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DIDEROT'S EARLY
PHILOSOPHICAL WORKS

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LETTER ON THE BLIND FOR THE USE OF THOSE WHO SEE¹

Possunt nec posse videntur.—*Æneid*, lib. v, 23.²

IT was not more than I suspected, that the blind girl whom Monsieur de Réaumur had couched for cataract would not inform you of what you were anxious to know ; but I little thought it would be neither her fault nor yours. I have in person, and by means of his best friends and by paying him many compliments, applied to her benefactor, but all in vain ; the first dressing will be removed without you. Some persons of the highest distinction have had the honour of sharing this refusal with philosophers, and, in a word, he does not wish to remove the veil, except in the presence of some eye-witnesses of no great importance. If you would know why that wonderful operator makes a secret of experiments at which you think too great a number of intelligent witnesses cannot be present, my answer is, that the observations of such a celebrated person do not so much stand in need of spectators, whilst making, as of hearers when made.

¹ The *Letter* was addressed to Madame de Puisieux.—(A)

² [The original is : *Possunt quia possunt videntur*—“They succeed because they think they will succeed.”]

Thus, disappointed, madam, I have returned to my original intention, and, since I was forced to go without an experiment in which I saw little profit would accrue to you or to me, but of which Monsieur de Réaumur will doubtless make a much better use, I set to work to philosophise with my friends upon the important matter which is the object of it. How happy should I be, if the narrative of one of our conversations might stand instead of the spectacle I so rashly promised you! The day that the Prussian¹ operated on Simoneau's daughter for cataract, we went to have some talk with the Puisaux² man who was born blind. He is possessed of good solid sense, is known to great numbers of persons, understands a little chemistry, and has attended the botanical lectures at the Jardin du Roi with some profit to himself. His father was a distinguished professor of philosophy at the University of Paris. He had private means, sufficient to have satisfied his remaining senses, but a taste for pleasure led him into some excesses in his youth; people took advantage of his weaknesses, his affairs became embarrassed, and finally he withdrew to a little town in the provinces, from whence he pays a yearly visit to Paris, bringing with him liqueurs which give great satisfaction. These, madam, are not very philosophic details, but for that very reason are likely to convince you that the person I am speaking of is not imaginary.

¹ Hülmer, a Prussian oculist.—(Br)

² A small town in the Gâtinais.—(D)

We arrived at our blind man's house at five o'clock in the afternoon, and we found him teaching his son to read with raised letters. He had only been up an hour, for I must tell you that day begins for him when it is ending for us. His custom is to look after his household affairs and to work while others are asleep. At midnight nothing interrupts him, and he is in no one's way. His first care is to set in its place everything that has been displaced during the day, and when his wife wakes she generally finds the house tidy. The difficulty the blind have in finding things that are mislaid makes them orderly, and I have observed that their intimates also share this quality, either from the effect of the good example of the blind, or from a feeling of compassion towards them. How unhappy would the blind be without the little attentions of those about them!—nay, we ourselves feel the want of them. Great services are like the large gold or silver coins that we rarely make use of, but small attentions are small change which is always passing from hand to hand.

This blind man is a good judge of symmetry. Symmetry, which is perhaps a matter of pure convention among us, is certainly so in many respects between a blind man and the sighted. A blind man studies by his touch that disposition required between the parts of a whole to enable it to be called beautiful; and then at length attains to a just application of that term. But in saying "that is beautiful," he does not form an opinion, it is no

For the blind,
beauty is
- 7-11-17

more than repeating the judgment of those who see ; and is not this the case of three-fourths of those who give their opinion on a play or a book? Beauty for the blind is but a word when divorced from utility, and, wanting an organ, how many things are there the utility of which escapes them? Are not the blind very much to be pitied in accounting nothing beautiful unless it be likewise good? How many admirable things are lost to them! The only compensation for their loss is that their ideas of beauty, though less extensive, are more definite than those of many keen-sighted philosophers who have written prolix treatises on the subject. This blind man often speaks of mirrors. You think he does not know the meaning of the word, yet he is never known to put a glass in a wrong light. He speaks as sensibly as we on the qualities and defects of the organ which he lacks. If he attaches no idea to the terms he makes use of, yet he has the advantage over most other men that he never uses them wrongly. He speaks so wisely and so well of so many things absolutely unknown to him, that his conversation would considerably lessen the weight of that inference which, without knowing wherefore, we all draw from what passes in ourselves to what passes within the minds of others.

I asked him what he meant by a mirror? "An instrument," answered he, "which sets things in relief at a distance from themselves, when properly placed with regard to it. It is like my hand, which, to feel an object, I must not put on one side of it."

For the blind,
Beauty equals
the good.

Had Descartes been born blind, he might, I think, have hugged himself for such a definition. Pray consider what an ingenious combination of ideas it implies. This blind man's only knowledge of objects is by touch. He knows by hearing other men say so that they know objects by sight as he knows them by touch ; at any rate that is the only idea he can form of the process. He also knows that we cannot see our own face though we can touch it. Sight, he therefore concludes, is a kind of touch which extends to distant objects and is not applied to our face. Touch gives him an idea only of relief. Therefore, he concludes, a mirror is an instrument that represents us in relief outside ourselves. How many famous philosophers have laboured with less subtlety to arrive at conclusions equally erroneous ! But if a mirror astonished our blind man, how much greater was his surprise when we told him that there are instruments which magnify objects, while others remove them without duplicating them, put them out of their place, bring them nearer, remove them farther, and reveal the minutest details to the eyes of naturalists ; while others again multiply objects a thousand times, and others appear to change the figure of objects completely. He asked us a hundred curious questions concerning these phenomena. For instance, he asked us if only persons who were called naturalists could see with the microscope, and if only astronomers could see with the telescope ; if the instrument for enlarging objects were bigger than that for diminishing them ; if that which brings

them nearer were shorter than that for removing them farther off. But what puzzled him was that the other self, which according to him the mirror represents in relief, should not be tactile.

"So this little instrument," said he, "sets two senses to contradict one another; a more, perfect instrument would perhaps reconcile these contradictions, without the object being ever more real for that, and perhaps a third instrument, still more perfect and less illusory, would cause these contradictions to disappear and show us our error."

"And what are eyes, do you suppose?" asked Monsieur de —. "An organ," replied the blind man, "on which the air has the effect this stick has on my hand." That answer amazed us, and while we gazed at one another in astonishment he continued: "When I place my hand between your eyes and an object, my hand is present to you but the object is absent. The same thing happens when I reach for one thing with my stick and come across another."

Madam, only turn to Descartes' *Dioptrics*, and there you will see the ~~phenomena of sight~~ illustrated by those of touch, and the plates full of men busied in seeing with sticks. Descartes, and all the later writers, have not been able to give us clearer ideas of vision; and that great philosopher was, in this respect, no more superior to the blind man than a common man who has the use of his eyes.

No one thought of asking him questions as to



FIG. I.

The above figure is an enlarged reproduction of the cut in the original edition of the *Letter on the Blind*. In the *Discours de la méthode, plus la dioptrique, les météores, la mécanique et la musique* (Leyden, 1637), blind people trying to see with sticks are often repeated, but these are small figures only an inch in height dressed as beggars and accompanied by a dog. Diderot probably refers to an edition by P. N. Poisson of this work (1724).—(A)

painting and writing, but it is obvious that his comparison would fit in with every question, and I make no doubt but that he would have told us that to try to read or to see without eyes was like looking for a pin with a thick stick. We only talked to him about those kinds of glasses which exhibit objects in relief, and which are both so very similar to and so very different from mirrors; but these we perceived rather contradicted than coincided with his idea of a looking-glass, and he was apt to think that a painter might perhaps paint a looking-glass, and thus it came to represent objects in colours.

We saw him thread very fine needles. May I ask you, madam, to suspend your reading for a while and try what you would do in his place? In case you do not light upon any expedient, I will tell you of our blind man's. He takes the eye of the needle transversely between his lips and in the same direction as his mouth, then by his tongue and suction he draws in the thread, which follows his breath unless it is much too thick for the eye; but in that case a man with sight is in the same difficulty as the blind.

He has a surprising memory for sounds, and can distinguish as many differences in voices as we can in faces. He finds in these an infinite number of delicate gradations which escape us because we have not the same interest in observing them. For us, these shades of difference are like our own countenance. Of all the men we have seen, the one we least remember is our own self. We notice faces to

recognise people ; and if we do not remember our own, it is because we are never liable to mistake ourselves for another person or another for ourselves. Moreover, the mutual aid our senses lend stands in the way of their perfection. This will not be the only occasion where I shall have to remark upon this.

On this head our blind man said : "That he should think himself a pitiable object in wanting those advantages which we enjoy, and that he should have been inclined to consider us as superior beings had he not a hundred times found us very much inferior to him in other respects." This reflection led to another. This blind man, we said, values himself as much as, and perhaps more than, we who see. Why then, if the brute reasons (and it is scarce to be doubted), why on weighing its advantages over man as better known to it than those of man over it, should it not make a similar inference ? He has arms, perhaps says the gnat, but I have wings. He has weapons, says the lion, but have we not claws ? The elephant would look on us as insects ; and all the animals, while allowing us reason, with which we should at the same time stand in great need of their instinct, would claim that with their instinct they could do very well without our reason. We have such a strong desire to exaggerate our qualities, and make little of our defects, that it would seem man's part to write a treatise on force, and animals' on reason.

One of our company bethought him of asking our

blind man if he would like to have eyes. "If it were not for curiosity," he replied, "I would just as soon have long arms: it seems to me my hands would tell me more of what goes on in the moon than your eyes or your telescopes; and besides, eyes cease to see sooner than hands to touch. I would be as well off if I perfected the organ I possess, as if I obtained the organ which I am deprived of."

Our blind man points with such exactness at the place whence a noise comes that I make no doubt the blind may, by practice, become very dexterous and very dangerous. I will tell you a story which will convince you how imprudent it would be to stand the throwing of a stone or discharging of a pistol by a blind man, were he in the least used to that weapon. He had in his youth a quarrel with one of his brothers, who came off badly. Provoked at some insulting language, he seized the first missile which came to hand, threw it at him, and hit him directly on the forehead, so as to lay him flat on the ground.

This, with some other occurrences of the like kind, caused him to be brought before the police. The outward show of power, which affects us so strongly, is as nothing to the blind. Our blind man appeared before the magistrate, as before an equal; menaces did not intimidate him. "What will you do to me?" he asked Monsieur Hérault.¹ "I will commit you to a dungeon," answered the magistrate. "Ah, sir," the blind man replied, "I

¹ Lieutenant of police.—(Br)

have been in one for twenty-five years." There was an answer, madam ; and what a text for one who is so fond of moralising as your humble servant ! We quit life as we would a charming scene, the blind leave it as a dungeon ; and if we have more pleasure in living than he, he has less reluctance to meet his end.

The blind man of Puisaux judges of his nearness to the fire by the degrees of heat ; of the fulness of vessels by the sound made by liquids which he pours into them ; of the proximity of bodies by the action of the air on his face. He is so sensitive to the least atmospheric change, that he can distinguish between a street and a closed alley. He is an extremely good judge of the weight of bodies and the capacity of vessels ; and he has trained his arms to be such an exact balance, his fingers to be such skilful compasses, that in this kind of statics I would always back our blind man¹ against twenty persons with all their eyes about them. The smooth surface of bodies has as many shades of difference for him as the sound of voices, and there is no risk of his mistaking his wife for another, unless he was to be the gainer by the change. Yet it is very probable that among a blind people wives would be in common, or their laws against adultery must be severe indeed, so very easy would it be for wives to deceive their husbands by concerting a sign with their gallants.

¹ Clément (*Cinq années littéraires*, lettre xxxiii) chooses this passage to give his correspondent some idea of this new book of Diderot's which he describes as obscure, and in which he only finds a very slight exhibition of learning.—(A)

He judges of beauty by touch—that is easy to understand ; but what is not so easy to grasp is that his judgment is influenced by pronunciation and the sound of a voice. Anatomists ought to tell us if there is any relation between the parts of the mouth and the palate and the exterior conformation of the face. He can turn small articles on the lathe, and do needlework ; he levels with a square ; he puts together and takes to pieces simple machines. He is so far skilled in music as to play a piece when he has been told the notes and their value. He judges of the duration of time much more accurately than we by the succession of actions and of thoughts. A smooth skin, firm flesh, an elegant shape, sweet breath, charm of voice and graceful pronunciation are qualities he prizes very highly.

→ He married to have eyes of his own. Before this, he had an idea of taking a deaf man as his partner, to whom he could lend ears in exchange for eyes. I could not sufficiently wonder at his singular address in a great many things ; and on our expressing our surprise, “ I perceive, gentlemen,” said he, “ that you are not blind : you are astonished at what I do, and why not as much at my speaking ? ” There is more philosophy, I believe, in this answer of his than he was aware of. The facility with which we are brought to speak is not a little surprising. We have a number of ideas which cannot be represented by sensible objects, and which have no substance, as it were, and we are obliged to find terms for them by making use of a

number of ingenious and profound analogies observed between them and the ideas they suggest. Thus a blind man should find greater difficulty in learning to speak because there is a much larger number of imperceptible objects in his world, and thus his field for comparing and combining is much more limited. How, for example, can he rightly use the word *expression* (of countenance)? It is the same of many things imperceptible to the blind; and for us who see, it is often found hard to explain very precisely what it is. If it largely resides in the eye, touch will be useless; and what does a blind man make of dead eyes, or sparkling or expressive eyes? I infer from thence that we unquestionably derive great advantages from the concurrence of our senses and our organs; still, it would be quite another thing did we use them separately, and never employed two when one would suffice. To add touch to sight, when sight would do the business, is like putting to a carriage with two stout horses a third, which will draw one way while the others draw another.

As to me it has always been very clear that the state of our organs and our senses has a great influence on our metaphysics and our morality, and that those ideas which seem purely intellectual are closely dependent on the conformation of our bodies, I put some questions to the blind man about the virtues and vices. The first thing I remarked was his extreme abhorrence of theft; possibly from two reasons—firstly, the facility with

for a blind man it is more difficult to learn how to speak.

Diderot
recognizes that the
senses of the
body have an influence
on philosophy
& morality.

which people could steal from him unobserved, and secondly (and still more perhaps), because he could be immediately seen were he to go about filching. Not that he is at any loss to secure himself against that sense which he knows we have above him, or that he is clumsy at hiding what he might steal. Modesty he makes no great account of. If it were not for the weather, against which clothes are a protection, he would hardly understand their use; and he openly admits he cannot see why one part of the body should be hidden rather than another; and still less by what caprice some of those parts should be especially singled out, which from their use and the indispositions to which they are subject ought rather to be kept free. Though living in an age when philosophy has rid us of a great number of prejudices, I do not think we shall ever arrive at such complete insensibility to the prerogatives of modesty as this blind man. Diogenes would have been no philosopher in his account.

As of all the external signs which raise our pity and ideas of pain the blind are affected only by cries. I have in general no high thought of their humanity. What difference is there to a blind man between a man making water and one bleeding in silence? Do not we ourselves cease to be compassionate when distance or the smallness of the objects produces on us the same effect as deprivation of sight upon the blind? So much do our virtues depend on the sensations we receive, and the degree by which we are affected by external things. I don't doubt that if it were not

6

One virtue depends upon the sensations we receive.

*Do not doubt
compassion to the
blind.*

for the fear of punishment, many people would find it less disagreeable to kill a man at a distance at which he would appear no bigger than a swallow, than to cut an ox's throat with their own hands. We pity a horse in pain, and we make nothing of crushing an ant; and is it not by the same principle that we are moved? Ah, madam, how different is the morality of the blind from ours? How different would that of a deaf man likewise be from his? And to one with a sense more than we have, how deficient would our morality appear—to say nothing more? Our metaphysics and theirs agree no better. How many of their principles are mere absurdities to us, and *vice versa*? Concerning this I might enter into details, which I am pretty certain would amuse you, but which certain people, who make a crime of everything, would not fail to exclaim against as profanity and infidelity, as if it were in my power to make the blind perceive things otherwise than they do. I will content myself with one observation, which everyone must allow, and that is, that the great argument for the wonders of nature falls flat upon the blind. The facility with which we create (if I may say so) new objects by means of a little glass, is something more incomprehensible to them than the stars which they have been condemned never to see. This luminous globe which moves from east to west surprises them less than a small fire which they can increase or diminish at will; and as they see matter in a more abstract manner than we do, they are less indisposed to believe that it thinks.

the metaphysics of the blind is derived from the sight of the stars.

H.G. Wells' s
short-stories

If a man who had had sight only for a day or two found himself in the midst of a blind people, he would either have to hold his peace or be considered a brain-sick fool. Every day he would come out with some new wonder, which would only be such to them, and which their free-thinkers would oppose tooth and nail. Might not the apologists of religion greatly avail themselves of such a stubborn unbelief, which, however just in some respects, is yet so very ill-founded? Be pleased to dwell only a little upon this supposition; it will remind you of the persecutions undergone by those poor wretches who discovered truth in the dark ages and were rash enough to reveal it to their blind contemporaries, and found their bitterest enemies were those who from their circumstances and education would have seemed most likely to receive it willingly.

So much for the morals and metaphysics of the blind. I now pass on to less important matters, which have nevertheless lately been the chief subject of observation with regard to the blind ever since the Prussian oculist's arrival. First question: How can a man born blind form ideas of figures? By the movements of his own body and by stretching his hand in various directions, by passing his fingers continuously over an object, he gets an idea of space. If he passes his fingers along a taut thread, he obtains the idea of a straight line; if he follows the curve of a slack thread, that of a curve. In a more general sense, by repeated usage of the sense of

touch, he has a memory of sensations experienced at different points ; and he is capable of combining these sensations or points and forming figures. A straight line for a blind man who is not a geometri-
cian is but the memory of a series of sensations of touch upon a taut thread ; a curve, the memory of a series of tactile sensations referred to the surface of some concave or convex solid. In the case of a geometri-
cian, study corrects the idea of these lines by their properties which he discovers. But whether geometri-
cian or no, the man born blind refers every-
thing to his fingers' ends. We combine coloured points, he only palpable points, or, to speak more precisely, only such tactile sensations as he remembers. He does not go through a mental process analogous to ours ; he does not create an image, for to do this it is necessary to colour a background and mark upon it points of a different colour from that background. Make these points of the same colour as the ground, and they are at once lost in it, and the figure disappears ; at any rate, that is the case in my imagination, and I suppose all imaginations are alike. When I propose to perceive in my head a straight line otherwise than by its properties, I begin by spreading in it a white cloth, against which I set out a series of black points in the like direction. The stronger the colour of the ground and points, the clearer my perception of the points. To view in my imagination a figure of a colour resembling that of the ground, puts me to no less trouble than if out of myself and on a canvas. You see then,

madam, that laws might be given for imagining with ease various objects variously coloured, but such laws are by no means calculated for one born blind. Such a man who cannot colour (and consequently cannot figure as we understand it) only remembers such sensation as one derives from touch, which he refers to different points, places and distances, and of which he composes figures. I believe that we who see never imagine any shape without colouring it, and that if we are given little balls in the dark, whose substance and colour are unknown to us, we shall immediately think of them as black or white, or some other colour; and that if we did not, we, like the blind man, should have the remembrance only of little sensations excited at our fingers' ends, and such as little round bodies may occasion. If this remembrance be very fleeting with us, if we have very little idea how one born blind fixes, recalls and combines the sensations of touch, it is owing to the custom we derive from our eyes of realising everything in our imagination by means of colours. It has happened, however, that during the agitations of a violent passion I felt a thrill run through my whole hand, and I felt the impression of the bodies I had touched some time ago revived as vividly as if they had been still present to my touch, and I realised very distinctly that the limits of sensation exactly coincided with those of these absent bodies. Although sensation by itself is indivisible, it occupies, if one may use the word, an extension in space to which the blind man is

People who see think of shapes by colours.

able to add and subtract mentally by enlarging or diminishing the parts affected. By this means he compares points, surfaces, and solids ; and he could imagine a solid as large as this terrestrial globe, if he were to imagine his fingers' ends as large as this globe, and occupied by sensation in its length, breadth, and depth. I know of nothing which is a better proof of the reality of this internal sense than this faculty, weak in us, but strong in those born blind, of feeling or recalling the sensation of bodies when they are absent and no longer acting on us. We cannot make a blind man understand how imagination represents absent objects as present to us, but we can easily recognise in ourselves the faculty that the blind possess of feeling at one's fingers' ends an absent body. To do this, press the forefinger and thumb together, shut your eyes ; separate your fingers, and immediately after this separation examine yourself and tell me if the sensation does not linger after the pressure has ceased ; if, while the pressure lasted, your mind appears to be in your head rather than at the ends of your fingers, and if this pressure does not convey the nature of a surface by the space which the sensation occupies? We only distinguish the presence of external things from their picture in our imagination by the strength or weakness of the impression ; and similarly, the blind only distinguish the sensation from the actual presence of an object at their fingers' ends, by the strength or weakness of that sensation.

but this
feeling an
absent body
at the end
of the finger
- also
imagination!

If ever a philosopher, blind and deaf from his birth, were to construct a man after the fashion of Descartes, I can assure you, madam, that he would put the seat of the soul at the fingers' ends, for thence the greater part of the sensations and all his knowledge are derived. Who is to inform him that his head is the seat of his thoughts? If the labours of the imagination tire our brain, this is because the effort we make to imagine is somewhat similar to that to perceive very near or very small objects. But this would not be the case with a man blind and deaf from his birth, for the sensations which he has gathered from touch will be the world, so to speak, of all his ideas, and I should not be surprised if, after a profound meditation, his fingers were as wearied as our heads. I am not afraid that a philosopher might object to such an one that the nerves cause our sensations and that they all start from the brain. Were these two propositions fully demonstrated, which is very far from being the case, especially the former, an exposition of all the dreams of naturalists on this head would be sufficient to confirm him in his opinion.

But if the imagination of the blind man be no more than the faculty of calling to mind and combining sensations of palpable points; and of a sighted man, the faculty of combining and calling to mind visible or coloured points, the person born blind consequently perceives things in a much more abstract manner than we; and in questions purely speculative, he is perhaps less liable to be deceived.

the blind perceive things more abstractly and are therefore less liable to be deceived

For abstraction consists in separating in thought the perceptible qualities of a body, either from one another, or from the body itself in which they are inherent; and error arises where this separation is done in a wrong way or at a wrong time—in a wrong way in metaphysical questions, or at a wrong time in applied mathematics. There is perhaps one certain method of falling into error in metaphysics, and that is, not sufficiently to simplify the subject under investigation; and an infallible secret for obtaining incorrect results in applied mathematics is to suppose objects less compounded than they usually are.

