogative of giving to error the semblance of truth, whenever accidental haste or inattention may have led them into those inaccuracies, from which no human intelligence can be wholly exempt. It

It is necessary therefore for a critic, who undertakes to make a faithful report of the progressive advancement of the sciences, to watch with redoubled care the steps of those, who are the most likely to lead others astray, if they happen to follow a wrong path; and while the ultimate decision always remains with the public, as with a jury, the judge is bound to state, as fully and impartially as possible, the whole mass of the evidence before him; not fearing to adduce all such reasoning as can tend to the support of the weaker side, when there is any danger of its being oppressed by the authority and respectability of the stronger.

These reflections have been suggested to us by an essay, for which we are indebted to a very celebrated continental mathematician; a man of whom we willingly say, with Heraclitus, εἷς ἐμοὶ ἄνθρωπος τρισμύριοι, but on whose works we thought it necessary, on a former occasion, to make some free remarks. We then objected to him a want of address or of perseverance in the management of his calculations, presuming that the principles, on which they were founded, were capable of being applied, with much greater precision, to the phenomena in question: our suspicion has since that time been justified by an essay of an anonymous author in this country, who, without any great parade of calculation, appears to have afforded us a general and complete solution of the problem, which Mr. Laplace had examined in particular cases only. We have now to accuse him of an offence of a different complexion: that is, the hasty adoption of a general law, without sufficient evidence; and an inversion of the method of induction, equally unwarrantable with any of the paralogisms of the Aristotelian school. We complain also, on national grounds, of an unjustifiable want of candour, in not allotting to the observations of different authors their proper share of originality. What has a man of science to expect from the public, as a reward for his labours, but the satisfaction of having it acknowledged, that he has done something of importance towards extending the sphere of intellectual acquirements? And who is so capable of directing public opinion, on subjects respecting which very few will form an opinion of their own, as a philosopher like Mr. Laplace, whose works are sure of commanding universal attention, and almost sure of inforcing implicit belief? The Huygenian law, of the extraordinary refraction of Iceland crystal, has lately, he says, been confirmed by 'Mr. Malus.' We know nothing of the extent of Mr. Malus's researches, but we know that Mr. Laplace sometimes reads the Philosophical Transactions, and he either must have seen, or ought to have seen, a paper published in them by Dr. Wollaston, as long ago as the year

year 1802, which completely establishes the truth of the law in question, on the most unexceptionable evidence, and by the most accurate experiments. But it seems to be one of the attributes of a great nation, to disregard, on all convenient occasions, the rights of its neighbours: we might have made the same remark in our former criticism on Mr. Laplace, but there is so little novelty in the circumstance, that it is unnecessary to dwell any further on it at present.

It has long been known to opticians, that many crystals, of different kinds, have the remarkable property of making substances, viewed through them in certain directions, appear double; the effect of their refraction being almost the same, as if a rarer and a denser medium existed together in the same space; some part of the light passing through them being refracted in the same manner as if the denser medium alone were present, and some as if the rarer only were concerned. The reason of this double refraction is wholly unknown: nor has any attempt been hitherto made to discover it. The crystals of carbonate of lime, in their primitive form, have also a further peculiarity: they afford a double image, even when the objeet is viewed perpendicularly through the two opposite and parallel sides of a crystal; an effect which could never arise from the combination of any two mediums acting in the ordinary manner: in fact, one of the images only is seen according to the laws of ordinary refraction, and the place of the other is determined by a law, which is the subject of the present paper. This law was experimentally demonstrated, and very elegantly applied to the phenomena by its first discoverer Huygens; but having been suggested to him by an hypothesis which was not universally adopted, it was rejected or neglected by his antagonists, without any accurate investigation; and the testimony of the greatest philosopher of that age, or of any age, having been opposed to it, it remained forgotten for almost a century. Nor is this the only instance in which, even within the limits of the physical sciences, high authority has been suffered to prevail against unassuming truth. Mr. Haüy is the first of the later observers, who remarked, that the true law of extraordinary refraction was much nearer to the Huygenian law, than to that which had been substituted for it by Newton. Some time afterwards, Dr. Wollaston had made a number of very accurate experiments, with an apparatus singularly well calculated to examine the phenomena; but he could find no general principle to connect them, until the work of Huygens was pointed out to him: he was then enabled, by means of the Huygenian law, to reduce his experiments to a comparison with each other; and in communicating them to the Royal Society, he remarked that 'the oblique refraction, when

when considered alone, seemed to be nearly as well explained as any other optical phenomena.' Here the matter rested, until Mr. Malus made the experiments which have led to the present paper.