There is one kind of abstraction of which so few are capable that it seems reserved for purely intellectual beings, and that is that by which everything would be reduced to numerical units. We must admit that the results of this geometry would be very exact, and its formulas very comprehensive, for there are no objects, either possible or actually existent, which these simple units could not represent, by points, lines, surfaces, solids, thoughts, ideas, sensations, etc.; and if this should prove to be the foundation of Pythagoras's doctrine, he might be said to have failed in his aim, his mode of philosophising being too much above us, and too near that of the Supreme Being, who, according to the ingenious phrase of an English geometrician,¹ always geometrises in the universe.

¹[Brière gives the name of this geometrician as Rapson (*sic*). Raphson, not a very distinguished mathematician, may, among many others, have quoted this doctrine of Plato, but it is not very important if he did so. What makes the dictum important in Plato's mouth is that he had a

pure
abstraction
would reduce
everything to
numerical
units

We have symbols for the eye (alphabet) and the ear (sounds of language) but not for touch.

THE LETTER ON THE BLIND 89

But units pure and simple are too vague and general symbols for us. Our senses bring us back to symbols more suited to our comprehension and the conformation of our organs. We have arranged that these signs should be common property and serve, as it were, for the staple in the exchange of our ideas. We have made them for our eyes in the alphabet, and for our ears in articulate sounds; but we have none for the sense of touch, although there is a way of speaking to this sense and of obtaining its responses. For lack of this language, there is no communication between us and those born deaf, blind, and mute. They grow, but they remain in a condition of mental imbecility. Perhaps they would have ideas, if we were to communicate with them in a definite and uniform manner from their infancy; for instance, if we were to trace on their hands the same letters we trace on paper, and associated always the same meaning with them.

Is not this language, madam, as good as another? Is it not ready to hand, and would you dare to say that you have never been communicated with by this method? Nothing remains but to fix it, and make its grammar and dictionaries, if it is found that the expression by the common characters of writing is too slow for the sense of touch. Knowledge has three entrances by which it reaches our

theory that geometry is more fundamental and comprehensive than arithmetic. He disagreed in this respect from the Pythagoreans because he clearly realised that there were certain lengths of lines expressible geometrically but not arithmetically; cf. Brunschvicg, *Les étapes de la philosophie mathématique*, pp. 45, 47, 48.]

mind, and we keep one barricaded for want of signs. If the two others had been neglected we should now be little better than beasts. Just as a pressure is the only sign we have to the touch, so a cry would have been the only sign to the hearing. We have to lose one sense before we realise the advantage of symbols given to the remainder, and people who have the misfortune to be born deaf, blind, and mute, or who have lost these three senses by some accident, would be delighted if there existed a clear and precise language of touch.

It is much easier to use symbols already invented than to invent them, as one is obliged to do when there are none current. What an advantage it would have been for Saunderson to find an arithmetic arranged with signs for the touch all ready to hand at the age of five, instead of having to invent it at twenty-five! This Saunderson, madam, is another blind man whose story you will be interested to hear. Wonderful stories, indeed, are told of him, and yet there is not one to which, from his attainments in literature and his skill in mathematics, we may not safely give credit. He used the same machine for algebraical calculations and for the description of rectilinear figures.¹ You would be interested in an account of this if intelligible, and you will see my description assumes no more knowledge on your part than you actually possess, and that it would be very useful to you if you should ever want to make long calculations by touch.

¹ See note I, p. 219.

Imagine a square such as you see in figures 2 and 3, divided into four equal parts by lines perpendicular to the sides, in such a way that it gives nine points, 1, 2, 3, 4, 5, 6, 7, 8, 9. Suppose this square perforated with nine holes to hold pins of two kinds, both of the same length and thickness, but one kind with a head larger than that of the other.

The large-headed pins are only placed in the centre of the square, the small-headed pins only on the sides, except in the single case of zero. Zero is marked by a large-headed pin placed in the centre of the small square which has no pin set on the sides. The figure 1 is represented by a small-headed pin, placed in the centre of the square, which has no pin set on its sides. The figure 2, by a large-headed pin placed in the centre of the square, and by a small-headed pin placed in one of the sides at the point 1. The figure 3, by a large-headed pin placed in the centre of the square, and by a small-headed pin placed in one of its sides at the point 2. The figure 4, by a large-headed pin placed in the centre of the square, and by a small-headed pin placed in one of the sides at the point 3. The figure 5, by a large-headed pin placed in the centre of the square, and by a small-headed pin placed in one of the sides at the point 4. The figure 6, by a large-headed pin placed in the centre of the square, and by a small-headed pin placed in one of its sides at the point 5. The figure 7, by a large-headed pin placed in the centre of the square, and by a small-headed pin placed in one of the sides at the point 6. The figure 8, by a large-

headed pin placed in the centre of the square, and by a small-headed pin placed in one of the sides at the point 7. The figure 9, by a large-headed

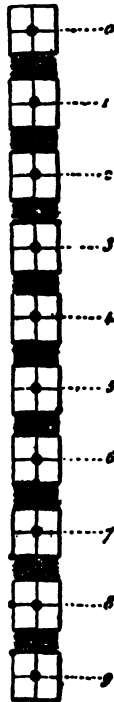


FIG. 3.

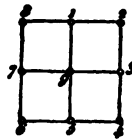


FIG. 2.

pin placed in the centre of the square, and by a small-headed pin placed in one of the sides at the point 8.

This gives ten different symbols for the sense of touch, each of which corresponds to one of our ten

arithmetical characters. Now imagine a board as large as you choose, divided into small squares arranged horizontally and separated by a small space one from the other, as you see in fig. 4, and you have Saunderson's instrument.

You can easily see that there is no number which cannot be expressed in the tablet, and hence no arithmetical process which cannot be carried out therein.

Suppose, for example, that we want to find the sum of, or to add, the nine following numbers :—

1	2	3	4	5
2	3	4	5	6
3	4	5	6	7
4	5	6	7	8
5	6	7	8	9
6	7	8	9	0
7	8	9	0	1
8	9	0	1	2
9	0	1	2	3

I write them on the table in the order they are named: the first figure on the left of the first number, on the first square to the left of the first line; the second figure on the left of the first number, on the second square on the left of the same line, and so on.

I place the second number in the second row of squares; units are units, tens are tens, etc.

I place the third number in the third row of squares,

and so on, as you see in fig. 4. Next, touching with my fingers each vertical row from the top to the bottom, beginning with that which is most to

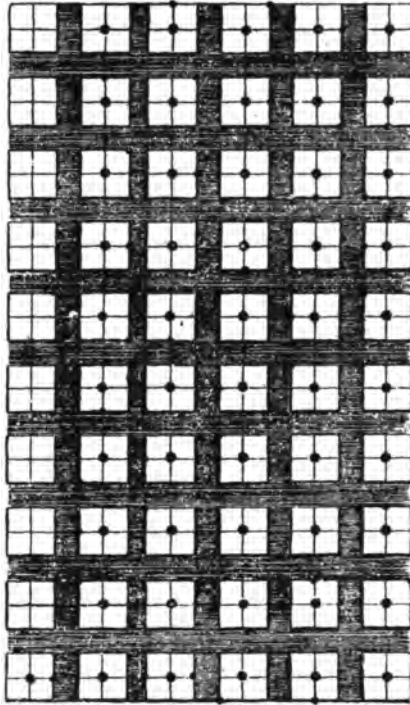


FIG. 4.

my left, I add together the numbers therein expressed; and I write the tens that are over at the end of that column. I pass to the second column, moving leftward, and work in this way; thence to the third, and so on completing my addition.

This is how the same tablet served him to prove the properties of rectilinear figures. Supposing he had to prove that parallelograms which have the

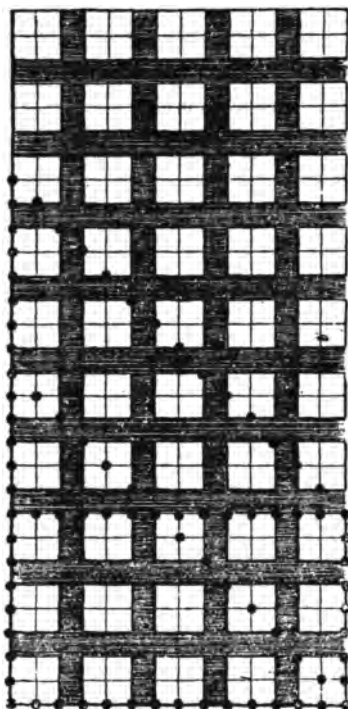


FIG. 5.

same base and same height are equal in area, he placed his pins as you see in fig. 5 ; he added names to the angles, and proceeded with the proof with his fingers.

Supposing that Saunderson only used large-

headed pins to mark the limits of his fingers, he could arrange round these small-headed pins of nine different varieties with all of which he was familiar. Thus he was never at a loss, except in cases where the great number of angular points which he was obliged to name in his proof forced him to have recourse to the letters of the alphabet. We are not told how he used them.

We only know that his fingers moved over his tablet with astonishing rapidity; that he made the longest calculations successfully; that he could interrupt them, and recognise when he was in error; that he could verify them with ease; and that this work did not take him as much time as one might imagine, because he could arrange his tablet to suit his convenience.

This arrangement consisted in placing large-headed pins in the centre of all the squares. This done, he had only to fix their value by small-headed pins, except in the case when he wished to express an unit. In that case he put a small-headed pin in the centre of the square, in place of the large-headed pin.

Sometimes, instead of forming a complete line with pins, he only placed them at all the angles or points of intersection, and round these he stretched silk threads which completed his figures. (See fig. 6.)

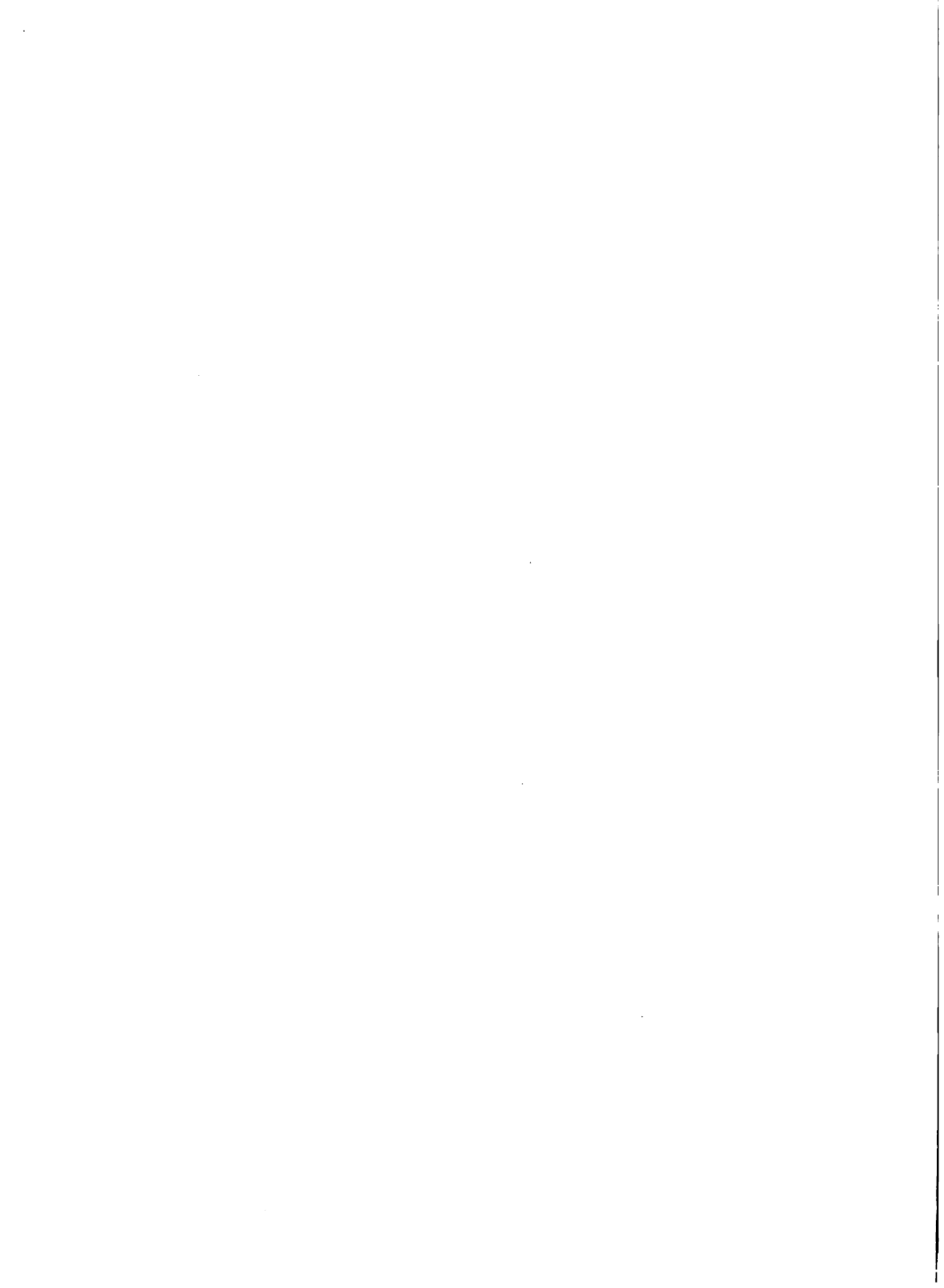
He left several other instruments which facilitated his geometrical studies; the use he made of these is not known, and more acumen would perhaps be



NICHOLAS SAUNDERSON LL.D.
 Lucasian Professor of Mathematics in
 the University of Cambridge.
 Died 19. Apr. 1739.



From the Original painted for the University of Cambridge.



required to discover this than to solve some problem in integral calculus. Let some geometrician try to discover the function of four pieces of solid wood



FIG. 6.

in the form of rectangular parallelepipeds, each 11 inches by $5\frac{1}{2}$ wide and a little more than half an inch thick, and whose two larger opposite surfaces were divided into small squares similar to the abacus I have just described; but with this differ-

ence, that they were only perforated at certain points, in which pins were driven in up to their head. Each surface had nine small arithmetical

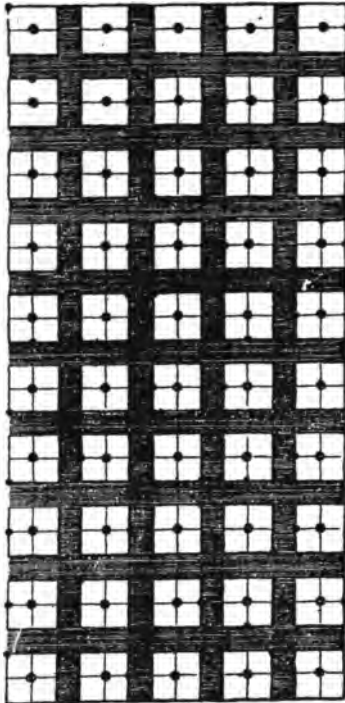


FIG. 7.

tablets, each with ten numbers, and each of these ten numbers was composed of ten figures. Fig. 7 represents one of the small tablets, and here are the numbers it contained :—

9	4	0	8	4
2	4	1	8	6
4	1	7	9	2
5	4	2	8	4
6	3	9	6	8
7	1	8	8	0
7	8	5	6	8
8	4	3	5	8
8	9	4	6	4
9	4	0	3	0

He was the author of an excellent work of its kind—*The Elements of Algebra*¹—where the only signs of his blindness are the peculiarity of certain demonstrations which a sighted man would probably not have thought of. To him we owe the division of the cube into six equal pyramids whose apex is at the centre of the cube and the base of each is one of its faces. This is used by him as a simple proof that every pyramid is the third of a prism having the same height and the same base. His taste for mathematics, his small means, and the advice of his friends decided him to give public lectures. His marvellous facility for clear demonstration encouraged his friends to think he would prove a successful teacher, for he taught his pupils as if they could not see, and a blind man who makes

¹ Printed in London, a year after Saunderson's death, at the expense of Cambridge University. In 1756 de Joncourt translated it, with some additional remarks (Amsterdam, 2 vols.).—(Br)

himself clear to the blind must be doubly lucid to the sighted ; it is a telescope the more.

His biographers say that his talk abounded in happy expressions, and I can well believe it. But "What do you mean by happy expressions?" you will perhaps inquire. I answer, madam, it is using expressions to one sense (touch, for example) which are also metaphorical to another sense (say, sight): as a result, a double light is shed on the subject for the hearer, the direct light of the natural use of the expression and the reflected light of the metaphor. It is evident that in these cases, Saunderson, with all his intelligence, was not aware of the full force of the terms he employed, since he only realised half of the ideas attached to these terms. But does not this happen to all of us at times? It may happen to idiots, who sometimes make excellent jokes, and clever folk who say a foolish thing, without either being aware of it. I have observed the want of words produces the like effect in foreigners, who in an unfamiliar language are obliged to say everything in very few words, some of which they unknowingly use very happily. But every language being to writers of a lively imagination deficient in fit words, they are in the same case as clever foreigners: the situations invented by them, the delicate gradations they perceive in characters, the natural scenes they draw, are continually leading them away from ordinary locutions and causing them to adopt turns of phrases which never fail to charm when they are neither

precious nor obscure. These are faults which are more or less readily forgiven, according to the reader's wit and knowledge of the language. This is why M. de M——¹ is the French author who most pleases the English, and Tacitus, of all the classics, bears the bell among the thinkers; they do not attend to the licences of the style, it is only the truth of the expression which strikes them.

Saunderson was extremely successful as professor of mathematics at the University of Cambridge. He gave lessons in optics, he lectured on the nature of light and colours, he explained the theory of vision; he wrote on the properties of lenses, the phenomena of the rainbow, and many other subjects connected with sight and its organ.

These facts lose much of their marvellous character when you consider that there are three distinct elements in a question in which both physics and geometry enter—the phenomenon to be explained, the hypotheses of the geometrician, and the resultant calculation. Now it is manifest that, however great the penetration of the blind man, the phenomena of light and colour are unknown to him. The hypotheses he will understand, as all of them relate to palpable causes; but the geometrician's reason for preferring them to others will be out of his ken, as in order to see that he must be able to compare the hypotheses

¹ Naigeon, and after him the editor of 1818, have inserted, instead of the initials *M. de M* . . . in the original edition, *M. de Montesquieu*. This is a great mistake; Diderot himself has given *M. de Marivaux* in the index of the 1749 and 1751 editions. The *Esprit des Loix* appeared in 1748, which might have caused this error on the part of the editors, who had not consulted the index.—(Br)

themselves with the phenomena. Therefore the blind man takes the hypotheses for what they are given him, a ray of light for a fine and elastic thread, or for a succession of minute bodies striking our eyes with incredible velocity, and he makes his calculations accordingly. The transition is made from physics to geometry, and the question becomes purely mathematical.

But what are we to think of the results of the calculation? Firstly, that it is sometimes extremely difficult to obtain them, and that it would be to little purpose that a man of science could form the most plausible hypotheses, were he not able to verify them by geometry; accordingly the greatest physicists, Galileo, Descartes, and Newton, were great geometers. Secondly, the results are more or less certain, as the preliminary hypotheses are more or less complex. When the calculation is based on a simple hypothesis, the conclusions have the validity of geometrical proofs. When there are a great many suppositions, the probability of each hypothesis being true diminishes in the ratio of the number of these hypotheses; but on the other hand increases owing to the improbability that so many false hypotheses could be mutually corrective and produce a result confirmed by the phenomena. A parallel to this would be an addition, of which the sum was correct although the sum of groups of numbers had been wrongly added up. We must admit that such a result is possible, but at the same time you see that it would very seldom prove so.

The greater the number of numbers to be added, the greater the probability of error in the addition of each, but at the same time this probability is lessened if the result of the operation be right. There are therefore a number of hypotheses, the certainty resulting from which would be the least possible. If I make A plus B plus C equal to 50, must I conclude from 50 being the real quantity of the phenomena that the suppositions represented by the letters A , B , C are true? Not at all, for there are numberless ways of subtracting from one of these letters and adding to the others which would always give 50 as the result. But the case of three combined hypotheses is perhaps one of the most disfavoured.

One advantage of calculation which I must not omit is, that the contrariety found between the result and the phenomenon excludes false hypotheses. If a man of science proposes to find the curve formed by a ray of light in passing through the atmosphere, he must regulate himself by the density of the strata of air, the law of refraction, the nature and form of the luminous corpuscles, and perhaps other essential factors which he does not include in his calculation, either because he does not know them or because he deliberately leaves them out of consideration. He then determines the curvature of the ray. If the actual curve differs from that of his calculation, his hypotheses are incomplete or false. If the actual curvature agrees with that of his calculation, there are two alterna-

tives: first that his hypotheses were mutually corrective, secondly that they were correct. But which is true? He does not know, and yet that is the certitude to which he can attain.

I read Saunderson's *Elements of Algebra* carefully in hopes of meeting what I was desirous of knowing from those who knew him intimately, and who have related some particulars of his life; but my curiosity was baffled, and it occurred to me that elements of geometry from him would have been a work both more singular in itself and of greater use to us. We should have found in it definitions of point, line, surface, solid, angle, intersections of lines, and planes, in which I make no question but he would have proceeded on principles of very abstract metaphysics, closely allied to that of the idealists. Those philosophers, madam, are termed idealists who, conscious only of their own existence and of a succession of external sensations, do not admit anything else; an extravagant system which should to my thinking have been the offspring of blindness itself; and yet, to the disgrace of the human mind and philosophy, it is the most difficult to combat, though the most absurd. It is set forth with equal candour and lucidity by Doctor Berkeley, Bishop of Cloyne, in three dialogues.¹ It were to be wished that the author of the *Essay on the Origin of Human Knowledge*² would take this work into examination;

¹ *Dialogues between Hylas and Philonous* (1713), translated by the Abbé Gua de Malvin (1750).—(A)

² Condillac (1715-1780), whose *Essay on the Origin of Human Knowledge* had appeared anonymously in 1746.—(A)

Saunderson's
principles were
not to be
referred to

critique of
idealism
the system
was for
a period of
blindness

he would there find matter for useful, agreeable, and ingenious observation—for which, in a word, no person has a better talent. Idealism deserves an attack from his hand, and this hypothesis is a double incentive to him from its singularity, and much more from the difficulty of refuting it in accordance with his principles, which are the same as those of Berkeley. According to both, and according to reason, the terms essence, matter, substance, agent, etc., of themselves convey very little light to the mind. Moreover, as the author of the *Essay on the Origin of Human Knowledge* judiciously observes, whether we go up to the heavens, or down to the deeps, we never get beyond ourselves, and it is only our own thoughts that we perceive. And this is the conclusion of Berkeley's first dialogue, and the foundation of his entire system. Would you not be curious to see a trial of strength between two enemies whose weapons are so much alike? If either got the better it would be he who wielded these weapons with the greater address; the author of the *Essay on the Origin of Human Knowledge* has lately given in his *Treatise on Systems* additional proof of his adroitness and skill and shown himself a redoubtable foe to the systematics.

We have wandered far from the blind, you will say. True, madam, but you must be so good as to allow me all these digressions; I promised you a conversation, and I cannot keep my word without this indulgence.

I have read as carefully as it was in my power

what Saunderson has said on the infinite ; and I assure you he had such very just and very clear notions on the subject that in his account most of our infinitarians would have been looked on but as blind. You yourself shall be judge: though this matter be somewhat difficult, and a little beyond your mathematical knowledge, I trust to bring it within your grasp and initiate you into the logic of the infinite.

The case of this famous blind man proves that the sense of touch, when trained, can become more delicate than sight, for he distinguished genuine from counterfeit coins¹ by passing his hands over a number of these, although the counterfeits were sufficiently good imitations to deceive a clear-sighted connoisseur ; and he judged of the accuracy of a mathematical instrument by passing the tips of his fingers along its divisions. This is certainly more difficult than to judge by touch of the resemblance of a bust to the person represented, and this shows that a blind people might have sculptors and put statues to the same use as among us to perpetuate the memory of great deeds, and of persons dear to them ; and in my opinion feeling such statues would give them a keener pleasure than we have in seeing them. What a delight to a passionate lover to draw his hand over beauties which he would know again, when illusion, which would act more potently on the blind than on those who see,

¹ *Memoirs of the life and character of Dr Nicholas Saunderson in Saunderson's Algebra*, vol. i, p. xi (1740).

should come to reanimate them! But perhaps, as he would take a deeper pleasure in the memory, his grief would be the keener for the loss of the original.

Saunderson, like the blind man of Puisaux, was affected by the smallest atmospheric change, and could recognise, especially in still weather, the presence of objects not far from him. It is related of him that being present during some astronomical observations taken in a garden, the clouds which hid the face of the sun every now and then from the spectators at the same time caused such a change in the action of the rays on his face as signified to him the moments which favoured or impeded the experiments. You may, perhaps, think that some change in the eye might indicate to him the presence of light, but not of distant objects, and I would have supposed so myself, but for the fact that Saunderson had lost not only his sight but its organ.

Saunderson, then, saw by means of his skin, and this integument of his was so keenly sensitive that with a little practice he could certainly have recognised the features of a friend traced upon his hand, and would have exclaimed, as the result of successive sensations caused by the pencil: "That is so-and-so." Thus the blind have likewise a painting, in which their own skin serves as the canvas. These are no wild fancies, and I am sure if the little mouth of M— were traced on your hand, you would immediately recognise it. Yet you must allow the blind man would find this an easier task than you,

the blind feel the loss of the original in a keener way

the blind use their skin as a canvas where impressions are painted

accustomed though you are to see and admire that mouth. For two or three elements enter into your recognition: the comparison of the tracery on your hand with the picture formed on the ground of your eye; the recollection of the manner in which we are affected by things felt, and of the manner with which we are affected by things we have only seen and admired; finally, the application of these data to the question of the draughtsman, who asks you when he draws with his pencil a mouth on the skin of your hand: "Whose mouth is this which I am drawing?" Whereas the sum of the sensations aroused by a mouth laid on the blind man's hand is the same as the sum of the successive sensations caused by the draughtsman's pencil.

I might add to this account of Saunderson and the blind man of Puisaux, Didymus of Alexandria, Eusebius the Asiatic, and Nicaise of Mechlin,¹ and some other people who, though lacking one sense, seemed so far above the level of the rest of mankind that the poets might without exaggeration have feigned the jealous gods to have deprived them of it, from fear, lest mortals should equal them. For what was Tiresias, who had penetrated the secrets of the gods, but a blind philosopher whose memory has been handed down to us by fable? But let us return to Saunderson and follow the history of this extraordinary man to his grave.

When he was at the point of death,² a clergyman of great ability, Mr Gervase Holmes, was summoned

¹ See note 2, pp. 219, 220. ² See Introduction, pp. 10-15, 18, 19.

to his side, and they held a discussion upon the existence of God, some fragments of which are extant, and which I will translate to the best of my ability, for they are well worth it. The clergyman began by haranguing on the wonders of nature. "Ah, sir," replied the blind philosopher, "don't talk to me of this magnificent spectacle, which it has never been my lot to enjoy. I have been condemned to spend my life in darkness, and you cite wonders quite out of my understanding, and which are only evidence for you and for those who see as you do. If you want to make me believe in God you must make me touch Him." "Sir," returned the clergyman, very appositely, "touch yourself, and you will recognise the Deity in the admirable mechanism of your organs."

"Mr Holmes," replied Saunderson, "I must repeat it, all that does not appear so admirable to me as to you. But even if the animal mechanism were as perfect as you maintain, and I dare say it is (for you are a worthy man and would scorn to impose on me), what relation is there between such mechanism and a supremely intelligent Being? If it fills you with astonishment, that is perhaps because you are accustomed to treat as miraculous everything which strikes you as beyond your own powers. I have been myself so often an object of admiration to you, that I have not a very high idea of your idea of the miraculous. I have had visits from people from all parts of England who could not conceive how I could work at geometry :

you must allow such folk not to have been very exact in their notions of the possibility of things. We think a certain phenomenon beyond human power and we cry out at once: 'Tis the handiwork of a god'; our vanity will stick at nothing less. Why can we not season our talk with a little less pride and a little more philosophy? If nature offers us a knotty problem, let us leave it for what it is, without calling in to cut it the hand of a being who immediately becomes a fresh knot and harder to untie than the first. Ask an Indian how the earth hangs suspended in mid-air, and he will tell you that it is carried on the back of an elephant; and what carries the elephant? A tortoise. And the tortoise? You pity the Indian, and one might say to yourself as to him: 'My good friend Mr Holmes, confess your ignorance, and drop the elephant and the tortoise.'"¹

Saunderson paused, apparently waiting for a reply, but what possible reply was there to the blind man? Mr Holmes availed himself of his good opinion of his probity and of the abilities of Newton, Leibniz, Clarke, and some of his fellow-countrymen, men of the highest genius, who had all been impressed by the wonders of nature and recognised an intelligent being as its creator. This was certainly the clergyman's strongest argument. The blind man admitted that it would be presumptuous to deny what such a man as Newton had acquiesced in; yet he represented to the clergyman that Newton's

¹ See note 3, pp. 221, 222.

evidence was not of that weight to him, as that of all nature to Newton; while Newton believed on God's word, he was reduced to believe on Newton's word.

"Consider, Mr Holmes," he added, "what a confidence I must have in your word and in Newton's. Though I see nothing, I admit there is in everything an admirable design and order. I hope you will not demand more. I take your word for the present state of the universe, and in return keep the liberty of thinking as I please on its ancient and primitive state, with relation to which you are as blind as myself. Here you will have no witnesses to confront me with, and your eyes are quite useless. Think, if you choose, that the design which strikes you so powerfully has always subsisted, but allow me my own contrary opinion, and allow me to believe that if we went back to the origin of things and scenes and perceived matter in motion and the evolution from chaos, we should meet with a number of shapeless creatures, instead of a few creatures highly organised. I make no criticism on the present state of things, but I can ask you some questions as to the past. For instance, I may ask you and Leibniz and Clarke and Newton, who told you that in the first instances of the formation of animals some were not headless and others footless? I might affirm that such an one had no stomach, another no intestines, that some which seemed to deserve a long duration from their possession of a stomach, palate, and teeth came to an end owing

to some defect in the heart or lungs ; that monsters mutually destroyed one another ; that all the defective combinations of matter disappeared, and that those only survived whose mechanism was not defective in any important particular and who were able to support and perpetuate themselves.¹

the blind man says that "Suppose the first man had his larynx closed, or had lacked suitable food, or had been defective in the organs of generation, or had failed to find a mate, or had propagated in another species, what then, Mr Holmes, would have been the fate of the human race? It would have been still merged in the general depuration of the universe, and that proud being who calls himself man, dissolved and dispersed among the molecules of matter, would have remained perhaps for ever hidden among the number of mere possibilities. If shapeless creatures had never existed, you would not fail to assert that none will ever appear, and that I am throwing myself headlong into chimerical fancies, but the order is not even now so perfect as to exclude the occasional appearance of monstrosities." Then, turning towards the clergyman, he added, "Look at me, Mr Holmes. I have no eyes. What have we done, you and I, to God, that one of us has this organ while the other has not?"

Saunderson uttered these words in such a sincere and heartfelt tone that the clergyman and the rest of the company could not remain insensible to his

¹ This is the thesis of Lucretius, and the theory of the survival of the fittest.—(A)

suffering, and began to weep bitterly. He noticed it and said to the clergyman, "Mr Holmes, I was aware of the kindness of your heart, and I am very grateful for the expression of it you have given me just now; but if you love me, do not grudge me my dying consolation of never having caused anyone affliction."

Then, continuing the conversation in a firmer tone, he added: "I conjecture, then, that in the beginning, when matter in a state of ferment brought this world into being, creatures like myself were of very common occurrence. But might not worlds too be in the same case? How many faulty and incomplete worlds have been dispersed and perhaps form again, and are dispersed at every instant in remote regions of space which I cannot touch nor you behold, but where motion continues and will continue to combine masses of matter, until they have found some arrangement in which they may finally persevere? O philosophers, travel with me to the confines of this universe, beyond the point where I feel and you behold organised beings; cast your eyes over this new ocean, and search in its aimless and lawless agitations for vestiges of that intelligent Being whose wisdom fills you with such wonder and admiration here!

"But what is the use of taking you out of your element? What is this world, Mr Holmes, but a complex, subject to cycles of change, all of which show a continual tendency to destruction; a rapid succession of beings that appear one by one, flourish

and disappear; a merely transitory symmetry and momentary appearance of order? A moment ago I reproached you for estimating the perfection of things by your own capacity; I might accuse you here of measuring duration by your own existence. You judge of the phases of the world's existence as the ephemeral insect of yours. The world seems to you eternal, just as you seem eternal to the creatures of a day; and the insect is more reasonable than you. What a prodigious series of ephemeral generations witness to *your* eternity, what an immense tradition! Yet we shall all pass away without a possibility of denoting the real extent which we took up, or the precise time of our duration. Time, matter, and space are perhaps but a point."

During this conversation Saunderson became more excited than his state of health would permit, and an attack of delirium ensued, which lasted several hours. At its close he cried, "O thou God of Clarke and Newton, have mercy on me!" and expired.

Such was the end of Saunderson. You see, madam, that all the arguments of the clergyman he took exception to were not of a character to convince a blind man. What a disgrace to men who have no better argument than he; men who have eyes, to whom the marvellous spectacle of nature from sunrise to the setting of the smallest stars reveals the existence and glory of its Maker! They have sight, which Saunderson was deprived of, but Saunderson was blessed with a purity of life and

Biderot pit. these men for the spectacle of nature points to the existence of God

uprightness which we look for in vain in them. Accordingly they lead the life of the blind, and Saunderson died as if he knew the light. The voice of nature made itself clear to him by the media of the senses he possessed, and his evidence is the more convincing against those who obstinately shut their eyes and ears. Was not the true God more completely veiled by the mists of paganism for a Socrates, than for the blind Saunderson, who never enjoyed the spectacle of nature ?

I am very sorry, madam, both for your sake and mine, that no further interesting particulars of this famous blind man have been handed down. His conversation would perhaps have afforded more light than all our experiments. Those about him must have been devoid of the philosophic spirit. I make an exception in favour of his pupil, Mr William Inchlif, who only saw Saunderson during his last moments, and who took down his last words, which I should advise all who know English to read in the original, printed in Dublin in 1747, and entitled *The Life and Character of Dr Nicholas Saunderson, late Lucasian Professor of the Mathematicks in the University of Cambridge; by his disciple and friend William Inchlif, Esq.*¹ They will find a charm, and a vigour in this, scarce ever paralleled, but which I do not flatter myself I have conveyed in translation, in spite of all my care.

¹ By rendering a Dr Inchlif responsible for his imaginary reconstruction of Saunderson's last moments Diderot alienated the sympathies of England. (A)

He married in 1713 the daughter of Mr Dickons, rector of Boxworth, in the county of Cambridge, and had by her a son and daughter who are still living. His farewell to his family was exceedingly moving. "I go," said he, "to our common destination; spare me laments which unman and unnerve. The expressions of grief which escape you only make me conscious of my own. I gladly give up a life which has been for me a long desire, a constant privation. Live on, as virtuous as I, but more fortunate, and learn to die with equal calm." He then took his wife's hand, which he held for a moment clasped in his own; he turned his face towards her as if he desired to see her; he blessed his children, embraced them, and begged them to leave him, because they caused him greater grief than the approach of death.

England is the land of philosophy and of scientific inquiry, yet without Mr Inchlif we should only know what the common man could have narrated of Saunderson; for instance, that he recognised places he had once visited by the sound the walls and pavement reflected, and many similar anecdotes, all equally common to the majority of the blind. Strange! Are blind men of such high intellectual abilities as Saunderson of common occurrence in England, and are men born blind who lecture on optics to be met with every day?

People try to give those born blind the gift of sight, but, rightly considered, science would be equally advanced by questioning a sensible blind

People want to give stout back to blind people
Diderot says that he would rather hear blind people
speak about what they already know.

THE LETTER ON THE BLIND 117

man. We should learn to understand his psychology and should compare it with ours, and perhaps we should thereby come to a solution of the difficulties which make the theory of vision and of the senses so intricate and so confused. But I own I cannot conceive what information we could expect from a man who had just undergone a painful operation upon a very delicate organ which is deranged by the smallest accident and which when sound is a very untrustworthy guide to those who have for a long time enjoyed its use. For my part, as to the theory of the senses, I would sooner hear a metaphysician who was acquainted with the principles of metaphysics, the elements of mathematics, and the conformation of the organs of sense, than an uneducated man whose sight was first due to an operation for cataract. I would have less confidence in the impressions of a person seeing for the first time than in the discoveries of a philosopher who had profoundly meditated on the subject in the dark; or, to adopt the language of the poets, who had put out his eyes in order to be the better acquainted with vision.

To obtain some certainty in such experiments the subject must at least have been prepared a long time beforehand; he should be made a philosopher—no rapid process even with a philosopher for teacher! And imagine the task if the teacher were not enlightened, or (worse still) fondly and mistakenly imagined himself enlightened! It would be better to postpone the investigation to a considerable period after the operation. To do this, the patient would

Diderot would rather believe someone who put out his eyes
in order to be the better acquainted with vision.

Difficulties of drawing philosophical knowledge from
someone who has just learned to see

118 *DIDEROT'S PHILOSOPHICAL WORKS*

Plato
↳
have to remain in darkness, and the investigator would have to see to it that his wound was healed and his eyes perfectly sound. I would not expose him to full daylight for the first time. A strong light dazzles our eyes; what effect will it not have on an organ which cannot but be extremely tender and sensitive, and which has never yet felt any impression to blunt it?

But this is only the beginning. It would be a difficult and delicate task to reap any benefit even from a person thus prepared, and to adapt our questions so that he may precisely say only what passes in himself. This interrogatory should be held in presence of the Academy; or rather, to avoid the presence of idle spectators, only such as deserve that distinction by their knowledge of philosophy, anatomy, etc., should be invited.

The task would not be beneath the intelligence of the best and wisest of men; to train and question one born blind would be an occupation worthy of the combined talents of Newton, Descartes, Locke and Leibniz.

I will end my letter, which I own is already too lengthy, by a problem which was propounded some time ago. Some reflections upon Saunderson's singular condition tend to show that it has never been absolutely solved. Suppose one blind from birth has been taught to distinguish by touch a cube and a sphere of the same metal and of approximately the same size, so that when he touches them he can say which is the cube and which is the sphere.

Suppose the cube and sphere placed on a table and the blind man suddenly to see; can he distinguish the cube from the sphere by sight without touch?

Mr Molyneux first stated this problem and attempted to solve it. He declared that the blind man would not distinguish between the cube and the sphere; "for," said he, "though he has learnt by experience the effect of a sphere and a cube upon the sense of touch, he does not yet know that what affects his sense of touch in such and such a manner must affect his sight thus or thus; nor that the projecting angle of the cube which presses against his hand should appear to his eyes as it actually does appear in the cube."

Locke,¹ when consulted on this point, said: "I certainly agree with Mr Molyneux's opinion. I believe the blind man incapable at first sight of affirming with any certainty which was the cube and which the sphere if he merely looked at them, although, if he touched them, he could name them and distinguish between them by the difference of their shape, which he would recognise by touch."

The Abbé de Condillac,² whose *Essay on the Origin of Human Knowledge* you have read with so much pleasure and profit, and whose excellent *Treatise on Systems* accompanies this letter, makes an original contribution to the question. I shall not repeat his arguments here, since you will have the pleasure of reading his book in which they are expounded in

¹ See note 4, pp. 222, 223.

² See note 5, pp. 223-5.

such an entertaining and yet such a philosophical manner that it would be a mistake on my part to tear them from their context. I shall merely observe that they all tend to prove that the born-blind either sees nothing, or distinguishes between the sphere and the cube; and that the conditions that these two bodies should be of the same metal and of approximately the same size (which was postulated in the problem) are unnecessary, which cannot be disputed; for he might have said, if there be no essential connection between the sensations of the sight and the touch (as Messrs Locke and Molyneux assert), they must admit that a body may to the eye appear to have two feet in diameter which yet would vanish on being touched. De Condillac adds, however, that if the blind man sees bodies and distinguishes their forms, and yet hesitates what to think about them, it must be from metaphysical reasons, and those not a little subtle, which I shall presently explain. We have here two different opinions on the same question—a difference between philosophers of the highest rank. One would suppose, after the problem had been studied by men such as Messrs Molyneux, Locke and the Abbé de Condillac, that nothing more could be said; but the same thing can be viewed from so many different sides that it is not strange if they have not exhausted all its possibilities.

Those who declare that a man blind from birth could not distinguish between a cube and a sphere have set out by assuming a fact which perhaps should

have been investigated ; that is, whether a blind man who has had his cataracts removed is in a condition to use his eyes immediately after the operation. They merely say : “ The blind man, comparing the ideas of spheres and cubes which he has received by the sense of touch with those received by sight, will necessarily know them to be the same ; and it would be indeed odd if he were to name that body a cube which gives the eye the idea of a sphere, and sphere that which gives the idea of a cube. He will therefore call those bodies spheres and cubes at sight which he called spheres and cubes by the sense of touch.”

But how do their antagonists reply ? They have also taken for granted that the blind man could see immediately his organ was perfect ; they supposed that an eye couched for cataract was like an arm that ceases to be paralysed. As the latter does not need exercise before it feels, they said, neither does the former before it sees ; and they added : “ Let us grant the blind man a little more philosophy than you afford him, and after carrying on the reasoning where you left it, he will continue thus : ‘ But still, who is to assure me that when I approach these bodies and touch them with my hands they will not on a sudden deceive my expectation, and that a cube will not give me the sensation of a sphere and a sphere of a cube ? Experience alone can teach me whether there be an analogy between sight and touch. The reports of these two senses may well be contradictory without my knowing it ; nay, I

should perhaps suppose what is actually present to the sight to be only a mere appearance, had I not been informed that they are the very same bodies I had touched. This object certainly seems to be the body which I called a cube ; and that, the body I called a sphere ; but the question is, not what I *think*, but what *is* ; and I am not in a position to answer the latter question satisfactorily.' ”

The line of argument, says the author of the *Essay on the Origin of Human Knowledge*, would be extremely perplexing to him who had been born blind, and I see nothing but experience which can furnish an answer to it. It seems probable that the Abbé de Condillac means only the experiment repeated by the blind man himself on a second handling of these bodies. You will soon perceive why I make this point. That able metaphysician might have added that the blind man would be the more inclined to suppose that two senses might be mutually contradictory, as he conceives that a mirror makes them mutually contradictory, as I have noticed already.

De Condillac proceeds to observe that Molyneux has confused the issues of the problem by laying down several conditions which are irrelevant to the metaphysical difficulties which the blind man would experience. This criticism is the more just, as the supposition of the blind man being acquainted with metaphysics is not at all out of the way ; because the experiment in all such philosophical questions should be accounted to be made on a philosopher—that is

to say, on a person who perceives in the questions propounded all that his reason and the state of his organs permit him to perceive. Such, briefly, are, madam, the pros and cons of the problem; and you shall now see by my examination of it how very far they, who asserted that the blind man would see geometrical figures and distinguish between them, were from realising that they were right; and what good reason their opponents had to think that they were not in the wrong.

This problem of the blind man, stated in somewhat more general terms than by Molyneux, embraces two problems which we will consider separately. We may ask (1) if the blind man would see immediately after the operation for cataract; (2) supposing he is able to see, could he see well enough to distinguish between figures; could he, in seeing them, correctly give them the same names which he gave them by the sense of touch; and if he can, prove that these names are the right ones?

Will the man born blind see immediately after the cure of the organ? Those who maintain that he will not see, say: "Directly the blind man is able to use his eyes, all the scene before him is represented at the back of the eye. This image, which is composed of a number of objects concentrated in a very small space, is but a confused mass of figures which he will not be able to distinguish. People are on the whole agreed that it is only experience which can enable him to judge of the distance of objects, and that he is obliged to approach,

touch, draw back from, and again approach and touch them to assure himself that they are not part of himself and are foreign to his essence; that he is now near and now far from them. Why should not experience be a necessary preliminary for perceiving them? Without previous experience he who perceives objects for the first time would suppose, when he is out of sight of them, that they had ceased to exist; for it is only our experience of permanent objects and such as we find again in the same place where we left them which evidences the continuity of their existence when out of our sight. It is perhaps for this reason that children are so readily consoled for toys taken from them. It cannot be said that they promptly forget them, for some children only two and a half years old know a considerable number of words of a language and are more at a loss to pronounce them than to retain them. Now, this is a proof of childhood's being the very season of memory.