'Mr. Malus has lately compared the Huygenian law,' says Mr. Laplace, 'with a very great number of experiments, made with extreme precision, on the natural and artificial surfaces of the crystal, and has found that the law agrees exactly with his experiments, so that it must be placed among the most certain, as well as among the most striking results of physical observation. Huygens had deduced it, in a very ingenious manner, from his hypothesis respecting the propagation of light, which he imagined to consist in the undulations of an ethereal fluid. This great geometrician supposed the velocity of the undulations in the ordinary transparent mediums to be smaller than in a vacuum, and to be equal in every direction: in the Iceland crystal, he imagined two distinct species of undulations; the velocity of the one being the same in all directions, in the other variable, and represented by the radii of an elliptic spheroid, having the point of incidence for its centre, and its axis being parallel to that of the crystal; that is, to the right line which joins the two obtuse solid angles of the rhomboid. Huygens does not assign any cause for this variety of undulations; and the singular phenomena, exhibited by the light which passes from one portion of the crystal into another, are *inexplicable* upon his hypothesis. This circumstance, together with the great difficulties presented by the undulatory theory of light in general, has induced the greater number of natural philosophers to reject the law of refraction founded on the Huygenian system. But since experiments have demonstrated the accuracy of this remarkable law, it must be entirely separated from the hypothesis which originally led to its discovery. It would be extremely interesting to reduce it, as Newton has reduced the law of ordinary refraction, to the action of attractive or repulsive forces, of which the effects are only sensible at insensible distances; it is indeed very probable that it depends on such an action, as *I have satisfied myself* by the following considerations.

'It is well known that the principle of the least possible action takes place, *in general*, with respect to the motion of a material point actuated by forces of this kind. In applying this principle to the motion of light, we may omit the consideration of the minute curve, which it describes, in its passage from a vacuum into the transparent medium, and suppose its velocity constant, when it has arrived at a sensible depth. The principle of the least action is then reduced to the passage of the light from a point without to a point within the crystal, in such a manner, that if we add the product of the right line described without into its primitive velocity, to the product of the right line described within the crystal, into its corresponding velocity, the sum may be a minimum. This principle always gives the velocity of light in a transparent medium, when the law of refraction

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tion is known, and on the other hand, gives this law, when we know the velocity. But there is a *condition*, which becomes necessary in the case of extraordinary refraction, which is, that the velocity of the ray of light in the medium must be *independent of the manner in which it has entered it*, and must be determined only by its situation with respect to the axis of the crystal, that is, by the angle which the ray forms with a line parallel to the axis.' '*I have found* that the law of extraordinary refraction, laid down by Huygens, satisfies this condition, and agrees at the same time with the principle of the least action; so that *there is no reason to doubt that it is derived from the operation of attractive and repulsive forces*, of which the action is only sensible at insensible distances. The expression of the velocity to which my analysis *has conducted me*, affords a *valuable datum* for determining the nature of these forces; this velocity being measured by a fraction, of which the numerator is unity, and the denominator the radius of the spheroid which is described by the light, the velocity in a vacuum being considered as unity. The velocity of the ordinary ray, in the crystal, is equal to unity divided by the principal axis of the spheroid, and is consequently greater than that of the extraordinary ray: the difference of the squares of the two velocities being proportional to the square of the sine of the angle which the latter ray makes with the axis; and this difference represents that *of the actions of the crystal* on the two kinds of rays. According to Huygens, the velocity of the extraordinary ray, in the crystal, is simply expressed by the radius of the spheroid; consequently, his hypothesis *does not agree* with the principle of the least action: but *it is remarkable* that it agrees with the principle of Fermat, which is, that light passes, from a given point without the crystal, to a given point within it, in the least possible time; for it is easy to see that this principle coincides with that of the least action, if we invert the expression of the velocity. Thus both of these principles lead us to the law of extraordinary refraction discovered by Huygens, provided that, for Fermat's principle, we take, with Huygens, the radius of the spheroid as representing the velocity, and, for the principle of the least action, this radius be made to represent the time employed by the light in passing through a given space.' 'If the diameters of the spheroid are equal, the figure becomes a sphere, and the refraction resembles ordinary refraction; so that in these phenomena, nature, in proceeding from what is simple to that which is more complex, *takes the form of the ellipsis* next to that of the circle, as in the motions and the figures of the heavenly bodies.'