Is it not a more likely hypothesis that children think that what they no longer see no longer exists, especially as their joy when things they have lost sight of appear again is mixed with surprise? Nurses help them to acquire the notion of the continuance of absent persons by playing a game which consists in hiding the face, and showing it again. Thus they learn a hundred times in a quarter of an hour that what ceases to appear does not necessarily cease to exist. Whence it follows that we owe the notion of the continuous existence

W. The notion of the continuous existence of objects is acquired.

THE LETTER ON THE BLIND 125

of objects to experience, of their distance to the sense of touch; that the eye may perhaps have to learn to see as the tongue to speak; that it would not be surprising should the aid of one of the senses be necessary to another; and that touch, which ascertains the existence of objects exterior to ourselves when present to our eyes, is likewise the sense to which the confirmation not only of their figures, and other details of these objects, but even their presence, is reserved.

To these arguments may be added the famous experiment of Cheselden.¹ The young man from whose eyes this skilful surgeon removed cataracts was for a long time unable to distinguish dimensions, distances, positions, or even figures. An object an inch in size held before his eye so as to hide a house from him appeared as large as the house itself. All he saw seemed as close to his eye as the object he touched to the skin. He could not distinguish what he judged round by touch from what he had judged angular; nor distinguish by sight whether what he had felt to be above or beneath him were in reality above or beneath him. He eventually succeeded, but not without difficulty, in perceiving that his house was larger than his room, but he could not conceive how this could be ascertained by sight. Repeated experiments were necessary before he became assured of paintings representing solid bodies; and when he was quite convinced by looking at pictures that what he saw was not bare surfaces,

¹ See note 6, p. 225.

on putting his hand to a picture he was vastly surprised at finding a plane surface without any relief. He then asked which was deceptive, the sense of touch or the sense of sight? Painting likewise has the same effect on savages. They take the painted figures for living men, question them and are astonished at receiving no answer; and this error in them certainly did not proceed from their not being accustomed to see.

But what can be answered to the other difficulties? That the trained and practised eye of a man sees better than the weak and untrained organ of an infant, or of one born blind who has had his eyes couched. Look, madam, at the proofs adduced by the Abbé de Condillac at the end of his *Essay on the Origin of Human Knowledge*, where he also adduces Cheselden's experiments as related by Voltaire. The effects of light upon an eye for the first time so affected, and the conditions required in humours of that organ, the cornea, the crystalline lens, etc., are clearly and ably specified therein, and leave little doubt that the vision of an infant opening its eyes for the first time, or a blind person who has just been operated upon, is very imperfect.

We must, therefore, admit we perceive a multitude of details in objects unperceived by the infant or one born blind, though these objects are equally represented at the back of their eyes; for objects to strike us is not enough—we must further attend to these experiences; that, consequently, we see nothing the first time we use our eyes; and during

the first moments of sight we only receive a mass of confused sensations, which are only disentangled after a time and by a process of reflection. It is by experience alone that we learn to compare our sensations with what occasions them; that sensations having no essential resemblance with their objects, it is from experience that we are to inform ourselves concerning analogies which seem to be merely positive. In short, that touch is of great service in giving the eye an accurate knowledge of the conformity of the object to the sense-impression received of it is unquestionable; and I am much inclined to think that were not everything in nature subject to laws infinitely general—if, for instance, the pricking of certain hard bodies were painful, and that of certain other bodies pleasurable—we should die before we had received the hundred-millionth fraction of the experiences necessary for the preservation of our body and our well-being.

I am not, however, of opinion that the eye is incapable of learning, or, if I may say so, of experimenting alone. To ascertain the existence and form of objects by touch, there is no necessity of seeing; why should touch be necessary for complete realisation of the same objects by sight? I am awake to all the advantages of touch; I have not disguised them in these observations on Saunderson or the blind man of Puisaux; but I cannot allow it that prerogative. It is easy to see that the use of one sense may be perfected and accelerated by the observations of another; but not that there is an

Diderot recognizes the importance of touch in the process of sight.

128 *DIDEROT'S PHILOSOPHICAL WORKS*

essential interdependence between their functions. There exist certainly properties in bodies which we should never perceive without touch ; and by touch we learn the presence of certain details invisible to the eye, which only becomes aware of these when informed by the sense of touch ; but their services are mutual ; and in the case of persons who have sight more highly developed than touch it is the former which warns the latter of the existence of objects and of details which would pass unnoticed from their minuteness. If unknown to you a piece of paper or some smooth, thin, and flexible substance were placed between your thumb and index finger, it is your eye alone which would inform you that the contact between your two fingers was not direct. It would be much more difficult, I may cursorily add, to deceive a blind man than a person used to see in this.

An eye which is in sound condition and freely exercised might have some difficulty in convincing itself that exterior objects are not part of itself; that some things are distant, some near ; that they have forms ; that some are larger than others ; that they have depth, etc. ; still, I make no doubt that at length it would come to see them, and to see them so distinctly as to distinguish at least their more obvious limits.

To deny this would be to set aside the aim and object of the organs ; it would be forgetting the chief phenomena of vision ; it would be concealing from oneself that there is no painter of such skill

as to rival the beauty and exactness of the miniatures which are painted in the back of your eyes ; that there is nothing more exact than the likeness of the representation to the object itself ; that the canvas of this picture is not so very small, that there is no confusion among the various forms, and that they occupy about a square half-inch ; and that nothing is more difficult to explain than how the sense of touch would begin to teach the eye to see were the use of the latter organ absolutely impossible without the aid of the former.

But, instead of bare presumptions, I ask you whether it is touch that teaches the eye to distinguish colours? I do not suppose such an extraordinary claim will be made for touch ; and this being so, it follows that if a blind man who has just been given the gift of sight is shown a black cube or a red sphere on a white background, he will immediately discern the several outlines of these figures.

Delay will be caused, some may object, by the time which must elapse for the humours of the eye to assume their proper dispositions, for the cornea to assume the convexity requisite for vision, for the pupil to be susceptible of the dilation and contraction proper to it, for the filaments of the retina to be sensitive in the right degree to the action of light, for the crystalline to exercise its forward and backward movement or for the muscles to fulfil their functions well, for the optic nerves to become accustomed to the transmission of sensation, for the entire eyeball to accommodate itself to all the

necessary dispositions, and for all its component parts to combine in the execution of that miniature, which so much illustrates the demonstration that the eye will bring itself to the requisite experience.

I own that, plain as the picture is which I have now represented to the eye of one born blind, he will not be able clearly to distinguish its parts until all these above conditions are combined ; but that is perhaps the work of a moment ; and it would not be difficult, by applying the aforesaid argument to a complicated mechanism such as a watch, to prove by enumerating all the movements which take place in the drum, the fusee, the wheels, the pallets, the pendulum, etc., that the hand would take a fortnight in moving the space of a second. If it is objected that these movements are simultaneous, I reply that so perhaps are the movements in the eye when it opens for the first time, and most of the consecutive judgments. Whatever are the conditions in the eye requisite for vision, it must be granted that it is not touch which imparts them to it, that the organ acquires them independently ; consequently, will succeed in distinguishing the figures represented therein without the aid of another sense.

But when does this occur?, some will say. Perhaps far sooner than is thought. When we went together to the Jardin Royal, do you remember the experiment with the concave mirror and your fright when you saw the point of a sword making at you with the same swiftness as the point

of that which you pushed towards the surface of the mirror? And yet you were sufficiently accustomed to refer objects represented in mirrors to something beyond them. Experience, therefore, is not so very necessary, nor so infallible as imagined, for perceiving objects or their images where they are. Your very parrot gives proof of it. The first time he saw himself in a mirror, he touched it with his beak, and as he did not reach himself (whom he took for a fellow-parrot) he walked round the mirror. I am not for laying more than due weight on the instance of the parrot; still, it is an experiment with an animal in which preconceived notions cannot be supposed to have any share.

Yet if I were told that a man born blind saw nothing for the space of two months, I should not be surprised. I shall only conclude from it the necessity of the organs becoming practised, not the necessity of touch. It will be another reason why it is important to let such a person remain for some time in the dark, when he is to be the subject of experiment; to allow him the opportunity of exercising his eye, which will be done more conveniently in the dark than in full daylight; and only to permit a kind of twilight during the experiments, or at least to arrange for the increasing or diminishing of light at pleasure in the spot where the experiments take place. I shall only be the more inclined to agree that such experiments will always be very difficult and uncertain; and that the best and shortest (though superficially the longest) way

would be to arm the subject with a philosophical training sufficient to enable him to compare the two conditions he has known, and to acquaint us with the difference between the state of a blind person and of one who has his sight. Once more, what precision is to be expected from one who has not the habit of thought and analysis, and who, like Cheselden's blind man, is so ignorant of the benefits of sight as to be insensible to his misfortune, not conceiving that the lack of this sense very much impairs his pleasure? Saunderson, who certainly deserves the name of philosopher, was not thus indifferent, and I doubt much whether he would have agreed with the author of the excellent *Treatise on Systems*; I suspect the latter to have fallen into a "system" himself when he writes that, "had the life of man been only an uninterrupted sensation of pleasure or of pain, happy without prospect of pain, wretched without any prospect of pleasure, he would have rejoiced or suffered; and that if he were so constituted, he would not have looked about him to discover if some influence were well disposed towards him, or desired to injure him; it is only the alternation between these two conditions which causes him to reflect," etc.

Can you believe, madam, that by a clear train of reasoning (for that is the author's method of philosophising) he would ever have been led to this conclusion? It is not with happiness and misery as with light and darkness; the one is not simply the privation of the other. We might,

perhaps, have entertained the idea that happiness was as essential to us as existence and thought, had we enjoyed it without intermission; but I cannot say the same with regard to unhappiness. It would have been very natural to look on it as a forced condition, to feel oneself innocent, yet to believe oneself guilty and to accuse or excuse nature as at present.

Does the Abbé de Condillac suppose that a child in pain only cries from his pain not having been without intermission from his birth? If he replies that "existence and pain would be one and indivisible for one who had always suffered, and that such an one could not imagine cessation of suffering without cessation of his existence," I make reply: "The man living in continual misery possibly might not have said, 'What have I done that I should suffer thus?' but why might he not have said, 'What have I done that I should be brought into being?'" At the same time, I see no reason why he should not have used his two synonymous verbs, I *exist* and I *suffer*, the one in prose, the other in poetry, as we use the two expressions, I *live* and I *breathe*. Moreover, madam, you will observe better than I do that this passage of the Abbé de Condillac's is admirably fine, and I fear you may say, after comparing my criticism with his reflections, you prefer an error of Montaigne's to a truth of Charron's.

You may blame my continual digressions. But digressions are of the essence of this treatise. Now my opinion on the two foregoing questions is this: the first time the eyes of one born blind open to the

digressions
are the
essence
of the
treatise

light, he will see nothing at all; some time will be necessary for his eye to practise sight; it will practise alone and without the aid of touch, and will eventually distinguish not only colours but the main outlines of objects. Supposing he acquired this aptitude in a very short space of time, or acquired it by using his eyes in the dark apartment in which he had been confined and urged to use that exercise for some time after the operation and before the experiments; let us now see whether he would recognise at sight the bodies he had touched, so as to give them the proper appellations. This is the final question.

In order to treat the question in the manner you will appreciate—for you like method—I will classify the persons on whom the experiment might be made. If they are dullards without education and knowledge and also unprepared, I hold that when the operation for cataract has completely removed the defect of the eye and the eye is in a healthy state, objects would be very distinctly pictured in it; but such patients, being unaccustomed to any kind of reasoning and not knowing anything of sensation or idea, would be unable to compare the sensations they had received by touch with those they now receive by sight, and would at once exclaim, “There is a round, there is a square,” so that their judgment is not to be relied on; or even they will possibly own that they saw nothing in the objects present to their sight like what they have handled.

Another class there is, who by comparing the forms they see with the bodies that had previously made an impression upon their hands, and mentally applying touch to distant objects, would describe one body as a square, and another as a circle without well knowing why, their comparison of the ideas they have acquired by sight not being sufficiently distinct in their minds to convince their judgment.

I pass to a third class of subject, a metaphysician. He, I make no doubt, would, directly he began to see objects clearly, reason as if he had seen these bodies all his life; and after comparing the ideas acquired by sight with those acquired by touch he would declare as confidently as you or I: "I am very much inclined to think that this is the body which I have always called a circle, and that again what I named a square, but will not assert it to be really so. What is to prevent their disappearance if I were to touch them? How am I to know whether the bodies I see are also meant to be touched? I do not know whether visible things are palpable; but were I assured of this, and did I take the word of those about me that what I see is really what I have touched, I should be no better off. These bodies may transform themselves in my hands and transmit on contact sensations quite different from those resulting from sight. "Gentlemen," would he conclude, "this body appears to be the square, that the circle; but that they are the same to touch as to sight is what I have no knowledge of."

Bidenet's answer to Milloux's problem depends on the subject of the experiment!

If we take as our subject a geometrician instead of a metaphysician, he will likewise say of the two figures he has before his eyes, one is what he used to call a square, the other what he used to call a circle: "For I see," he would add, "that it is only in the former I could arrange my threads and insert my large-headed pins which denoted the angles of the square; and only in the latter figure I could place the threads I required to demonstrate the properties of a circle. Here is a circle, then, and here is a square. But," he would have added with Locke, "perhaps when I lay my hands on these figures they will change one into another, so that the same figure would serve me in demonstrating the properties of a circle to the blind and the properties of a square to the sighted. I might possibly see a square and at the same time feel a circle. No," he would have continued, "I am wrong. Those to whom I demonstrated the properties of the circle and the square had not their hands on my abacus, and did not touch the threads which I had stretched to outline my figures, and yet they understood me; they therefore did not see a square when I felt a circle, otherwise we should have been at cross-purposes; I should have been outlining one figure and demonstrating the properties of another, I should have given them a straight line for the arc of a circle, and an arc for a straight line: but as they all understood me, all men see alike: what they saw as a square, I see as a square; what they saw as a circle, I see as a circle. So this is what I have

always called a square and that is what I have always called a circle." I have substituted a circle for a sphere and a square for a cube, because there is reason to think that we only judge of distances by experience; and of course he who uses his eyes for the first time sees only surfaces without knowing anything of projection, since a projection consists in certain points appearing nearer to us than others.

But even if the blind man were able in his first attempt to judge of the projection of solidity of bodies and distinguish not only a circle from a square but likewise a sphere from a cube, yet I do not therefore think that this will hold good with regard to the case of more composite bodies. There is reason to suppose that Monsieur de Réaumur's blind woman distinguished between colours, but the odds are thirty to one that what she said of the sphere and the cube was purely guesswork. I am firmly persuaded that it was not possible for her (without inspiration) to recognise her gloves, her dressing-gown, and her shoes. These objects are so composite and full of detail; there is so little resemblance between their total shape and that of the limbs they are designed to adorn or cover that Saunderson would have been infinitely more perplexed to find out the use of his mortar-board than d'Alembert or Clairaut to discover the use of his tables.

Saunderson would infallibly have supposed a geometrical relation between the object and its use, hence he would have recognised that his skull-cap was made for his head, for this had no arbitrary

form to confuse him. But what would he have thought of the points and tassel of his mortar-board? What was the use of the tassel, or why four points rather than six? And these two ornamental peculiarities would for him have been the source of a number of absurd theories, or rather an excellent satire upon what we call good taste.

Taking everything into mature consideration, it will be admitted that the difference between a person who has always seen, but to whom the use of an object is unknown, and one who knows the use of an object, but has never seen, is not to the latter's advantage. Yet, do you think, madam, if you were shown a head-dress to-day for the first time, you would ever guess it to be an ornament, and particularly intended for the head? But if it be more difficult for one born blind and seeing for the first time to form a correct idea of complex objects, what is there to prevent him taking a person dressed and sitting motionless in an arm-chair for a machine or a piece of furniture, and a tree with its leaves and branches tossed by the wind for a self-moving, animated, and thinking being? How much our senses suggest to us; and were it not for our eyes how apt should we be to suppose that a block of marble thinks and feels!

It is certain, therefore, that Saunderson would have been assured of his not being mistaken in the judgment he had just given of the circle and the square, and that there are cases when the reasoning and experience of others are of value in elucidating

the relation of sight to touch, and in teaching that what a thing is to the eye, it is likewise to touch.

It would, however, be not the less essential in demonstrating some proposition of universal application (as it is termed) to test the proof by depriving it of the evidence of the senses; for you are very well aware, madam, that if some person attempted to prove to you that two parallel lines seen in perspective are to be represented in a picture by two converging lines, because the two sides of an avenue appear to converge, it would be forgetting that the proposition is as true for one that is blind as for himself. But the foregoing supposition of one born blind suggests two others: firstly, of a man who had always seen, but was devoid of the sense of touch; secondly, of a man in whom the senses of sight and touch were mutually contradictory. We might ask the former whether, if the missing sense were given him, or sight were obscured by a bandage, he would recognise bodies by touch. It is clear that geometry (provided he were acquainted with that science) would be an infallible guide as to whether the evidence of the two senses were contradictory or no. All he would have to do would be to take the cube or sphere in his hand, and demonstrate its properties, and pronounce that what he feels a cube is a cube to the eye; hence it is a cube he holds. As to one who is ignorant of this science, I believe he would not more easily distinguish a cube from a sphere by touch than Molyneux' blind man distinguished them by sight.

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some
universal
truth, one
should
depend
on the
evidence of
the senses

In the case of a man in whom the sensations of sight and touch are in a perpetual contradiction, I do not know what he would think of shapes, order, symmetry, beauty, ugliness, etc. In all probability he would be with regard to those things as we are with regard to the real extension and real duration of beings. He would, in general, say that a body possesses a shape, but he must be inclined to think that it is neither that which he sees nor that which he feels. Such an one might be dissatisfied with his senses, but his senses would be neither satisfied nor dissatisfied with the objects. Were he inclined to charge one sense with inaccuracy, I imagine it would be touch. A hundred circumstances would incline him to think that the form of objects changes rather by the action of his hands upon them than by that of the objects on his eyes. But in consequence of these preconceived notions, the difference between hardness and softness which he would find in bodies would be very perplexing to him.

But does it follow that figures are better known to us because our senses are not self-contradictory? Who has told us that they are not false witnesses? Yet we pass judgment. Alas! madam, when we weigh our human knowledge in Montaigne's scale, we are almost reduced to adopting his motto. For what do we know? What of the nature of matter? Nothing. What of the nature of spirit and thought? Still less. What of the nature of movement, space and duration? Absolutely nothing. What of the truths of geometry? Ask any honest mathema-

ticians, and they will own to you that all their propositions are identical, and that so many volumes upon the circle (for example) are nothing but repetitions by a hundred different methods that it is a figure where all the lines drawn from the centre to the circumference are equal. Thus we scarce know anything, yet what numbers of books there are whose authors have all pretended to knowledge! I cannot think why the world is not tired of reading so much and learning nothing, unless it be for the very same reason that I have been talking to you for two hours, without being tired and without telling you anything.¹

With profound respect,

I am, madam,

Your very humble and obedient servant.¹

¹ [This translation has been collated with an eighteenth-century translation, undated and anonymous, entitled a *Letter on Blindness*.]

ADDITION TO THE PRECEDING LETTER¹

I AM going to jot down, anyhow, on paper, certain phenomena of which I was then ignorant, and which will serve as proofs or refutations of certain paragraphs in my *Letter on the Blind*. I wrote the latter thirty-three or thirty-four years ago, and I have re-read it without partiality, and am not entirely dissatisfied with it. Although the first portion seemed to me more interesting than the second, and I felt that the former could have been further extended, the latter much abbreviated, I left both as I had written them, for fear that the young man's work might suffer by the old man's retouching. I think I should find it impossible to-day to emulate all that passes muster in ideas and in expression; and I fear I am equally unable to correct what merits criticism. A famous contemporary painter spends the evening of his life in spoiling the master-pieces produced in his maturity. I know not if the defects he finds in them are real; but either he never possessed the

¹ "We have appended to the *Letter on the Blind* the sequel which Diderot composed a long time after it. . . . Those who accuse the writer of having always written hastily or of having always been hard and positive have certainly not read all his works. This sequel alone would confute them."—(*Depping*, B)

talent to improve them if he carried the imitation of nature to the extreme limits of art; or, if he possessed it, he has lost it, for all human qualities perish as a man decays. There comes a time when taste gives counsels which are recognised as just, but which we are unable to follow.

It is the weakness of spirit arising from the knowledge of weakness, or laziness which is one of the results of weakness and want of spirit, which stands in the way of a labour which would detract from the value of my work rather than improve it :

*Solve senescentem mature sanus equum, ne
peccet ad extremum ridendus, et illia ducat.*¹

Horace, *Epistolar.*, lib. i, epist. 1, v. 8, 9.

Phenomena

I. An artist who is both an enlightened student of the theory of his art, and unequalled in its practice, has assured me that it was by touch and not by sight that he judged of the soundness of kernels; and that he rolled them gently between his thumb and first finger, and so discovered by successive impressions small inequalities of surface which were invisible to his eye.

II. I have heard of a blind man who recognised by touch the colour of stuffs.

III. I could name one who arranges the colours of bouquets with the taste upon which Jean Jacques

¹ "You would be wise to turn loose the old horse in good time, lest he fail in the end, amid laughter, and strain himself."

Rousseau prided himself when, whether in jest or earnest, he confided to his friends his scheme for setting up a school to teach the flower-sellers of Paris.

IV. At Amiens there was a blind dresser who presided over numerous workmen as well as if he had the gift of sight.

V. In the case of one sighted man the use of his eyes destroyed his certainty of touch ; and in order to cut his hair, he removed the mirror and placed himself before a bare wall. The blind man who does not see a danger that threatens him is the more courageous, and I am sure he would walk with firmer step over the narrow and elastic planks bridging a precipice. There are very few who are undismayed by the sight of abysses beneath them.

VI. Everyone has heard of the famous surgeon Daviel.¹ I was often present during his operations. He removed a cataract from the eyes of a blacksmith who had contracted this disease from exposure to the fire of his forge ; and during twenty-five years of blindness he had grown so accustomed to the guidance of touch that he had to be forced to use the sense which had been restored to him. Daviel would beat him and say, "Use your eyes, you wretch!" He walked and moved, and did all that we do with our eyes open, with his eyes shut.

¹ Jacques Daviel, surgeon, born in 1696. In 1728 he made a special study of diseases of the eye, and acquired such a high reputation for skill, that in the month of November 1752 alone he performed two hundred and twenty-six operations for cataract, of which one hundred and eighty-two were successful. He died in 1762.—(A)

The eye is not necessary for happiness

We are drawn to the conclusion that the eye is not so necessary nor so essential to our happiness as we are inclined to believe. If the spectacle of nature had no charms for the blind smith Daviel operated on, what object is there to the loss of which we should be otherwise than indifferent, after long deprivation of sight accompanied by no pain? The sight of a beloved woman? I don't believe it, in spite of the story I am going to relate. We imagine that if one had passed a long time without seeing, one would never be weary of looking; but that is not the case. What a contrast between momentary and constant blindness!