Mr. Laplace then gives an account of the controversy between Descartes and Fermat respecting the velocity of light, and concludes his abstract with the following remarks.

'Maupertuis, convinced by the arguments of Newton, of the truth of the suppositions of Descartes, found that the function which is a

minimum in the motion of light, is not, as Fermat supposed, the sum of the quotients, but that of the products of the spaces described, by the corresponding velocities. This result, extended to the fluent of the product of the fluxion of the space into the velocity, where the motion is variable, suggested to Euler the principle of the least action, which Mr. de Lagrange afterwards deduced from the primitive laws of motion. The use which I have now made of this principle, first in order to *discover* whether or no the law of extraordinary refraction laid down by Huygens *depends on attractive or repulsive forces*, and thus to *raise it* into the rank of those laws which are mathematically accurate, and, secondly, to deduce mutually *from each other* the laws of refraction and of the velocity of light in transparent mediums, appears to me to be worthy *the attention* both of natural philosophers and of mathematicians.'

Such is Mr. Laplace's own account of the investigations, into which he has been led by Mr. Malus's experiments; and we shall give him full credit for having demonstrated, in the original memoir, every thing which he has here asserted.

The principle of Fermat, although it was assumed by that mathematician on hypothetical, or even imaginary grounds, is in fact a fundamental law with respect to undulatory motion, and is explicitly the basis of every determination in the Huygenian theory. The motion of every undulation must necessarily be in a direction perpendicular to its surface; and this condition universally includes the law, that the time occupied in its propagation between two given points must be a minimum; or rather, more generally, the effects of the collateral undulations must always conspire the most completely, where the time occupied in their arrival at two neighbouring points in the direction of the undulations is equal, which is necessarily a condition of a mininum. Mr. Laplace seems to be unacquainted with this most essential principle of one of the two theories which he compares; for he says, that 'it is remarkable,' that the Huygenian law of extraordinary refraction agrees with the principle of Fermat; which he would scarcely have observed, if he had been aware that the law was an immediate consequence of the principle.

In the second place, the law of the least action is precisely the same with the law of Fermat, excepting the difference of the interpretation of the symbols. In the law of Fermat, the space is divided by the velocity, to find the time: in the principle of the least action, instead of dividing by the velocity, estimated in the Huygenian manner, we multiply by its reciprocal, to which we give the name of velocity, upon a different supposition: but the mathematical conditions of the two determinations

minations are always necessarily identical; and the law of the least action must always be applicable to the motions of light, as determined by the Huygenian theory, supposing only the proportion of the velocities to be simply inverted.

Mr. Laplace has therefore given himself much trouble to prove that coincidence in a particular case, which must necessarily be true in all possible cases. In a person who seems to delight in long calculations, this waste of labour may easily be excused. A Turk laughs at an Englishman for walking up and down a room when he could sit still; but Mr. Laplace may walk about, and even dance, as much as he pleases, in the flowery regions of algebra, without exciting our smiles, provided that he does no worse than return to the spot from which he set out: but when, in the rapidity of his motion, his head begins to turn, it is time for the spectators to think of their own safety.

Not satisfied with his important discovery, that the extraordinary refraction is consistent with the principle of the least action, he proceeds to infer, that 'there is no reason to doubt' that this refraction *depends* on the immediate operation of attractive and repulsive forces. With as much reason might it be asserted, that because the sound produced by a submarine explosion is, in all probability, regularly refracted at its passage into the air, the sound must be attracted by the air, or repelled by the water.