VII. Poor patients seeking Daviel's help were drawn to his laboratory from all the provinces of the kingdom by his charity, and his reputation also gathered there a large body of interested and learned spectators. I believe Marmontel and I were present on the same day. The patient was seated and his cataract removed; Daviel laid his hand upon the eyes which he had just restored to the light. An old woman, standing beside him, showed the liveliest interest in the success of the operation; she shook in every limb at each movement of the operator. The latter signed to her to draw near, placed her kneeling opposite the patient, and removed his hands. The patient opened his eyes, saw, and cried: "Oh, it is my mother!" I have never heard a more piteous cry; I seem to hear it still. The old woman fainted, the spectators wept, and gave their money freely.

VIII. The most astonishing case of all those who have lost their sight almost from their infancy was Mademoiselle Mélanie de Salignac, a relative of Monsieur de la Fargue, a lieutenant-general in the army, who recently died at the age of ninety-one, covered with wounds and honours. She was the daughter of Madame de Blacy, who is still living, and who never ceases to regret a child who was the delight of her life and the admiration of all her acquaintances. Madame de Blacy is a woman of high character, who is willing to confirm the truth of my account. I write from her dictation such particulars of the life of Mademoiselle de Salignac as did not come under my personal observation during a friendship which began with her and her family in 1760, and which lasted until 1763, the year of her death.

She had a sound judgment and great sweetness of disposition and subtlety of mind, as well as naïveté and freshness. When an aunt asked her mother to help her entertain nineteen bores at dinner, she replied, "I do not understand my dear aunt: why be kind to nineteen bores? I only wish to be kind to those I love."

The sound of voices had the same attraction or antipathy for her as facial expression for those who see. A relation of hers, a receiver-general of finance, unexpectedly behaved badly to her family, and she said with astonishment: "Who would have believed it of such a charming voice?" When she heard singer she distinguished between *dark* and *fair* voices.

When people spoke to her, she judged of their height by the direction of the sound, which came to her from above if the person speaking were tall, and from below if that person was short.

She was not anxious to see, and one day I asked her the reason. "The reason," she replied, "is that then I should only have my own eyes, whereas now I have the use of everybody's; by this loss I am always an object of interest and pity, at every instant people do me kindnesses, and at every instant I am grateful. Alas! if I could see, no one would trouble about me."

The errors to which sight is liable diminished its value in her eyes. "I stand," she said, "at the entrance of a long alley; and there is a certain object at its far end. One of my friends sees it moving, another sees it stationary; one says it is an animal, another that it is a man; and on approaching it, it turns out a tree-stump. No one can tell if the tower they see in the distance is round or square. I brave a whirlwind of dust, while those about me close their eyes and become ill—sometimes for a whole day—because they had not shut their eyes soon enough. An imperceptible atom is enough to cause them cruel pain." At the approach of night she used to say that "our reign was drawing to a close, while hers was beginning." Living in the dark, and accustomed to act and think during this eternal night, insomnia, which is such a burden to us, had no terrors for her.

She would not forgive me for my statement that

the blind, to whom the symptoms of suffering are invisible, must be cruel. "Do you imagine," said she, "that you hear a cry of pain as I do?" "There are people," said I, "who suffer in silence." "I believe," she said, "that I should soon discover them and pity them all the more."

She was devoted to reading and passionately fond of music. "I think," said she, "I should never tire of hearing good singing or playing; and if this were the only pleasure in heaven, I should not be sorry to go there. You are right in maintaining that music is the most impassioned of the fine arts, not excepting poetry and oratory; that even Racine does not express himself as subtly as a harp, that his music is heavy and monotonous when compared with an instrument, and that you have often wished to give your style the strength and lightness of Bach's music. Music is the most beautiful language I know. In spoken language, the better we pronounce words, the more particularly we articulate each syllable; whereas in the language of music, sounds of the most widely different pitch from bass to treble and treble to bass follow one another imperceptibly, forming one single prolonged syllable, which varies its inflexion and expression at every moment. While this syllable is brought to my ear by the melody, the harmony carries it out, without any confusion, upon a number of instruments—two, three, four, or five perhaps—which all combine to strengthen the expression of the melody. I can understand the music without the words sung, if the

symphonist is a man of genius whose music is full of character and expression. Music is most delicious and expressive in the silence of night.

“I fancy that people who see, distracted by their eyes, cannot listen and hear as I can. Why does the praise of music I hear seem poor and faint? Why can I never speak of it as I feel? Why do I pause in the midst of what I am saying, seeking vainly for words expressive of what I feel? Are such words not invented? I know nothing comparable to the effect of music but the joy I feel when, after a long absence, I throw myself into my mother's arms; my limbs tremble, my tears flow, and my knees totter, and I feel as if I should die of joy.”

She had the most delicate feelings of modesty; and when I asked her reason, she replied: “It is the result of my mother's teaching, who has so often told me that the sight of certain parts of the body is an invitation to vice. I confess I have only understood her lately, and perhaps I had to become less innocent to do so.” She died of an internal tumour of which she never had the courage to inform anyone.

She was extremely neat and clean in her clothes and person, and this is the more remarkable as she had not eyesight to assure her that she had been successful in avoiding the vice of uncleanness and untidiness.

When her glass was being filled, she knew by the sound of the liquid as it fell, when it was full. She

fed herself with surprising dexterity. Sometimes she amused herself by standing before a mirror to dress herself, and by imitating all the affectations of a coquette. The mimicry was so true to life that we laughed aloud.

From her earliest youth efforts had been made to train her other senses, and the results were astonishing. Touch enabled her to discern minute details in shapes of objects which often pass unnoticed by those who have the best eyesight.

She had very delicate senses of hearing and smell ; she knew by the feeling of the air whether the weather was cloudy or fine, whether she was walking in a square or a road, in a road or a cul-de-sac, in an enclosed or open place, in a vast apartment or a small room. She measured the space by the sound of footsteps or the echo of voices. When she had gone over a house, its plan remained in her head, so that she would warn others of little obstacles or dangers in their way. "Take care," she would say, "the doorway here is low ; you will find a step there."

She noticed a variety in voices which we have no conception of, and when she had heard a person speak once or twice she knew him for ever.

She was very little affected by the charms of youth and by the wrinkles of age ; and said she was only charmed by the fine qualities of the heart and intellect—one of the advantages of the loss of sight, especially for women. "My head will never," she said, "be turned by a handsome face."

She had a very trusting disposition. It was so easy, and would have been so shameful, to deceive her. To lead her to imagine she was alone in a room, when this was not so, would have been the blackest of treacheries.

She was never subject to panic, and rarely to ennui ; for she had learnt in her solitude to be independent of others. She noticed that at night-fall in travelling in public vehicles people became silent. " I do not need," she said, " to see those whom I love to converse with." She set the greatest value upon sound judgment, sweetness of disposition, and gaiety. She spoke little, and was an excellent listener. " I am like the birds," she said : " I learn to sing in the dark."

When she compared what she heard from day to day, she was astonished at the contradictory nature of our opinions ; praise or blame seemed to her a matter of indifference from such inconsistent creatures as human beings.

She had been taught to read by cut-out letters. She had a pleasant voice, and sang with taste, and would have gladly spent her life at concerts or operas ; the only music she did not care for was noisy music. She danced exquisitely, and also played the viol very well, and owing to this talent she was greatly in demand among young persons of her age, to whom she taught the fashionable dances.

She was the best beloved of her brothers and sisters. " You see," she said, " what I owe to my

infirmities ; people become attached to me as a result of their kindness to me, and of my efforts to show my gratitude and deserve their good offices. Besides, my brothers and sisters are not jealous. If I had sight, my heart and intellect would be the losers. I have so many inducements to be good ! What would become of me if I were to lose the interest that I inspire ? ”

In her parents' loss of fortune, the only thing she regretted was the loss of her masters ; but they had so much liking and esteem for her that her music and mathematical masters begged her to let them teach her for nothing. She asked her mother : “ Mother, what am I to do ? They are not rich, and need all their time. ”

She had been taught music by notes in relief placed on raised lines on a large board. She read these notes with her hand, and played them on her instrument, and in a very short time she learnt to play the longest and most elaborate piece.

She knew the elements of astronomy, algebra, and geometry. Her mother, who read her Abbé de la Caille's book, would now and again ask her if she understood it. “ Quite easily, ” she would reply.

She declared that geometry was the science of the blind, because it was of such universal application and no external aid was necessary to become proficient in it. “ The geometrician, ” she added, “ spends nearly all his life with his eyes shut. ”

I have seen the maps with which she studied geography. The parallels and meridians were made

of wire ; the boundaries of kingdoms and provinces of embroidery in linen, silk, or wool of various thickness ; the rivers and streams and mountains of pins' heads of various sizes ; and cities and towns of drops of wax of various sizes.

One day I said to her, "Mademoiselle, imagine a cube."

"I see it."

"Place a point in the centre of the cube."

"I have done so."

"From the point draw straight lines to the angles ; into what have you divided the cube ?"

"Into six pyramids," she replied without hesitation, "each having as its base one side of the cube, and a height equal to half its height."

"True, but tell me where you see this ?"

"In my head, as you do."

I must admit I have never been able clearly to understand how she represented figures in her head without the aid of colour. Was her cube formed from memories of sensations of touch ? Had her brain become, as it were, a hand within which substances were realised ? Had a connection between two senses been established ? Why does this connection not exist in my case, and why do I picture nothing that is not coloured in my mind's eye ? What is the imagination of a blind man ? This phenomenon is by no means easy of explanation.

She wrote with a pen, with which she pricked a sheet of paper stretched on a frame divided by two parallel and movable slats, which only left sufficient

space between them for one line of writing. The same method of writing served to answer her, as she read the communication by passing her finger-tips over the slight roughness formed on the back of the paper by the needle or pin.

She read books printed on one side of the paper only for her use by Prault. One of her letters was printed in the *Mercur*.

She took the trouble to copy out with her needle President Hénault's *Historical Synopsis*,¹ and her mother, Madame de Blacy, gave me this curious document.

People will find it difficult to accept the following fact, though I and all her family, as well as twenty persons still alive, can vouch for it. Given a piece of poetry of twelve to fifteen lines, if she was told the first letter and the number of letters in each word, she could reconstruct the poem, however odd and far-fetched. I tried her with Collé's² *ambigouris*. She sometimes lighted on a better word than the original. She threaded the finest needle rapidly by laying the thread or silk on the index finger of her left hand and drawing this with a fine point through the eye of the needle placed perpendicularly. She could make all sorts of small articles—edgings, bags of all kinds, some of drawn work, and of various patterns and colours; garters, bracelets, necklaces made of glass beads the size of letters arranged to

¹ [*Abrégé de l'histoire de France.*]

² [Collé, Charles (1709-1783), a dramatic author who also wrote *ambigouris* or nonsense verses.]

form patterns. I am sure she would have made a good compositor, for the greater includes the less.

She played *reversis*, *médiateur*, and quadrille well. She sorted her cards herself, and recognised each by touch from minute peculiarities others could neither see nor feel. In *reversis* she had a special place for the ace (especially the ace of diamonds) and the knave of hearts. The only difference in playing with her was that the card played was named. If the knave of hearts was in danger, a smile passed over her face, which she could not restrain though she realised that it was indiscreet.

She was a fatalist, and believed that our efforts to escape our destiny only served to draw us thither. I do not know what she thought of religion; she kept her opinions to herself out of consideration for her mother, who was devout.

Lastly, I will give you her ideas upon handwriting, drawing, engraving, and painting, and they are, I think, very just, as I hope you will think after reading the following conversation between us. She begins the dialogue:

“If you trace on my hand with a point, a nose, a mouth, a man, a woman, or a tree, I should be sure to recognise them; and if the tracing was correct, I should hope to recognise the person whom you had drawn; my hand would become a sensitive mirror, but the difference in sensibility between this hand and the organ of sight is immense. I suppose the eye is a living canvas of infinite delicacy; the air strikes the object, and is reflected back from the

object to the eye, which receives a multitude of impressions varying in accordance with the nature, the form, the colour of the object, and also perhaps with the properties of the air which I do not know, and of which you are equally ignorant; and the object is represented to you by the variety of these sensations.

“If the skin of my hand was as sensitive as your eye, I should see with my hand as you see with your eyes; and I sometimes imagine there are animals who have no eyes, but can nevertheless see.”

“And the mirror?”

“If any bodies are not mirrors, it is by some defect in their composition which destroys the reflection of the air. I think this is the more likely as gold, silver, iron, and copper, when polished, are able to reflect the air, while rough water and cracked ice lose this property. Variety in sensation (and hence in the property of reflecting air), in the materials you employ, distinguishes the writing from the drawing, the drawing from the engraving, the engraving from the picture. The writing, the drawing, the engraving, and the picture in one colour are all monochromes.”

“But if there is only one colour, we should only distinguish that colour.”

“It seems that the surface of the canvas, the depth of colour, and the way in which it is used, produce in the reflection of the air a corresponding variation to that of the objects. Don't ask me any more, for that is all I know.”

“To try to teach you any more would be waste of time.”

I have not described in her case all I might have noticed if I had seen her oftener and questioned her skilfully. I give you my word of honour that all I have recorded is actual fact.

She died at the age of twenty-two. With a wonderful memory, and strength of mind as wonderful, what progress she would have made in science if she had had a longer life! Her mother read history to her, and this was a task pleasant and useful to both of them.

LETTER ON THE DEAF AND DUMB

Letter to Monsieur—

20th Jan. 1751.

I AM sending, sir, to the author of *The Fine Arts reduced to a Single Principle*, the *Letter* revised, corrected, and augmented in accordance with the advice of my friends; but always with the same title.

I grant that this title is applicable equally to the large number of those who *speak without understanding* and the small number of those who *understand without speaking*, and to the very small number of those who *speak and understand*, and for whose use my letter is solely intended.

I admit that it is an imitation of another *Letter*¹ which might be better; but I am tired of hunting for a better title. Whatever importance you attribute to the choice of a title, the title of my letter will remain unchanged.

I do not like quotations, and I like Greek quotations least of all; they give a learned air to a book, which is no longer fashionable. They frighten away readers, and if I was deciding from a publisher's

¹ *Letter on the Blind, for the Use of those who See.*—(D)

standpoint I should leave out such scarecrows. But I am not a publisher, so please suffer the Greek quotations to remain where I have placed them. If you care less for a book being good, than that it should be read, I do not agree with you ; what I care for is to make a good book, although it may risk being less read.

As to the number of subjects I touch upon moving from one to another, I would have you know, and tell others, that this is no fault in a letter where one is allowed to converse freely, and where the last word of a phrase is a sufficient link to the next.

You may therefore print me, if that is all ; but print me anonymously, if you please. I can always admit the authorship later. I know one to whom people would not attribute it, and another on whom it would be certainly fathered, if it possessed some eccentricity in its ideas, some share of imagination, style, some temerity of thought which I should be sorry to share, a fine display of mathematics, metaphysics, Italian and English ; less Latin and Greek, and more music.

See that no errors creep into the text ; a single mistake is enough to ruin all. You will find in Havercamp's fine edition of Lucretius in the last book the figure I want. Take out the child which half hides her, imagine a wound beneath the breast, and have it copied. My friend Monsieur de S. has undertaken to revise the proofs. His address is . . .

I am, etc.

LETTER ON THE DEAF AND DUMB
FOR THE USE OF THOSE WHO
HEAR AND SPEAK :

Which treats of the origin of inversions in language, of harmony of style, of sublimity of situation, and of some advantages which the French language has over most ancient and modern languages, also some thoughts on expression in the fine arts.

I HAD no intention, sir, to take credit for your researches, and you may claim what you please in this letter. If it happens that my ideas are similar to yours, I am like the ivy which mingles its foliage with the oak. I might have addressed my letter to the Abbé de Condillac, or to Monsieur du Marsais, who has also treated of inversions; but you just came to my mind, and I have made free with you, for I am persuaded that the public will not this time take a happy accident for a deliberate choice. My only fear is, that I may waste your time and snatch from you those hours which you are doubtless devoting to philosophy, and which you owe to that study.

Now, in order to treat of inversions we must first consider how languages are formed. Objects that strike the senses are those that are first noticed, and those which unite various qualities which strike the senses are named first, *i.e.* the different objects of which the world is composed. Then the various qualities are distinguished and named, and these form most of our adjectives. Afterwards, these sensible

qualities being put aside, some common quality was observed in various objects, such as impenetrability, extension, colour, shape, etc., and from these abstract and general names were formed and nearly all substantives. Gradually men became accustomed to think that all these names represented real things; and the sensible qualities were regarded as simple accidents, and thus the adjective was thought to be subordinate to the substantive, although the substantive does not really exist and the adjective is everything. If you are asked to describe an object, you answer that it is a body with a surface, impenetrable, shaped, coloured, and movable. But subtract all these adjectives from your definition and what is left of that imaginary being you call a body? If you wished to arrange the terms of your definition in their natural order, you would say a coloured, shaped, extended, impenetrable, movable substance. It seems to me that a man seeing the object for the first time would be affected by the different qualities in this order of terms. The eye would be first struck by the shape, colour, and surface; touch would then discover its impenetrability, and eye and touch together would discover its mobility. There would, therefore, be no inversion in this definition, and there is an inversion in the definition in its first form. It follows, therefore, that if we wish to maintain that there is no inversion in the French language, or at least that it is much rarer than in the learned tongues, the utmost we can say is that our constructions in French are for the most

part uniform ; that the substantive is always, or nearly always, placed before the adjective ; and the verb between them. For if we consider the question on its own merits, and ask if the adjective should be placed before or after the noun, it will appear that we frequently reverse the natural order of ideas. The example I have just given is an instance of this. I say the *natural* order of ideas ; for we should distinguish here between the natural order and the *acquired*, or what we may term the *scientific* order ; the latter is a deliberate arrangement after a language is fully formed.

As adjectives usually represent sensible qualities, they stand first in the natural order of ideas ; but to a philosopher, or rather to philosophers who are accustomed to regard abstract substantives as realities, substantives will come first in the scientific order, being, in their language, the support which upholds the adjective. . Thus of the two definitions of a body I gave, the first follows the scientific or acquired, the second the natural order.

From this we may conclude that it is perhaps owing to the peripatetic philosophy, which realised all general and abstract entities, that we have in our language hardly any of what we call inversions in the classics. Our Gallic authors had much more than we have, and this philosophy was in the ascendant while our language was being perfected under Louis XIII and Louis XIV. The Ancients, who generalised less, and who studied nature more in detail, were less monotonous in the order of their

tongue, and the word inversion would have perhaps astonished them. You will not raise as an objection here, that the peripatetic philosophy is Aristotle's philosophy, and hence the philosophy of some portion of the Ancients, for you doubtless tell your disciples that our peripatetic philosophy is very different from Aristotle's.

But it is, perhaps, unnecessary to go back as far as the creation of the world and the origin of language to explain why inversions crept into and were preserved in languages. It would be sufficient to make an imaginary journey to a people whose language one was unacquainted with; or, what comes to almost the same thing, to experiment with a man who would forgo the use of articulate sounds and try to make himself understood by gestures alone. Such a man, who would perfectly understand the questions put to him, would be an excellent subject for experiment; and from the succession of his gestures definite inferences could be drawn as to the order of ideas which seemed good to the early men in order to communicate their thoughts by gestures, and under what circumstances articulate sounds were invented.

I should give my "theoretical mute" plenty of time to compose his replies; and as to the questions, I would make a point of introducing ideas whose expression by means of gesture I should be most anxious to learn. It would be both useful and entertaining to multiply experiments upon these ideas, and to propound the same questions to a

number of persons at once. I believe that a philosopher who practised such experiments with some friends, who were intelligent men and good logicians, would not find it a total waste of time. An Aristophanes would no doubt turn it to ridicule, but what matter? One could say what Zeno said to his disciple: *εἰ φιλοσοφίας ἐπιθυμεῖς, παρασκευαζοῦ αὐτοθεν, ὡς καταγελαθσόμενος, ὡς, etc.* *If you wish to become a philosopher, expect to be ridiculed.* That is a fine maxim, sir, and one that would elevate souls less courageous than ours above human comment and all frivolous considerations.

You must not confuse the experiment I suggest with ordinary pantomime. To translate an action and a speech into gesture are two very different things. I am sure that there are inversions in the language of our mutes, that each one has his style, and that their inversions denote differences as pronounced as those we find in ancient Greek and Latin authors. But as we always most highly approve of our own style, the discussion that would ensue after these experiments would be of the most lively and philosophical nature, for all our theoretical mutes, when they had leave to use their tongues again, would be obliged to justify not only their expression, but also the way they placed such and such an idea in a certain order in their gestures.

This leads me to another idea that is a little alien to the subject of my letter, but in a letter digressions are allowed, especially when they lead to useful results. My idea would be to analyse, as it

were, a man, and to examine what he derives from each of his senses. I have sometimes amused myself with this kind of metaphysical anatomy, and I consider that of all the senses the eye was the most superficial, the ear the proudest, smell the most voluptuous, taste the profoundest and most philosophical. It would be amusing to get together a society, of which each should have only one sense; there can be no doubt that all these persons would look on one another as out of his wits, and I leave you to judge with what reason. And yet this is an example of what happens amongst us every day; we have, so to speak, only one sense, and we judge of everything. We may remark that this group of five persons, each possessing only one sense, might by their faculty of abstraction have one interest in common—that of geometry,—and might understand one another on that subject, and that alone. But to return to our theoretical mutes, and to the questions we should put them.

If these questions were such that more than one answer was possible, it would follow that one mute would give one, and another mute another; and that the comparison between their replies would become impossible or at any rate difficult. This difficulty suggested to me that a speech for translation from French to gesture-language would be better than a question for experimental purposes. The translators must be warned to avoid ellipsis, for the language of gesture is difficult enough without increasing its laconism by the use of this figure.

By the efforts of those born deaf and dumb to make themselves understood, we see they express all they are able to express. I should therefore recommend our theoretical mutes to copy them, and, as far as is possible, to form no sentence where the subject and the attribute with all their dependencies are not expressed. In short, they would only be allowed the choice of the order in which they would present ideas, or rather the gestures representing these ideas.

But there I see a difficulty. As thoughts, I know not by what contrivance, enter our mind very much in the form in which they appear in speech when they are tricked up, it is possible that this will cause some difficulty to our theoretical mutes; perhaps they would be tempted to imitate the order of the words in the spoken language they are already familiar with—a temptation which assails almost everyone who writes in a foreign language. All of our best modern Latinists fall into French constructions, so that perhaps our mutes' construction will not be the construction of a man who had never had any notion of speech. What do you say? Perhaps this difficulty would be of less frequent occurrence if our theoretical mutes were philosophers or orators; but if this obstacle arises we might have recourse to one born deaf and dumb.

You will doubtless think this a singular way of obtaining true notions of the formation of a language. But pray consider, how much less far from truth ignorance is than prejudice, and that a

man born deaf and dumb has no prejudices with regard to the manner of communicating his thoughts. Consider that inversions have not passed into his language from another, and that if he uses them it is nature alone which suggests their use ; that he is closely analogous to those beings people have imagined who with no trace of education, very few perceptions, and almost no memory, might easily pass for two-footed or four-footed animals.

I can assure you, sir, that a translation of this gesture language would do the translator great credit, for not only must he have completely understood the meaning and the thought, but the order of the words of the translation must faithfully follow the order of the gestures of the original. (To do this a philosopher would have to question his author, hear his replies, and represent them with exactness ; but philosophy is not learnt in a day.) One of these requisites would, however, facilitate the rest ; and if the question was given with a precise explanation of the gestures which are to compose the answer, it would be possible to represent gestures as far as possible by words. I say as far as possible, for there are gestures so sublime that the noblest eloquence can never translate them. Such is the scene in Shakespeare's tragedy of *Macbeth*. Lady Macbeth, walking in her sleep, advances silently with closed eyes (Act v, Scene i), and rubbing her hands together as if she were washing away the stain of the king's blood she had shed twenty years before. I know nothing in speech so

pathetic as the silence and motion of this woman's hands. What an expression of remorse!

The way in which another woman carried the tidings of his death to her husband, who was still uncertain of his fate, is another example of a gesture unapproached in its vigour by the spoken word. She went with her son in her arms to a spot in the country which her husband could see from the tower in which he was imprisoned; and, after looking for some time at the tower, she took a handful of earth which she scattered in the form of a cross on the body of her son, whom she had laid at her feet. Her husband understood the sign, and starved himself to death. The sublimest thought is forgotten, but these actions are never effaced from one's memory. I could make many reflections at this point on sublimity of situation, but they would take me too far from my subject.

Many of the fine lines in that magnificent scene in *Heraclius*, where Phocas does not know which of the two princes is his son, have been justly admired. For my part, the passage in the scene that I prefer is that where the tyrant turns to each of the princes in turn, and calls them by the name of his son, and they both remain cold and motionless:—

*“Martian, à ce mot aucun ne veut répondre.”*¹

This cannot be put upon paper, and gesture here triumphs over speech.

Epaminondas, at the battle of Mantinæa, is

¹ [“Martian! and none will answer to the word.”—Corneille, *Heraclius*, Act iv, Scene iv.]

mortally wounded; the doctors tell him he will die when the spear is drawn from his body. He asks for his shield, for it is dishonourable to lose the shield in battle; and when this is brought to him, he draws out the spear-head himself. In the sublime scene at the close of the tragedy of *Rhodogune*, the most effective moment is certainly when Antiochus lifts the bowl to his lips, and Timagène enters crying "Ah, lord!" (Act v, Scene iv). What a throng of ideas and emotions crowd upon the audience at this gesture and this cry! But I am digressing. To come back to our man born deaf and mute. I know of one who would be useful for experimental purposes, because he is intelligent and has expressive gestures, as you shall see.

I was playing chess one day, and the dumb man was watching. My opponent fought me to a difficult position, and the dumb man quite understood, and, thinking the game was lost, he closed his eyes, drooped his head, and let fall his arms—as a sign that he considered me checkmated, or done for. Consider for a moment how metaphorical is the language of gesture. At first I thought as he did; but as I had not exhausted the combinations, I was in no hurry to yield, and I looked about for a way out. The dumb man still thought there was none, and he expressed this very clearly by shaking his head and by putting back the lost pieces in the box. His example induced the other spectators to discuss the situation; they examined it, and, after some fruitless expedients had been tried, a successful one

was discovered. I made use of it, and explained to the dumb man that he was mistaken, and that I had escaped though he did not expect me to. But he, by pointing his finger at the spectators one after another, and making a motion of the lips, accompanied by a sweeping movement of his arms in the direction of the door and the tables, replied that it was no credit to me to have got out of my difficulty by calling in all and sundry to my help. His gestures were so significant that no one could misunderstand him, and the popular expression "all and sundry"¹ occurred to many at the same time: this expression was definitely translated by our dumb man's gestures.

You know, at least you have heard, of a singular machine with which the inventor proposed to give sonatas in colour. I thought that if anyone could appreciate a performance of ocular music, and could judge of it without prejudice, it would be a man born deaf and dumb. I therefore took my friend to the house in the rue St Jacques, where the operator and the machine with colours was exhibited. Ah, sir, you would never guess the kind of impression that it made on him, nor the ideas it suggested.

You see that it was impossible to explain to him beforehand the nature and marvellous powers of the harpsichord; and, having no idea of sound, this instrument with colours could not suggest to him any musical impressions. The purpose of the machine

¹ [*Consulter le tiers, le quart et les passants*; literally, "the third, the quarter, and the passers-by."]

was as incomprehensible to him as the use of our organs of speech. What, then, were his thoughts, and what was the cause of his admiration for Father Castel's coloured fans? Guess, sir, his conjectures about this ingenious machine,¹ which very few people have seen, though many have talked about it, and whose invention would do honour to many of those who ridicule it. Our deaf-and-dumb friend imagined that the inventor was also deaf and dumb, and that his harpsichord was the instrument by which he communicated with other men; he imagined also that each shade of colour represented a letter of the alphabet, and that by touching the keys rapidly he combined these letters into words and phrases, and, in fact, spoke in colours.

You may imagine he was pleased with his own perspicacity in finding this out; but our friend did not rest on his laurels; the idea suddenly came into his head that he now grasped what music and musical instruments were. He supposed that music was a peculiar manner of communicating thought, and that musical instruments—lutes, violins, and trumpets—were so many different organs of speech. You will say that only a man who had never heard music or a musical instrument could have happened on such a theory. But please consider that this theory, although obviously false to you, seemed almost proved to a deaf-and-dumb person. When the deaf-

¹ [Voltaire ridiculed the machine invented by the Jesuit Castel. Diderot, on the other hand, returned to the idea again and again, and mentions it in the *Encyclopædia*.—(A.)]

and-dumb man calls to mind the attention he has observed us pay to music and to musicians, and the evidences of joy or grief depicted on our countenances and in our gestures as we listen to beautiful music, and when he compares them with the similar effects produced by speech or by visible objects, he cannot imagine that music has no definite meaning and that vocal and instrumental music arouses in us no distinct impressions.

And is not this, sir, an exact symbol of the way in which we form ideas, our theories, and, in a word, the conceptions by which so many philosophers have won fame? Whenever they attempt to explain matters which seem to demand another organ which is lacking before they can be completely understood, they have often shown less penetration and have wandered further from the truth than the deaf mute I have been describing; for, after all, if we do not express our thoughts as distinctly by means of musical instruments as with our lips, and if musical notes do not convey our ideas as distinctly as speech, yet they do convey something.

The blind man I described in the *Letter on the Blind*¹ assuredly displayed great penetration in his conception of the use of the telescope and spectacles, and his definition of a mirror is very remarkable; but there is more profundity and truth in my deaf-mute's notion of Father Castel's harpsichord and of our music and musical instruments. Even if he did not hit upon the exact truth, he hit upon a great

¹ See *Letter on the Blind*, pp. 72-73.

possibility. This penetration will surprise you less, perhaps, if you fancy that everyone who walks through a picture gallery is really unconsciously acting the part of a deaf man who is amusing himself by examining the dumb who are conversing on subjects familiar to him. This is one of the points of view with which I always look at pictures ; and I fancy it a sure means of divining ambiguous actions and equivocal movements ; of being at once aware of the frigidity and confusion of an ill-arranged action or of conversation ; and of seeing at once, in a scene rendered in painting, all the faults of languid or exaggerated acting. The term "acting" which I have just used, because it expresses what I mean, calls to my mind another mode of studying which I often employed and which taught me more about actions and gestures than all the books in the world. I used to frequent the theatre, and I knew by heart most of our best plays. On the days when I meant to examine actions and gestures I would climb to the gallery, for the further I was from the actors the better. As soon as the curtain was raised, and the rest of the audience disposed themselves to listen, I put my fingers in my ears, much to the astonishment of my neighbours ; not knowing my motives, they looked on me as a madman who only came to the play to miss it. I paid no attention to their remarks, and kept my fingers obstinately in my ears as long as the gestures and actions of the actor corresponded with the dialogue which I remembered. When I was

puzzled by the gestures I took my fingers from my ears and listened. Ah, how few actors there are who can stand such a test, and how humiliated the majority would be if I were to give the world my criticisms! But judge of my neighbours' surprise when they saw me shed tears at the pathetic passages, though I had my fingers in my ears. That was too much for them, and even the least inquisitive began to question me. But I coolly answered that "everybody had his own way of listening, and mine was to shut my ears to hear the better," and found some silent amusement in the comments caused by my real or apparent eccentricity and in the simplicity of some young people who also tried putting their fingers in their ears to hear as I did, and were surprised at their lack of success.

Whatever you may think of my expedient, pray consider that if, to judge correctly of intonation, we must listen to an actor without looking at him, it is very natural to watch an actor without hearing him, if we are to judge correctly of his gestures and action. I may add that the celebrated writer of plays, Le Sage, the author of *The Lame Devil*, *The Bachelor of Salamanca*, *Gil Blas of Santillana*, *Turcaret*, and a number of plays and comic operas in which his son, the inimitable Montmeny, took part, became so deaf in his old age that people had to shout into his ear-trumpet. Yet he was in the habit of frequenting the theatre to see his pieces played, and could follow them almost word for

word ; indeed, he said he was a better judge of his plays and their action when he could no longer hear the actors ; and I am certain, from my own personal experience, that he was right.

In studying gesture language it appears to me the principal idea should be presented first, because it throws light on the rest as indicating what the succeeding gestures refer to. When the subject of a proposition in oratory or gesticulation is not announced, the significance of the other gestures or words remains uncertain. This is certainly the case in Greek or Latin phrases, but not in the language of gesture when properly constructed. Suppose I am at table with a deaf-mute, and he wishes to tell his servant to give me some wine. He first beckons to his servant, then looks at me, then he imitates the action of a man pouring out wine. In this sentence it hardly matters which of the last two signs comes first : the deaf mute, after beckoning to his servant, may either begin with the sign representing his order or that denoting the person whom the order concerns ; but the position of the first gesture cannot be altered. Only an illogical mute could displace it. For this displacement would be as absurd as a man speaking without knowing whom he was addressing. As to the order of the two other gestures, it is a matter of taste, fancy, suitability, and harmony of style, and does not affect the sense. As a rule, the more ideas there are in a sentence, and the more possible arrangement of gestures or other signs there are, the greater

danger of falling into contradictions, ambiguities, and other faults of construction. I do not know if we can justly estimate a man's opinions and morals by his writings, but I think we can form a good judgment of his intellectual abilities from his style, or rather his manner of constructing sentences. I can at least say that I have never found myself mistaken in my judgment. I have observed that every writer whose sentences had to be completely re-written would also have required an entirely new brain before he was fit for anything.

But how is it possible in a dead language to use correct constructions when there are so many possible ways of arranging words? Our language is so simple and uniform that I venture to say it will be easier to write and speak French correctly, if it were to die, than it is possible to write Latin and Greek now. How many inversions do we use to-day in Latin and Greek which would not have been permitted in the days of Cicero and Demosthenes and which the refined ears of those orators would have rejected?

But, people will tell me, have we not in our language adjectives which are only used before a substantive, and others which are only used after? How can our posterity learn these fine distinctions? Reading good authors is not enough. I agree with you; and if the French language dies, future savants, who care enough for our literature to learn and write our language, will be sure to write indifferently *blanc bonnet* or *bonnet blanc*, *méchant auteur* or *auteur*

méchant, homm. galant and *galant homme*, and a vast number of similar phrases which would make nonsense of their writings were we to rise up to read them, but which would not prevent their ignorant contemporaries from exclaiming when they read some such piece: "Racine did not write more correctly," or "That is just like Despreaux; Bossuet could not have said it better; this prose has the music, the force, the elegance and ease of Voltaire's." But if a limited number of difficulties may cause those who come after us to stumble, what are we to think of our modern Greek and Latin authors and of the admiration they obtain?

In talking to a deaf-mute it is found to be almost impossible to describe to him indefinite portions of quantity, number, space, or time, or to make him grasp any abstract idea. One can never be sure that he realises the difference in tense between *I made*, *I have made*, *I was making*, and *I should have made*. It is the same with conditional propositions. If, then, I was right in saying that at the origin of language men first named the principal objects of sense, such as fruit, water, trees, animals, serpents, etc., and then named passions, places, and persons, qualities, seasons, etc., I may add that signs for periods of time and tenses were invented last of all. I imagine that for long centuries men had no other tenses than the present indicative and the infinitive, which became, according to the circumstances, either a future or a past.

I am supported in this conjecture by the present

state of the *lingua franca*—the language spoken by the various Christian nations trading with Turkey and the Levant ports. I believe it is the same to-day that it has always been, and that it will never develop. Its base is a corrupt Italian. The present infinitive is used for every tense, and its meaning is modified by guessing and by the other words of the sentence. Thus, *I love thee, I was loving thee, I shall love thee*, are all in *lingua franca*, “*mi amarti.*” *All have sung, Let each one sing, All will sing*, are “*tutti cantara.*” *I wish, I was wishing, I have wished, I should like to marry you*, are “*mi voleri sposarti.*”

I imagine that inversions have crept into a language and been preserved in it because gesture language gave rise to the language of oratory, and that they naturally retained the position thus assigned to them in the sentence. I also think that, for the same reason, as tense was not accurately defined even after conjunctions were formed, some languages, like Hebrew, which has no present or imperfect, did without certain tenses. They said *Credidi propter quod locutus sum* instead of *Credo et ideo loquor*: *I have believed, and therefore I have spoken*, instead of *I believe, and therefore I speak*.

In other languages the same tense had two different meanings, as in the Greek language, where the aorist is at one time expressive of the present, at another of the past. Let me quote as an illustration—there are many others—a passage in the *Enchiridion*, which is perhaps not so familiar to you

as some. Epictetus says : Θέλουσι καὶ αὐτοὶ φιλοσοφεῖν. "Ἀνθρωπε, πρῶτον ἐπίσκεψαι, ὁποῖον ἐστὶ τὸ πρᾶγμα· εἶτα καὶ τὴν σεαυτοῦ φύσιν κατὰμαθε, εἰ δύνασαι βαστάσαι. Πένταθλος εἶναι βούλει, ἢ παλαιστής; ἴδε σεαυτοῦ τοὺς βραχίονας, τοὺς μηρούς, τὴν ὀσφῦν κατὰμαθε (ch. xxix). A close translation is : "These men also wish to be philosophers ; O man, first *have learnt* what it is that you wish to be, *have studied* your strength and the burden, *have considered* your arms and thighs, *have tried* your loins if you intend to be a pentathlete or a wrestler." This can be much better translated by substituting the present for the first and second aorists ; thus : "These men also wish to be philosophers. Man, first learn what it is you wish to be ; study your strength, and the burden ; consider your arms and thighs ; try your loins if you intend to be a pentathlete or a wrestler." The pentathlete, as you know, was one who intended to enter for all the gymnastic exercises.

I consider these eccentricities of tense as the result of the original imperfection of languages and the traces of their original rudimentary state, against which common sense (which does not allow one and the same expression to render different ideas) vainly strove in after times. It was in vain ; the usage was fixed, and use won a victory over common sense. But there was, perhaps, not a single Latin and Greek author who was aware of this defect. I go further, and maintain that every Greek and Latin author probably imagined in their speeches and writings that their words exactly

followed the order of their ideas. But evidently it was not so. When Cicero begins his oration *pro Marcello* by *Diuturni silentii, Patres conscripti, quo eram his temporibus usus*, etc., we can see that he was thinking of something before his "long silence"—an idea which was to follow and break in upon his "long silence," and which caused him to say *Diuturni silentii* instead of *Diuturnum silentium*. This remark upon the inversion of the beginning of this oration applies equally to all cases of inversion; as a rule, in all Greek and Latin periods, however long they may be, we observe at once that the writer had some reason for preferring to use certain cases, and that there was not the same inversion in his ideas as in the order of his words. In the above sentence of Cicero's, what made him use the genitive case in *Diuturni silentii*, the ablative in *quo*, the imperfect tense in *eram*, and so on, was the order of ideas pre-existing in his mind which did not coincide with the order of the words—an order he obeyed unconsciously, from a long practice in transposition. Why should Cicero not have used inversion unconsciously, since we, who think our language follows the natural order of ideas, do so too? I was therefore justified in distinguishing between the natural and the acquired or scientific order of ideas and signs.

You thought, sir, it might be argued, that there was no inversion in that period of Cicero's; you are mistaken, but two considerations which have escaped your notice will convince you. The first is, that as

inversion proper, or the acquired, scientific and grammatical order, is really an order in words which does not correspond to the order in ideas, what is inversion for one is not so for another, for different minds may put their words in different order. For instance, in the sentence *serpentem fuge* I would ask you which is the principal idea. You may say that it is the serpent, but another will say it is flight; and both of you may be right. A timid man thinks only of the serpent; but the man who fears my danger more than he fears the serpent thinks only of my flight: one is overwhelmed by terror, the other gives me warning. The second thing I would remark is, that when we are presenting a series of ideas to others, and the main idea we wish to impress upon them is not the one by which we ourselves are most impressed (because we and our hearers are differently situated), it is this former idea which we should present first, and such an inversion is but a matter of oratory. Let us apply these observations to the first period of the oration *pro Marcello*. I picture to myself Cicero mounting the tribune to speak to the people; and I see that the first idea that will strike his audience is that it is a long time since he spoke to them; hence *diuturni silentii*, his prolonged silence, is the first idea he must present to them, although the principal idea in his mind is rather *hodiernus dies finem attulit*; for the orator's main preoccupation is the speech he is about to make, not his past silence. I notice another reason for the use of the genitive case in *diuturni silentii*;

the audience could not realise the fact of Cicero's prolonged silence without seeking for the cause of it, and why he was at last breaking it. Now the genitive, being a case incomplete in itself, induces the minds of his hearers to travel onwards to meet the ideas that the orator could not present at once.

These are, sir, the remarks upon the passage in question which you might have made. I am sure Cicero would have arranged this period quite differently, if, instead of speaking at Rome, he had been suddenly transported to Africa to plead at Carthage. This will show that what was not an inversion for Cicero's hearers would be and must be one for the orator himself.

But to go a little further: I hold that when a phrase only contains very few ideas, it is very difficult to determine the natural order of these ideas in relation to the speaker; for if they are not all presented at once, their succession is so rapid that it is often impossible to decide which strikes us first. Who can say if the mind cannot embrace a certain number at one and the same instant? Perhaps you will call this paradoxical; but let us examine together how the article *hic, ille, le* came to be introduced into Latin and into our language. It will not be a long or difficult matter, and may induce you to accept a position that you find distasteful at present.

Let us first transport ourselves to the period when Latin adjectives and substantives which denoted the qualities perceived by sense in various natural objects

were almost all invented, but when no expression had yet been found for those intellectual subtleties which philosophy has even to-day much difficulty in distinguishing. Next imagine two hungry men, one of whom could see no food, while the other stood beneath a tree so very tall that he could not reach its fruit. Their sensations make both these men speak; the first would say: *I am hungry, I would like to eat*; and the second, *What beautiful fruit! I am hungry, I would like to eat*. Now, it is obvious that the former has adequately expressed in words all that passed in his mind; while the latter has left something unexpressed—a portion of his thought must be supplied. The expression *I would like to eat*, when no food is to be seen, applies generally to all food that could appease hunger; but the same expression is limited in its application, and refers only to a fine fruit when that fruit is to be seen. Thus, though they both said *I am hungry, I would like to eat*, the man who exclaimed “What a fine fruit!” returned in thought to this fruit, and I make no doubt that if the article *le* had been in use he would have said: *What fine fruit! I am hungry; I would like to eat this* (or this I would like to eat). The article *le* or *celui* in this case and in other similar cases denotes that the mind reverts to an object which it had previously considered, and the invention of this symbol is, I think, a proof of the progress of the mind.

Do not raise difficulties about the position this word ought to occupy in the sentence in accordance

with the natural order of ideas, for though these statements, *What fine fruit! I am hungry, I would like to eat that*, are each expressed by two or three words, each only denotes a single notion; the mid-most sentence, *I am hungry*, is expressed in Latin by a single word *esurio*. The fruit and its quality are perceived at the same time; and when a Roman said *esurio* he only imagined he was expressing a single idea. *I would much like to eat that* are only modes of single sensation. *I* denotes the person who experiences it; *would like to eat*, the desire and the nature of the sensation experienced; *much*, its intensity; *it*, the presence of the desired object. But in the mind there is not the successive development we observe in speech; if it had twenty mouths, and each mouth able to say a word, all the above ideas would be expressed at once. This could be excellently executed on Father Castel's harpsichord, if our dumb friend's theory were in practice and each colour combined to form words. No tongue would approach it in the rapidity of its speech. But as we have not many mouths, people have attached several ideas to a single term. If there were more of these vigorous terms, instead of the tongue panting after the mind, such a number of ideas could be expressed at once that the mind would lag after the tongue which hastened in advance of it. What would then be the fate of inversion, which implies a disintegration of many simultaneous mental impressions and a number of words? Although we have few words equivalent to a long

speech, we have some, and Greek and Latin are full of them ; they are at once understood when used, and this is . proof that the mind experiences a multitude of sensations, if not simultaneously, yet in such rapid succession that it is impossible to distinguish their order.