Nor would such a conclusion be by any means *equally* unwarrantable with that which Mr. Laplace has drawn; a simple attractive or repulsive force, acting on a projected corpuscle in a direction perpendicular to the surface of the water, would be sufficient to explain such a refraction; but Mr. Laplace has not attempted to describe the kind of force which would be capable of producing the effects in question with respect to light. He contents himself with saying, that the velocity within the crystal must depend only on the situation of the ray of light with respect to the axis, and that this is a necessary 'condition' of the refraction. The musician, celebrated by the epigrammatist, thought it 'a necessary condition' that a string and its octave should vibrate together, because the materials of both strings were taken from the same sheep; and he applauded himself on the sufficiency of his explanation with about as much justice as our author. In fact, the deduction of this 'condition,' from any assignable laws of attraction, is *the only difficulty* in the question; and this is the 'dark passage' which the 'commentators' have shunned.

But the insertion of such a condition seems even to exempt the problem from being directly amenable to the law of the least action.

action. We apprehend that this law is only demonstrable, from mechanical principles, in cases of the operation of attractive forces directed to a certain point, whether fixed or variable, or acting in parallel lines, so that the velocity, between the same parallel or concentric surfaces, may be always the same, whatever its direction may be: it cannot therefore be applied, without the most unjustifiable violence, to cases in which the velocity deviates most essentially from this description.

When we consider that, upon such grounds as these, a mathematician of the first celebrity professes to have elevated the principle of Huygens ‘ to the dignity of a rigorous law,’ we cannot help being reminded of his Egyptian predecessor, who had ‘ spent forty years in unwearied attention to the motions and appearances of the celestial bodies, and had drawn out his soul in endless calculations,’ in order to be persuaded at last, that ‘ the sun had listened to his dictates, and had passed from tropic to tropic by his direction; that the clouds, at his call, had poured their waters, and the Nile overflowed at his command.’

Mr. Laplace very justly remarks, that nature, in these phenomena, as well as in those of astronomy, has *taken* the form of the ellipsis next to that of the circle. But in astronomy, we know *why* nature ‘ has taken the form of the ellipsis,’ since the elliptic form depends on the simple law of the variation of the force of gravitation: in these phenomena of extraordinary refraction, on the contrary, no satisfactory attempt has been made to obtain any such simplification. A solution of this difficulty might, however, be deduced, upon the Huygenian principles, from the simplest possible supposition, that of a medium more easily compressible in one direction than in any direction perpendicular to it, as if it consisted of an infinite number of parallel plates connected by a substance somewhat less elastic. Such a structure of the elementary atoms of the crystal may be understood by comparing them to a block of wood or of mica. Mr. Chladni found that the mere obliquity of the fibres of a rod of Scotch fir reduced the velocity, with which it transmitted sound, in the proportion of 4 to 5. It is, therefore, obvious that a block of such wood must transmit every impulse in spheroidal, that is oval, undulations: and it may also be demonstrated, as we shall show at the conclusion of this article, that the spheroid will be truly elliptical, when the body consists either of plane and parallel strata, or of equidistant fibres, supposing both to be extremely thin, and to be connected by a less highly elastic substance; the spheroid being in the former case oblate, and in the latter oblong. It may also be proved, that while a complete spheroidal undulation is every where propagated by the motion of

of the particles in a direction perpendicular to its surface, a detached portion, like a beam of light or of sound, will proceed obliquely, in the rectilinear direction of a diameter.

It has often been asserted, and Mr. Laplace repeats the charge, that the phenomena, which are observable upon the transmission of light through a second portion of the crystal, are 'inexplicable' upon the Huygenian theory. It is true that they have not yet been explained; but what right has Mr. Laplace to suppose, that this theory has yet attained to its utmost degree of perfection in every other respect, under all the obloquy with which it has been loaded? Had the more prevailing system afforded anything like an explanation of the perfect ellipticity of the undulations, it would have been opprobriously objected to the Huygenian system, that it was incapable of accounting for this circumstance; and the reproach would have remained hitherto unanswered. It may, however, be observed, that an undulation, which has passed through a crystal, is not, as some authors have taken for granted, alike on all sides; nor can it be proved, that the difference of its curvature, in its different sections, may not be sufficient to produce all the observable modifications of its subsequent subdivision.