If I had to explain this system of the human understanding to one who found it difficult to grasp abstract ideas, I should say, "Consider man as a walking clock ; the heart as its mainspring, the contents of the thorax as the principal parts of the works ; look on the head as a bell furnished with little hammers attached to an infinite number of threads which are carried to all corners of the clock-case. Fix upon the bell one of those little figures with which we ornament the top of our clocks, and let it listen, like a musician who listens to see if his instrument is in tune : this little figure is the soul. If many of these little threads are pulled at once, the bell will be struck several times, and the little figure will hear several notes simultaneously. Imagine that there are some of these threads that are always being pulled ; and just as we only notice the noise of Paris by day when it ceases at night, we shall be unconscious of some sensations which are continuous, such as of our existence. The mind, especially in health, is unconscious of its own existence, unless it deliberately examines itself. When we are well, we are unconscious of any part of our body ; and if any part draws attention to itself by pain, we are certainly not well ; and if it is by a pleasurable

sensation, it is by no means certain that we are the better for it."

I could pursue my analogy still further, and add that the sounds produced by the bell do not die away at once, but have some duration; that they produce chords with the sounds that follow, and the little figure that listens compares them, and pronounces them harmonious or dissonant; that memory, which we need to form opinions and to speak, is the resonance of the bell; the judgment, the formation of chords; and speech, a succession of chords. It is not without reason that some brains are said to be "cracked," like a bell. And is not the law, which is so necessary in a series of harmonies, of having at least one note common to the chord and that following it, also applicable? Does not this common note resemble the middle term of a syllogism? And what else is the likeness we observe in certain minds but the result of some freak of nature by which two intervals are marked, one a fifth and the other a third, in relation to another note? By this fertile analogy, and with all the madness of Pythagoras, I might demonstrate the wisdom of that Scythian law which prescribed one friend as a necessity, permitted two, and forbade three. Among the Scythians, I might say, a man was "out of tune" if the note which he gave forth found no harmonic among his fellow-men; three friends would make a perfect accord; while a fourth superadded would be but a repetition of one of the former three, or would introduce a discordant note.

But enough of this language of metaphor, which at best is but fitted to amuse and arrest the volatile mind of a child ; let us come back to philosophy, which requires arguments and not analogies.

When people examined the various utterances called forth by the sensations of hunger and thirst, they observed that the same terms were used to express different notions ; and the symbols *you, he, me, the*, and many others, were invented for the sake of precision. A mental state during an indivisible moment of time was expressed by a number of words which divided the complete expression into a number of parts ; and because these words were uttered one after another, and were only understood in the order they were spoken, it was thought that the sensations they expressed were experienced by the mind in the same order. But this is not the case. Our mental state is one thing, our analysis of it quite another. This is so, whether we analyse it to ourselves or to others. The complete and instantaneous perception of this state is one thing ; the detailed and continuous effort of attention we make to analyse it, state it, and explain it to others, another. Our mind is a moving scene, which we are perpetually copying. We spend a great deal of time in rendering it faithfully ; but the original exists as a complete whole, for the mind does not proceed step by step, like expression. The brush takes time to represent what the artist's eye sees in an instant. In the growth of language, decomposition was a necessity ; but to *see* an object, to *admire* it, to *experience* an

agreeable sensation, and to *desire to possess* it, is but an instantaneous emotion, rendered in Greek and Latin by a single word. This word once uttered, all is said and understood. Ah, how our understanding is modified by words, and how cold a copy of reality is the most vigorous utterance !

*Les ronces dégoûtantes
Portent de ses cheveux les dépouilles sanglantes.*¹

This is one of the most life-like pictures I know, but yet how far is it from my imagination !

I beg of you, sir, to consider these points if you wish for a juster notion of this complex question of inversion. For my part, I am fitter to gather a cloud than to scatter it, to suspend my judgment than to give a verdict ; and I am going to prove that if the paradox that I have just advanced does not hold good, and if our mind does not allow of several perceptions at one and the same time, it would be impossible to think and speak ; for thought and speech consist in the comparison of two or more ideas. Now, how is it possible to compare ideas which are not both at once present in the mind ? You allow that we can experience more than one sensation at a time ; for example, we can perceive the colour and shape of a body at the same time ; why not also abstract ideas ? Does not memory employ two ideas present at the same time in the mind—the actual idea, and the remembrance of the former ? For my part, I think that is why a good judgment and a good memory are rarely found

¹ Racine, *Phèdre*, Acte v, Scène vi.

together. A good memory presupposes a great facility in embracing various ideas at one and the same moment or in rapid succession ; and this gift interferes with the tranquil examination of a small number of ideas which the mind ought to contemplate with fixed attention. A mind stored with a huge variety of things is like a library of odd volumes ; it is like one of these German compilations bristling with Hebrew, Arabic, Greek, or Latin quotations put together without judgment or taste ; which are ponderous as it is, and which will grow more and more ponderous, and grow none the better ; a store full of analyses and appreciations and ill-digested works, and shops of mixed goods where the memorandum alone is in order ; a commentary where we scarcely ever find what we want, but often what we don't want, and almost always what we want is lost in a heap of rubbish.

It follows from the foregoing statements there is not, and perhaps there cannot be, inversion in the mind, especially if the object contemplated be an abstract one ; and though a Greek may say : *νικῆσαι δόλιμια θέλεις ; κἀγὼ, νῆ τοὺς θεοὺς κομψὸν γάρ ἐστιν* (Epictetus, *Enchiridion*, ch. xxix) and a Roman *Honores plurimum valent apud prudentes, si sibi collatos intelligent*, French syntax and common sense find this Greek and Latin syntax embarrassing, and say without any inversion : *You would like to belong to the French Academy? So should I; for it is an honourable distinction, and the wise man may value a distinction which he feels he deserves.*

I would not therefore care to maintain without distinction the general statement that the Romans did not use inversion, whereas we do. I should merely say, if instead of comparing our sentence with the order of ideas we compared it with the order of the inversion of words, with gesture-language, for which spoken language has been gradually substituted, it would appear that we invert; and we use more inversions than any other nation in the world. But if our construction is compared with that of a mind influenced by Greek and Latin syntax, we have the fewest possible inversions. We express things in French in the order the mind has to consider them, whatever the language. Cicero, if we may say so, followed the French order before obeying the Latin.

It follows that, since the communication of thought is the principal object of a language, French is of all languages the best organised, the most precise, and the most excellent, for it retains less than any other the negligences, or what I may call the lispings, of the childhood of the race: in other words, by having no inversions we have gained in clearness and precision, which are essential qualities in writing; but on the other hand we have lost in warmth, in energy, and in eloquence. I may add that the orderly and didactic movement of our language makes it peculiarly suitable for science; but the Latin, Italian, and English languages, which allow of inversion, are more suited for literature. We can express the intellect better than any other

nation, and common sense will choose French for its utterances ; but imagination and the passions will prefer the ancient tongues, and that of our neighbours, to ours. French should be the language of society and of the schools of philosophy ; Greek, Latin, and English, the language of our lecture-halls, pulpits, and theatres ; but if truth return to earth, I believe French would be her chosen speech, while Greek, Latin and the other tongues will be the language of fables and falsehoods. French is the language for teaching, enlightening, and convincing ; Greek, Latin, Italian and English for persuading, stirring the passions, and hoodwinking ; talk Greek or Latin or Italian to the multitude, but talk French to the wise.

Another drawback to languages with inversions is that the attention of the reader or hearer is taxed. How many cases, tenses, and terminations are there not to bear in mind in a long Greek or Latin sentence ? It is almost incomprehensible until one reaches the last word ; while in French there is none of this strain, and we can understand as we go along. Ideas in our language are presented in the order they presented themselves to the mind, whether the mind be Greek or Latin. La Bruyère is less fatiguing to read in the long run than Livy, though the former is a profound moralist, the latter a simple historian ; but the historian sets his sentences and phrases so artificially, that we are continually removing them from their sockets, and restoring them to their clear and natural order,

and insensibly weary of the toil, just as the strongest arm wearies of a small weight which is constantly carried. So, take it all in all, our pedestrian language has the advantage of facility over the others.

But there is a motive which exists in French and in the ancient tongues disturbs the natural order of ideas, and that is the desire for harmony of style—a desire which is now become so imperative that we are ready to sacrifice a great deal to it. For we must distinguish between three phases that all languages pass through when they have left that earliest stage when they were merely a confusion of cries and gestures which we may call the animal phase. These three phases are birth, development, and perfection. The newly-born language was made up of words and gestures in which adjectives without gender or case and verbs without tenses and not governing cases preserved the same terminations throughout. In the developed language there were words, cases, genders; and verbs were conjugated and governed cases. In fact, there were all the necessary signs for expressing thought, but nothing more. In the perfected language, beauty was required; for people thought the ear must be pleased as well as the mind. But as the subsidiary is often thus set before the principal thing in the sentence, the order of ideas is often disturbed to procure this harmony of style. This is what Cicero has done in part of his opening period in the *pro Marcello*; for the first idea that he should have

presented to his hearers, after that of his long silence, was the reason for this silence. He should therefore have said: *Diuturni silentii, quo, non timore aliquo, sed partim dolore, partim verecundia, eram his temporibus usus, finem, hodiernus dies attulit.* Compare this sentence with the original, and you will find no reason why it should not have been used by him, except that of harmony. Another instance is the great orator's phrase, *Mors terrorque civium ac sociorum Romanorum,*¹ where it is evident that the natural order required *terror morsque.* There are a number of other examples I could quote.

This leads us to the question whether the natural order should be sacrificed for the sake of harmony. I think this is permissible when the inverted ideas are so close to one another that they strike the ear and mind almost at the same moment; just as we transpose the fundamental bass into a higher clef to make it more tuneful, although the transposed bass will only be agreeable so long as the ear can distinguish the natural progressions of the fundamental bass which suggested it. Do not think from this remark that I am a great musician; it is only two days ago that I began to be one; but you know how one likes to parade some new accomplishment. I think we might discover several analogies between musical harmony and harmony of style. When, for instance, we are about to describe some great or wonderful events, the harmony of style must be sacrificed or at least disturbed. So we say:

¹ "The death and panic of the Roman citizens and their allies."

*Magnum Jovis incrementum.*¹

Nec brachia longo

*Margine terrarum porreberat Amphitrite.*²

*Ferte citi ferrum, date tela, scandite muros.*³

Vita quoque omnis

*Omnibus e nervis atque ossibus exsolvatur.*⁴

*Longo sed proximus intervallo.*⁵

In a similar manner in music we must sometimes shock the ear in order to surprise and please the imagination. We may also observe, that though these licences in the order of words are only permitted for the sake of the harmony of style, licences in harmony, on the other hand, are chiefly taken to arouse and give rise in the most natural order to the ideas which the musician wishes to express.

In speech we must distinguish between thought and expression ; if thought is expressed with purity, clarity, and precision, this is quite sufficient for ordinary conversation ; if you add to these a certain distinction in the use of words and a certain rhythm and harmony, you will have a style well fitted for an orator, but you will still be far removed from poetry, especially from the grand style of the epic and the ode. There is a spirit in the poet's language which moves there and breathes life into each syllable. What is this spirit? I have felt its presence, but find it difficult to describe. I may say that it states and paints objects at the same time ;

¹ Virgil, *Bucol.*, Eclog. iv, v. 49.

² Ovid, *Metam.*, lib. i, vv. 13-14.

³ Virgil, *Æneid*, lib. ix, v. 37.

⁴ Lucretius, *De rerum nat.*, lib. i, vv. 810-811.

⁵ Virgil, *Æneid*, lib. v, v. 320.

it appeals not only to the understanding, but to the soul which it stirs and the imagination that sees and the ear that hears. The lines are not merely a chain of vigorous words which express the thought both forcibly and nobly, but a series of hieroglyphs, one after another, which picture the thought to us vividly. I might say that all poetry is symbolic.

But it is not everyone who can understand these symbols. In order to feel their full force we must be, as it were, in the creative mood. The poet says :

*Et des fleuves françaises les eaux ensanglantées
Ne portaient que des morts aux mers épouvantées.*¹

Does everybody appreciate the value of the first syllable of the word *portaient*, which paints us the waters swollen with corpses and the stream choked, as it were, by this obstacle? And in the second syllable of the word, does everyone see the mass of waters and dead bodies subsiding and moving out to sea? The terror of the sea is brought before us all in the word *épouvantées*, but the stress laid on the third syllable brings before me the vast extent of the ocean. Again, the poet says :

*Soupire, étend les bras, ferme l'œil et s'endort.*²

All exclaim, "How fine!" but it is not by counting the syllables on one's fingers that we can judge how fortunate the poet was, when expressing a sigh, to have such a word as *soupire* with its long-drawn sound. We read *étend les bras*, but we hardly realise

¹ Voltaire, *Henriade*, chant ii, v. 357.

² Boileau, *Lutrin*, chant ii, v. 164.

how the impression of length and lassitude is expressed by the long monosyllable *bras*, and the "outstretched arms" fall so reposefully on the ear at the close of the first hemistich of the line. Do we notice the rapid movement of the eyelid in *ferme l'œil* and the almost imperceptible change from wakefulness to sleep at the close of the second hemistich *ferme l'œil et s'endort*?

The cultivated reader will of course observe that the poet has four actions to represent, and that his line is divided into four parts; that the two last actions are closely interrelated, and that they have scarcely an interval between them; and that the two last and corresponding parts of the line are also closely linked, united as they are by the rapidity of the movement of the penultimate part and by a conjunction; that each of the actions takes only its proper proportion of time in the verse; and that as all four actions are comprised in this small space, the poet has expressed their rapid succession in nature. That is the kind of problem that the poet's genius solves unconsciously; but do his readers realise his skill? Certainly not; and I shall not therefore be surprised if those readers of Boileau (and there are many) who have not understood the meaning of his symbols laugh at my commentary, and, remembering the *Chef-d'œuvre d'un inconnu*,¹ treat me as a visionary.

¹ *Le chef-d'œuvre d'un inconnu, avec des remarques savantes*, par M. le docteur Chrysostome Mathanasius, La Haye, 1714. This little *jeu d'esprit* was the work of Themiseul de Saint Hyacinthe, S'Grave.

I used to think, like everybody else, that one poet could translate another, but I have found out my mistake. The thought can be rendered, and perhaps by good fortune the equivalent expression. Homer said: ἔκλαυξεν δ' ἄρ' οἰστοὶ (*Iliad*, Cant. i, v. 46) and *tela sonant humeris* is Virgil's version (*Æneid*, lib. iv, v. 149). That is something, but not all; the suggestive symbolism, the subtle hieroglyphs which pervade a long description, and which depend on the distribution of long and short syllables in an unaccented language and on the distribution of vowels between consonants in all languages, disappear even in the best translation.

Virgil writes of Euryalus stricken by a mortal wound:

*Pulchrosque per artus
It cruor, inque humeros cervix collapsa recumbit :
Purpureus veluti quum flos, succisus aratro,
Languescit moriens ; lassove papavera collo
Demisere caput, pluviam quum forte gravantur.*¹

I should just as soon expect these lines to have sprung from letters scattered at haphazard, as that

said, Sallengre, Prosper Marchand, and others, who wrote admiring comments in all languages upon the words of a song beginning:

“L'autre jour Colin malade
Dedans son lit
D'une grosse maladie
Pensant mourir.”

The authors were ridiculing German scholarship.—(A)

¹ *Æneid*, lib. ix, vv. 433-437:

Blood trickles o'er his limbs of snow,
His head sinks gradually low ;
Thus severed by the ruthless plough,
Dim fades a purple flower :
Their weary necks so poppies bow
O'erladen by the shower.

(*Trs.* Conington.)

a translation could render all the suggestive beauties : the gush of blood, *it cruor* ; the drooping head of the dying lad, *cervix collapsa recumbit* ; the sound of the scythe,¹ *succisus* ; the languor of death, *languescit moriens* ; the softness of the poppystalk, *lassove papavera collo* ; and the *demisere caput* and *gravantur* suitably complete the picture. *Demisere* is as soft as the stalk of a flower ; *gravantur* is as heavy as its cup heavy with rain ; *collapsa* expresses effort and relapse. The same symbolic suggestion is to be found in *papavera* ; the first two syllables show the poppy with head erect, and in the last two it droops. All these pictures are compressed in these four lines of Virgil. You have been affected by the happy parody in Petronius² of Virgil's *lassove papavera collo* applied to the exhaustion of Ascyllus when he quits Circe ; and you would not have so keenly appreciated Petronius' use of the phrase if you did not recognise in it a faithful picture of the plight of Ascyllus.

This analysis of Virgil ought to be enough for me ; and after drawing attention to more beauties than are perhaps to be found in the original—certainly more than the poet deliberately thought of,—my imagination and taste ought to be completely satisfied. No, sir ; I am about to expose myself to two criticisms—of having seen beauties that were

¹ *Aratrum* does not mean a scythe, but the reason for this rendering will appear a little further on.—(D)

*Illa solo fixos oculos aversa tenebat
Nec prius incepto vultum sermone movetur
Quam lentæ salices, lassove papavera collo.*

Satyricon.—(Br)

not there, and criticised defects that were also non-existent. Now for it. I think the word *gravantur* is a little too heavy for the light poppy flower, and the *aratro* following *succisus* does not to me complete the suggestive picture. I am convinced Homer would have concluded his line with a word that would have continued the sound of a cutting implement, or have depicted to my imagination the soft drooping of a flower.

It is the recognition of, or rather the vivid feeling for these symbolic expressions which are lost on the ordinary reader, that discourages men of genius from attempting a translation. That is why Virgil said that it is as difficult to take a line from Homer as to snatch a nail from the club of Hercules. The more a poet uses this symbolism, the more difficult he is to translate, and Homer is full of such suggestive symbols. Let me quote those lines where Jupiter with his dark brows confirms to ivory-shouldered Thetis his promise to avenge the injustice done to her son :

Ἦ, καὶ κτανέησιν ἐπ' ὄφρύσι νεύσει Κρονίων·
 Ἀμβρόσιαι δ' ἄρα χεῖται ἐπεβρώσαντο ἄνακτος
 Κρατὸς ἀπ' ἀθανάτοιο· μέγαν δ' ἐλέλιξεν Ὀλυμπον.
Iliad, i, 528-530.¹

How many images there are in these three lines ! We see Jupiter's frown in ἐπ' ὄφρύσι, in νεύσει Κρονίων, and especially in the happy repetition of the letter *k* in ἦ, καὶ κτανέησιν; his flowing locks are expressed in ἐπεβρώσαντο ἄνακτος; the immortal head of the

¹ "He spake and nodded with his dark-hued brows; and the ambrosial locks from his immortal head shook; and great Olympus trembled."

god is majestically lifted by the elision οἱ ἀπὸ ἰν κρατὸς ἄπ' ἀθανάτοιο; the shaking of Olympus is expressed in the two first syllables of ἐλέλιξεν; the size and sound of Olympus in the last syllables of μέγαν and ἐλέλιξεν and in the last word where *all Olympus trembles with its close*.

The line which I have just written is the feeble rendering of two symbols—one from Virgil, the other from Homer; one of shock, the other of fall:

And all Olympus trembles with its close.

. Ἐλέλιξεν Ὀλυμπον.
. Procumbit humi bos.¹

It is the repetition of the letter *l* in ἐλέλιξεν Ὀλυμπον which gives the idea of trembling and shock. The same repetition of *l*'s is found in my "Olympus trembles"; but as the *l*'s are not so close together as in ἐλέλιξεν Ὀλυμπον, the shaking is less rapid and also less like the movement of frowning brows. "Trembles with its close" represents *procumbit humi bos* fairly well, though the last word of my line is less heavy and emphatic than *bos*, which is a greater contrast with the word *humi* than *close* is with the short words immediately preceding it. Virgil's monosyllable is thus more isolated than mine, and the fall of his ox heavier and more complete than the close of my line.

An observation I may make here, which is just as apposite as the speech of the Emperor of Mexico in the chapter about coaches in Montaigne,² is that people had a singular veneration for the ancients,

¹ *Aeneid* lib. v, v. 481.

² *Essais*, liv. iii, ch. vi.

and a great tear of Boileau, when they asked him if the three following lines of Homer,

Ζεῦ πάτερ, ἀλλὰ σὺ ρῦσαι ὑπ' ἡέρος υἱας Ἀχαιῶν·
 Ποίησον δ' αἴθρην, δὸς δ' ὀφθαλμοῖσιν ἰδέσθαι·
 Ἐν δὲ φάει καὶ ὄλεσσον, ἐπεὶ νύ τοι εὐαδεν οὕτως.

(*Iliad*, Cant. xvii, v. 645.)

were to be interpreted as Longinus¹ had interpreted them, and as Boileau and La Motte had translated them, or not.

These are the true feelings of a warrior, cry Boileau² and the orator Longinus. He does not ask for his life to be spared, for a hero is above such a weakness; but as he sees no opportunity of showing his courage in the midst of darkness, he is provoked at not fighting; he therefore is anxious to ask for daylight, so that his end may at least be worthy of him, even if he has to fight with Jupiter himself.

Well, sir, I shall answer Longinus and Boileau: it is not a question here of the feelings of a warrior, nor what he would say in the circumstances in which Ajax is placed (Homer apparently knew these things as well as you), but of translating these lines of Homer correctly. And if it turns out that there are none of these sentiments you praise in these lines, what becomes of your praises and reflections? What must we think of Longinus, La Motte, and Boileau, if we find they have invented and inserted

¹ *Treatise on the Sublime*, section ix.

² Grand Dieu ! chasse la nuit qui nous couvre les yeux
 Et combats contre nous à la clarté des cieux.

Boileau, translating the *Treatise on the Sublime*, ch. vii.

impious boasting in the place of a sublime and touching prayer? Now, this is just what has happened. Read these three lines of Homer as many times as you please, and you will find nothing but "Father of gods and men, drive away the darkness which covers our eyes, and, since you have resolved to slay us, let us die in the light."

And must we thus without a struggle die?
Great God, drive off the darkness from our eyes,
And let us perish under open skies.

This translation does not give the pathos of Homer's lines, but at any rate it avoids the nonsense of La Motte and Boileau.

There is no defiance of Jupiter here, nothing but a hero ready for death, if it be the will of Jupiter, and asking no grace but to die fighting. *Ζεῦ πάτερ, Jupiter, Pater!* Is that how the philosopher Menippus addresses Jupiter?

At the present day, when we are no longer at the mercy of the lines of the redoubtable Boileau, and the philosophic spirit has taught us to see in things only what is actually there and to praise only what is truly beautiful, I appeal to the learned men and men of taste, to Monsieur de Voltaire, to Monsieur de Fontenelle, and others, and I ask them if Boileau and La Motte have not spoilt Homer's Ajax, and Longinus vainly attempted to add to Homer's beauties. I recognise the greatness of Longinus, Boileau, and La Motte; but I am not attacking them, only defending Homer.