These considerations, we trust, will amply justify us in giving it as our opinion, that Mr. Laplace has, in this memoir, been not a little superficial in his arguments, and extremely precipitate in his conclusions. We must again lament the serious evils which are likely to arise, and which in this case have actually arisen, from that unfortunate 'rage for abstraction,' which we have already noticed as too universally prevalent. 'To avoid such paralogisms and such whims,' said the late Professor Robison on a similar occasion, 'we are convinced that it is prudent to deviate as little as possible, in our discussions, from THE GEOMETRICAL METHOD.'

The proposition, which we left to be demonstrated, was this: 'an impulse is propagated through every perpendicular section of a lamellar elastic substance in the form of an elliptic undulation.' The want of figures will, perhaps, render the demonstration somewhat obscure, but the deficiency may easily be supplied by those who think it worth their while to consider the subject attentively.

'When a particle of the elastic medium is displaced in an oblique direction, the resistance, produced by the compression, is the joint result of the forces arising from the elasticity in the direction of the laminæ, and in a transverse direction: and if the elasticities in these two directions were equal, the joint result would remain proportional to the displacement of the particle, being expressed, as well in magnitude as in

in direction by the diagonal of the parallelogram, of which the sides measure the relative displacements, reduced to their proper directions, and express the forces which are proportional to them. But when the elasticity is less in one direction than in the other, the corresponding side of the parallelogram expressing the forces must be diminished, in the ratio which we shall call that of 1 to m; and the diagonal of the parallelogram will no longer coincide in direction with the line of actual displacement, so that the particle displaced will also produce a lateral pressure on the neighbouring particle of the medium, and will itself be urged by a lateral force. This force will, however, have no effect in promoting the direct propagation of the undulation, being probably employed in gradually changing the direction of the actual motions of the successive particles; and the only efficient force of elasticity will be that which acts in the direction in which the undulation is advancing, and which is expressed by the portion of the line of displacement, cut off by a perpendicular falling on it from the end of the diagonal of the parallelogram of forces; and the comparative elasticity will be measured by this portion, divided by the whole line of displacement. Calling the tangent of the angle formed by the line of displacement with the line of greatest elasticity t, the radius being 1, the force in this line being also 1, the transverse force will be expressed by $m\,t$, the line of displacement by $\sqrt{(1+tt)}$, its diminution by $\frac{(1-m)\,tt}{\sqrt{(1+tt)}}$, the diminished portion, which measures the force, by $\sqrt{(1+tt)}-\frac{(1-m)\,tt}{\sqrt{(1+tt)}}$, and the elasticity, in the given direction, by $\frac{1+m\,tt}{1+tt}$. Hence it follows, that the velocity of an impulse, moving in that direction, will be expressed by $\sqrt{\frac{1+m\,tt}{1+tt}}$.

'It is next to be proved, that the velocity of an elliptical undulation, increasing so as to remain always similar, by means of an impulse propagated always in a direction perpendicular to the circumference, is such as would take place in a medium thus constituted. It is obvious that the increment of each of the diameters of the increasing figure must be proportional to the whole diameter; and this increment, reduced to a direction perpendicular to the curve, will be proportional to the perpendicular falling on the conjugate diameter, which will measure the velocity. We are therefore to find the expression for this perpendicular, when it forms an angle with the greater axis, of which the tangent is t. Let the greater semi-axis be 1, and the smaller n: then the tangent of the angle, formed with the greater axis by the conjugate diameter, being $\frac{1}{t}$; the tangent of the angle subtended by the corresponding ordinate of the circumscribing circle is found $\frac{1}{nt}$, and the semi-diameter itself, equal to unity,

unity, reduced in the ratio of the secants of these angles, that is, to $n\sqrt{\frac{1+tt}{1+nntt}}$; but, by the known property of the ellipsis, the perpendicular required is equal to the product of the semi-axes divided by this semi-diameter, that is, to $\sqrt{\frac{1+nntt}{1+tt}}$: we have, therefore, only to make $nn=m$, and the velocity in the given medium will always be such as is required for the propagation of an undulation, preserving the form of similar and concentric spheroids, of which the given ellipsis represents any principal section.

'If the whole of the undulation were of equal force, this reasoning would be sufficient for determining its motion; but when one part of it is stronger than another, this superiority of pressure and motion will obviously be propagated in the direction of the actual resistance produced by the displacement of the particles, since it is this resistance which carries on the pressure, and consequently propagates the motion. It is very remarkable, that the direction of the resistance will be found, on the supposition which we have advanced respecting the constitution of the medium, to coincide every where with the diameters of the ellipsis, when the displacement is perpendicular to the surface. For it is proved by authors on conic sections, that the subnormal of the ellipsis is to the abscis, as the square of the lesser axis is to the square of the greater, that is, in this case, as nn to 1, or as m to 1; but if we divide the ordinate in the same ratio of m to 1, and join the point of division with the extremity of the subnormal, this line, which will evidently be parallel to the diameter, will express, as we have already seen, the direction of the force, when the normal represents that of the displacement. An immediate displacement in the direction of any diameter, making an angle with the axis of which the tangent is t, would give a velocity of $\sqrt{\frac{1+mtt}{1+tt}}$, while the increment of the diameter would require a velocity of $\sqrt{\frac{m+mtt}{m+tt}}$, which does not vary in the same proportion. It must however be remembered, that the rectilinear direction of the beam is not supposed to depend on this circumstance alone: Huygens considers each point of the surface of the crystal, on which a beam of light impinges, as the centre of a new undulation, which spreads, in some measure, in every direction, but produces no perceptible effect, except where it is supported by, and co-operates with, the neighbouring undulations; that is, in the surface which is a common tangent of the collateral undulations; but if this principle were applied without the assistance of the obliquity of force, which we have deduced from the supposition of a stratified medium, it would lead us to expect that the elementary impulses, being propagated in a curvilinear trajectory, might be intercepted by an object not situated in

in the rectilinear path of the beam; a conclusion which is not warranted by experiment.'

It is not probable that any other supposition respecting the constitution of the medium, in the Huygenian theory, could afford a result so strikingly coincident with the phenomena of extraordinary refraction; and the most decided advocates of the projectile system must allow, that there is scarcely a chance, especially after Mr. Laplace's fruitless researches, of its being capable of an application by any means comparable to this for precision and simplicity. But it must be remembered, that we have been considering a single class of phenomena only; the two rival theories must be viewed in a multiplicity of various lights, before a fair estimate can be candidly formed of their comparative merits; and we are not arguing for a decision in favour of either, but for a temperate suspension of judgment, until more complete and more satisfactory evidence can be obtained.*

ART. XI. *William Tell, or Swisserland Delivered.* By the Chevalier de Florian, &c. *A posthumous Work. To which is prefixed a Life of the Author,* by Jauffret. *Translated from the French.* By William B. Hewetson, Author of the Blind Boy, &c. London: Sherwood and Co. 1809. 12mo. pp. 115.

FEW readers of French are unacquainted with the works of Florian. His style, at once elegant and easy of construction, has universally recommended him to the teachers of the language, and Telemachus is commonly succeeded or supplanted by Numa. Gonsalve de Cordoue, Estelle, and Galathée are stock-books in all the circulating libraries, and the Tales of Florian are almost as generally read as those of Voltaire and Marmontel. He possesses indeed very great attractions for the lovers of light reading. His narrative is spirited and interesting. Love, Friendship, and Heroism are his themes, and he commonly descants upon them with that genuine warmth which results from the combination of sensibility with genius.

Though he never reaches that full power of pathos which characterizes some of the sentimental writers of the French school, he

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* We must do Mr. Laplace the justice to observe, that since this article was written, he has published, in the Memoirs of Arcueil, another paper on this subject, in which the name of Dr. Wollaston is mentioned with due respect. The same volume contains also an account of some highly interesting and important experiments of Mr. Malus, on the apparent polarity of light, as exhibited by oblique reflexion, which present greater difficulties to the advocates of the undulatory theory, than any other facts with which we are acquainted.

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