This passage of Jupiter's oath and many others I

could quote are sufficient evidence that it is useless to try to add to Homer's beauties; and Ajax' speech is proof positive that in trying to add beauties to him there is a risk of destroying the genuine beauties of the original. However talented we are, we cannot write better than Homer, when he is at his best. At any rate, let us understand him before trying to outdo him. But he is so full of that poetic symbolism I was just now speaking of, that we cannot claim that we have completely understood him when we have only read him ten times. We might say that Boileau in literature has suffered the same fate as Descartes in philosophy, and it is through them we have learnt to correct their minor errors.

If you ask me when this hieroglyphic use of syllables was introduced into a language, whether it is a peculiarity of a language in its early stage or in the formative period, or of the perfected period, I make answer that when men contrived their primitive language they were apparently only influenced by the facility or difficulty of pronouncing certain syllables, and this facility (or difficulty) was conditioned by the conformation of the organs of speech. They did not seem to have considered what relation the elements of these words might have from their quantity or sound to the physical characteristics of the objects they stood for. The vowel A, which is the easiest to pronounce, was first used, and it was modified in various ways before another sound was employed. The Hebrew lan-

guage supports this conjecture ; most of its words are modifications of the vowel A, and this peculiarity is in harmony with the traditions of this people's antiquity. If we examine Hebrew closely, we shall incline to consider it the language of the primitive inhabitants of the earth. As for the Greeks, they must have had the use of speech for a long time and have thoroughly practised the subtleties of pronunciation before they introduced quantity, harmony, and syllabic imitation of noises and actions. On the analogy of children, who, when they wish to denote an object whose name is not known to them, substitute for the name some of the object's sensible peculiarities, I conjecture that it was during the transition from the primitive stage to the formative that language became enriched with syllabic harmony, and that rhythmic harmony was introduced into writings as the language passed from the formative to the perfected stage.

Whether these periods correspond to the actual development of language or no, one who has no feeling for the symbolic significance of words will often only appreciate the definite significance of epithets, and will be apt to call them superfluous ; he will criticise ideas as loose, and images as far-fetched, because he is blind to their subtle relation to the subject ; he will not see that in Virgil's *it cruor* the word *it* resembles in sound a gush of blood and the falling of rain-drops on the leaves of a flower, and so he will lose one of the trifles which are all-important among the best writers.

Reading the most lucid poets, therefore, is not without its difficulties ; and I can assure you there are a thousand men who can understand a geometrician for one who can understand a poet ; since there are a thousand men who have common sense for one man who has taste, and a thousand men of taste for one whose taste is exquisite.

I am told that in the Abbé de Bernis' discourse when Monsieur de Bissy was received into the French Academy, Racine was blamed for want of taste in the passage where he speaks of Hippolytus :

*Il suivait, tout pensif, le chemin de Mycènes ;
Sa main sur les chevaux laissait flotter les rênes ;
Ses superbes coursiers, qu'on voyait autrefois
Pleins d'une ardeur si noble obéir à sa voix,
L'œil morne maintenant et la tête baissée,
Semblaient se conformer à sa triste pensée.¹*

If the Abbé is criticising the actual description, and not its suitability in the context, it would be difficult to find a better and more modern instance of the difficulty I just now spoke of, of reading poets.

There is nothing in these lines but speaks of depression and sorrow :

*Il suivait, tout pensif, le chemin de Mycènes ;
Sa main sur les chevaux laissait flotter les rênes.*

Les chevaux is better than *ses chevaux* ; and how well the picture of what these superb horses once were

¹ " All pensive, he followed the road to Mycenæ ; his hands loosed the reins on his horses' necks ; and his superb horses, that used to obey his voice with a noble fire, now with bent head and lack-lustre eye seemed in sympathy with their master's sadness."—*Phèdre*, Acte v, Scène vi.

contrasts with their present condition ! The nodding of a horse's head, as it jogs wearily along, is imitated in a certain syllabic nutation in the line itself :

L'œil morne maintenant et la tête baissée.

But see how the poet brings all these details round to his hero :

*Ses superbes coursiers, etc. . . .
Semblaient se conformer à sa triste pensée.*

The word "seemed" seems too cautious for a poet, for it is well known that animals attached to man are affected by the signs of his joy or sorrow : the elephant is affected by the death of his driver, the dog mingles his voice with his master's, and the horse is affected if his driver is sad. Racine's description is therefore true to life : it is a noble description and a poetic picture which a painter might reproduce successfully. Poetry, painting, good taste, and truth are all united for Racine and against the Abbé de Bernis' critique.¹

But if we were taught at *Louis le Grand* to notice all the beauties of this passage of Racine's tragedy, we were also told that they were out of place in the mouth of Theramène, and that Thésée would have had some excuse for stopping him and saying : "Enough of my son's chariot and horses ; tell me

¹ [In an addendum to this *Letter* Diderot apologises for his criticism of the Abbé de Bernis. He was at first told by a friend, who was present at the meeting of the French Academy, that the Abbé de Bernis had criticised these lines of Racine's as both misplaced and bad in themselves. He was afterwards informed that the Abbé merely criticised them as misplaced ; and, far from claiming this criticism as original, he quoted the lines as one of the most familiar instances of such misplaced eloquence.]

about him." It was not thus, the celebrated Porée told us, that Antilochus announced the death of Patroclos to Achilles. Antilochus approaches the hero with tears in his eyes, and tells him the terrible news in a few words: "Patroclos is no more. They are fighting for his body. Hector has his armour." There is more of the sublime in these two lines of Homer than in all the pompous declamation of Racine. "Achilles, you have no longer a friend, and your armour is lost." At these words we all feel that Achilles must rush into the fray. When a passage sins against truth and propriety, it is not beautiful, either in tragedy or in epic. The details in Racine's lines would only be suitable in the mouth of a poet describing the death of one of his heroes.

So our learned professor of rhetoric taught us. He possessed both taste and intelligence, and it might be said of him that he was the "last of the Greeks." But this Philopœmen fell into the same mistake as people make to-day: he filled his works too full of cleverness, and kept his taste for other people's works.

To return to the Abbé de Bernis. Did he only wish to maintain that Racine's description was out of place? That is exactly what Father Porée taught us thirty or forty years ago. Or did he wish to hold up the passage I have quoted as an example of bad taste? That is an original idea, but is it justified?

I am told that there are many well-expressed and well-reasoned passages in the Abbé de Bernis' discourse: you are more likely to know this than I, as

you always take the opportunity of hearing such things. If it happens the Abbé de Bernis' discourse does not contain the offending passage I have just spoken of, and I have received an imperfect account of it, that will make another instance of the utility of a letter for the use of those who hear and speak.

Wherever the language of signs is to be seen, whether in a line of poetry or on an obelisk, whether in a work of imagination or of mystery, it requires a high degree of imagination and penetration to understand it. But if it is so difficult to understand poetry, why is it not more difficult to write poetry? I shall be told that "everyone writes poetry," but I shall reply, "Hardly anyone writes poetry." Every imitative art has its own alphabet of signs, and I much wish some man of taste and intelligence would make a study of them and compare them. The beauties of one poet have oftentimes been compared with those of another. But one task is still unattempted—to collect the beauties of poetry, painting and music, and show their analogies with one another; to explain how the poet, the painter and the musician will express the same idea; to seize upon their most fleeting images of expression and examine the likeness, if there is a likeness, between the imagery of the different arts. I should advise you to add this as a chapter to your *Fine Arts reduced to a Single Principle*, and I should also like you to include, at the beginning of your book, a chapter to define in what the beauty of nature con-

sists.¹ For some people are of opinion that for lack of one of these chapters your treatise is without a firm foundation, and for lack of the other of little practical use. Tell them, sir, the different methods of the arts in treating the same subject, and tell them it is false that nature is only ugly when out of place. They ask me why an old gnarled and twisted oak, with its branches lopped, and which I should have felled if it grew near my door, is just the tree a painter would set by my cottage door, if he had to paint it? Is the oak beautiful or ugly? Which is right—the owner or the painter? There is no subject of imitative art which does not arouse this and other difficulties. They also want to know why a scene which is admirable in a poem is not at all suitable for a painting? In those fine lines of Virgil :

*Interea magno misceri murmure pontum
Emissamque hiemem sensit Neptunus, et imis
Stagna refusa vadis ; graviter commotus et alto
Prospiciens, summa placidum caput extulit unda ;*²

they ask why it is the painter cannot seize the striking moment when Neptune raises his head

¹ Diderot used to call Batteux' book a *headless* book, because after he had reduced all the fine arts to a single principle—that of imitating the beauty of nature,—he never explained what the beauty of nature consisted in.—Naigeon, *Mémoires*.

² Meantime the turmoil of the main
The Tempest loosened from its chain ;
The waters of the nether deep
Upstarting from their tranquil sleep
On Neptune broke : disturbed he hears,
And, quickened by a monarch's fears,
His calm broad brow o'er ocean rears.

Æneid, lib. i, v. 128 (*trs.* Conington).

above the waves? Why should the god, who then looks like a decapitated man, cut such a poor figure on the water, when the effect in the poem was so impressive? Why is it that what appeals to our imagination in poetry will not please our eyes when painted? Perhaps there is one beauty of nature for the painter and another for the poet? Heaven knows what conclusions they will draw from this theory. I hope you will deliver me from these busybodies; meantime, I am going to give you a single example of the imitation of one subject in nature by poetry, painting and music.

The subject is a dying woman. The poet will say :

*Illa, graves oculos conata adtollere, rursus
Deficit. Infixum stridit sub pectore vulnus
Ter sese adtollens cubitoque adnixa levavit ;
Ter revoluta toro est oculisque errantibus allo
Quasivit caelo lucem, ingemuitque reperia ;*¹

or

*Vita quoque omnis
Omnibus e nervis atque ossibus exsolvatur.*²

The musician will begin by descending a semitone (*a*) : *Illa, graves oculos conata adtollere, rursus deficit* ; then he will go up a fifth, and after a rest, by the still more difficult interval of a tritone (*b*).

¹ The dull eyes ope, as drowned by sleep,
Then close ; the death wound gurgles deep.
Thrice on her arm she raised her head,
Thrice sank exhausted on the bed.
Stared with blank gaze aloft, around
For light, and groaned as light she found.
Virgil, *Aeneid*, lib. iv, v. 688 (*trs.* Conington).

² And life break wholly up out of all the sinews and bones.
Lucretius, *de Rerum Nat.*, lib. i, vv. 810, 811.

Ter sese adiollens will go up a semitone (c): *Oculis errantibus alto quæsvit cælo lucem.* This little interval will express the ray of light. This is the

Exemple

a. b. c. d. d. d. f. f. e.

Je me meurs, à mes yeux le jour cesse de lui-re.

6 7 8 9 k. k. k. k. k. r. ..



FIG. 8.

dying woman's last effort. After this she will sink by scale (d): *Revoluta toro est.* She will expire at last, and breathe her last by an interval of a semitone (e): *Vita quoque omnis omnibus e nervis atque ossibus*

exsolvatur. Lucretius expresses the dying away of her strength by the weight of the two spondees—*exsolvatur*; and the musician will express it by two minims, tied (*f*): and the cadence on the second of the minims will give a very striking imitation of the vacillating motion of a dying lamp.

Now look at the painter's method of expression, and you will recognise the *exsolvatur* of Lucretius in the legs, the right arm, and the left hand. The painter who can express but a moment in time has not been able to represent so many symptoms of dissolution as the poet, but they are much more affecting; the painter shows us reality, whereas the expressions of the poet and the musician are but symbols. When the musician is an artist, the accompaniment either emphasises and strengthens the melody, or brings in new ideas which the subject demands and which the melody cannot express. Thus the first bars of the bass express a gloomy harmony, made up by a superfluous chord of the seventh, placed as it were outside the ordinary rules and followed by another chord, discordant in sound and of a diminished fifth (*g*). The rest will consist of a series of minor sixths and thirds (*h*), which are descriptive of exhaustion of strength and prepare the mind for its total extinction.

It is the equivalent of Virgil's spondees :

Alto quæsiuit celo lucem.

This is but the rough sketch, which I leave for a more accomplished hand to complete. I make no

doubt that, in this very subject I selected, instances could be found in our painters, poets, and musicians which would offer more and more striking analogies between the different arts. But I leave it to you, sir, to look for them and utilise them, for you must be painter and poet, philosopher and musician ; for you would not have attempted to reduce the fine arts to a single principle, if you had not been equally well acquainted with them all.

The poet and the orator gain by studying harmony of style, and the musician finds his compositions are improved by avoiding certain chords and certain intervals, and I praise their efforts ; but at the same time I blame that affected refinement which banishes from our language a number of vigorous expressions. The Greeks and Romans were strangers to this false refinement, and said what they liked in their own language, and said it as they liked. By over-refining we have impoverished our language ; and though there may be only one term which expresses an idea, we prefer rather to weaken the idea than to express it by some vulgar word or expression. How many words are thus lost to our great imaginative writers, words which we find with pleasure in the pages of Amyot and Montaigne ! They were at first rejected from a refined style, because they were commonly used by the people ; later on they were rejected by the common people, who always ape their betters, and they are become entirely obsolete. I believe we shall soon become like the Chinese, and have a different *written* and *spoken* language.

This, sir, is almost my last observation; we journeyed on together, and I feel it is time to quit one another. If I detain you for a moment longer as we are leaving this maze in which I have led you, it is but to recapitulate in a few words its turnings and windings.

I believed that, in order to clearly understand the nature of inversions, we should examine the formation of spoken language.

I inferred from this examination (1) that our language was full of inversions when compared with the animal language, or with the first stage of spoken language, when it existed without cases, declensions, conjugations, and syntax; (2) that if we have in French hardly any of what we call *inversion* in ancient languages, this is perhaps due to modern peripateticism, which by realising abstractions gave them the place of honour in speech.

As a consequence of these truths I thought that we could, without studying the origin of spoken language, obtain results by the study of gesture-language alone.

I suggested two methods of learning the language of gesture—experiments with a “theoretical mute,” or long conversations with one born deaf and dumb.

The idea of a theoretical mute, or taking (hypothetically) speech from a man, to get a clearer idea of the formation of language, has led me to consider man as divided into as many distinct and separate entities as he has senses; and I think that if, to form a correct judgment of an actor's intonation, we must

listen to him without seeing him, it is natural that we should look at him without listening to him if we are to form a correct opinion of his gestures.

In reference to energetic gesture-language, I related some striking examples of this, which led me to discuss a variety of the sublime which I call *sublimity of situation*.

The order that existed in the gestures of one born deaf and dumb (whose informal conversation seemed to me more valuable than experimenting with a "theoretical mute"), and the difficulty in transmitting certain ideas to this deaf-mute, led me to distinguish in spoken language between those symbols which were first introduced and those of later introduction.

I saw that the symbols which in speech denoted indefinite divisions of *quantity* and *time* were among the last to be introduced, and I realised why some languages were without several tenses, and why other languages used one tense with two meanings.

This lack of tenses in one language, and this misuse of tenses in another, led me to distinguish three stages in the formation of a language—its *primitive*, its *formative*, and its *perfected* state.

I saw, when language was formed, that men's minds were hampered by syntax, and by the impossibility of thinking in the order which reigns in Greek and Latin periods. Hence I concluded (1) that, whatever the order of words in an ancient or modern language, the writer's mind followed the order of French syntax; (2) that, as this syntax is the

simplest of all, the French language had the advantage in this and many other respects of the ancient languages.

Moreover, *I proved* by the introduction and the utility of the article *hic* and *ille* in Latin and *le* in French, and by the fact that we have to experience several perceptions simultaneously in order to form a judgment or make a speech, that when the mind is not hampered by Greek and Latin syntax the order of its ideas is not dissimilar to our syntax.

In tracing the transition of language from the formative to the perfected state we *meet with* harmony of style.

I compared harmony of style with musical harmony, and *I am convinced* (1) that the first harmony in words was the result of quantity and a certain combination of vowels and consonants, suggested by instinct; and that in sentences it was the result of the order of words; (2) that this periodic and syllabic harmony produced a sort of language of symbols which is peculiar to poetry; and I then *treated* this symbolic language, and analysed several passages of the greatest poets.

As a result of this analysis *I ventured to maintain* that it is impossible to translate a poet into another language, and that it is an easier thing to understand a geometrician than a poet.

I proved by two examples the difficulty of clearly understanding a poet: by the example of Longinus, Boileau, and La Motte, who misunderstood a passage in Homer; and by the example of the Abbé de

Bernis, who seemed to me to misunderstand a passage of Racine.

After I had defined the date when syllabic symbolism was introduced into a language, *I observed* that every imitative art had its own language of signs, and that it would be a good thing if a man of taste and learning would undertake to compare them.

Here I have hinted that this work is expected of you ; and that those of us who have read your *Fine Arts reduced to the Imitation of Beauty in Nature* demand that you should define in what beauty in nature consists.

I expect you to compare the language of signs in poetry, painting, and music ; meantime, I have ventured to make some observations of my own upon this subject.

Musical harmony, which was necessarily included in the discussion, led my thought to the harmony of speech. I said that the limitations imposed by each were much more supportable than an affected refinement which tends daily to impoverish our language ; and I emphasised this point until I came to that passage where I took leave of you.

But do not suppose, from my last observation, that I withdraw my preference for French above all the languages of antiquity and the majority of modern languages. This is still my feeling, and I still think that French is superior in utility (if not in beauty) to Greek, Latin, Italian and English.

The objection may be perhaps raised that if, as I

submit, the languages of antiquity and those of our neighbours are superior in beauty, we all know that these languages do not play us false when we wish to treat of ordinary practical matters.

But I make answer that if our language is admirable for its utility, it can also lend itself to the purposes of art. There is no rôle it has not successfully assumed. It has been gay and fanciful with Rabelais, naïve with La Fontaine and Brantôme, musical in Malherbe and Fléchier, sublime in Corneille and Bossuet. What an instrument it is in Boileau, in Racine, in Voltaire, and in a host of other writers of poetry and prose! Do not let us waste our pity on it. If we know how to use it, our works will be as precious in the eyes of posterity as the works of classical antiquity are in our own. In the hands of a commonplace man, Greek, Latin, English and Italian will utter only commonplaces, while the pen of a man of genius will work miracles with French. Whatever language it is written in, a work inspired and sustained by genius never falls or flags.

NOTES

[*Note 1.*—The specimens of the arithmetic which I have perused and reduced to common numbers are certain arithmetical tables, which he had computed and preserved for his own use; but for what purposes they seem calculated does not easily appear. They seem to have some relation to the tables of natural sines, tangents, and secants; but their full use I must leave to future inquiry. They are four pieces of solid wood, of the form of rectangular parallelepipeds, each about eleven inches long, five and a half broad, and something about half an inch thick. The two opposite faces of every one were divided into little squares after the manner of the abacus above described, but they were perforated only in the necessary places where the pins were stuck fast up to the head. Each face exhibited nine small arithmetical tables of ten numbers each; and every number, generally speaking, consisted of five places or figures.—“Dr Saunderson’s Palpable Arithmetic decyphered,” prefixed to Saunderson’s *Algebra* (1740), pp. xxiii and xxiv.]

[*Note 2.*—A blind man moving in the sphere of a mathematician seems a phenomenon difficult to be accounted for: Tully mentions it as a thing

scarce credible in his own master in philosophy, Diodorus, "that he exercised himself in philosophy with more assiduity after he became blind; and, what he thought next to impossible to be done without sight, that he professed geometry, describing his diagrams so expressly that his scholars drew every line in its proper directions."

St Jerome relates a more remarkable circumstance in Didymus of Alexandria, who, "though blind from his infancy, and therefore ignorant of the very letters, not only learnt logic, but geometry also to perfection, which seems the most of anything to require the help of sight."

Trithemius, *de Scriptoribus Eccles.*, mentions Nicaise de Voerde, at Mechlin, "who, though blind from the first year of his age, became so eminent in learning, that he taught the canon and civil law in the university of Cologne, and quoted books only from having heard them read to him." I have further heard of a Hollander, and some others, whom blindness did not hinder from excelling in mathematical learning. Indeed, if we consider that the ideas of extended quantity, which are the chief objects of mathematics, may as well be acquired from the senses of feeling as that of sight; that a firm and steady attention is the principal qualification for this study; and that the blind are necessarily more abstracted than others, we shall perhaps find reason to think there is no other branch of science more adapted to their circumstances.—*Life of Saunderson, ibid.*]

[*Note 3.*—The *elephant and tortoise* illustration had been first introduced by Locke in his criticism of the idea of substance (*Essay concerning Human Understanding*, bk. ii, ch. 13, § 19, and again ch. 23, § 2). It had been further developed by his disciple Shaftesbury (*Characteristics: the Moralists*, vol. ii, p. 15) to criticise the solutions given to the problem of the origin of evil. From Shaftesbury Diderot appears to have taken both the idea and the illustration: in paragraph xxii of his *Sufficiency of Natural Religion*, where he boldly applies to the story of Adam the ridicule which Shaftesbury seemed to cast on the myth of Prometheus only. Why does man suffer in this world? That is a mystery, says the Christian. That is a mystery, says the man of science. Observe that the Christian's answer is finally reduced to this. If he says: "Man suffers, because his forefathers sinned," and you press him with "Why should the descendant pay for his forefather's folly?" he replies: "That is a mystery." "Well," I should reply to the Christian, "why did you not say at first, as I do, that if man suffers in this world, apparently without deserving it, that is a mystery? Don't you see that your explanation is like the Chinese explanation of the suspension of the earth in mid air? 'Chinaman, what carries the earth?' 'A great elephant.' 'And what carries the elephant?' 'A tortoise.' 'And what carries the tortoise?' 'I don't know.'" Ah, my friend, drop the elephant and the tortoise and admit your ignorance.

In the above instance Diderot had described the elephant and tortoise theory to a "Chinois"; in the *Letter on the Blind* he reverted to the original "Indian."]]

[*Note 4.*—We are . . . to consider concerning perception, that the ideas we receive by sensation are often in grown people altered by the judgment, without our taking notice of it. When we set before our eyes a round globe, or any uniform colour—*e.g.* gold, alabaster, or jet,—'tis certain that the idea thereby imprinted in our mind is of a flat circle variously shadowed, with several degrees of light and brightness coming to our eyes. But we have by use been accustomed to perceive what kind of appearance convex bodies are wont to make on us; what alterations are made in the reflections of light, by the difference of the sensible figures of bodies; the judgment presently, by an habitual custom, alters the appearances into their causes, so that from that, which truly is variety of shadow or colour, collecting the figure, it makes it pass for a mark of figure, and frames to itself the perception of a convex figure, and an uniform colour; when the idea we receive from thence is only a plane variously coloured; as is evident in painting. To which purpose I shall here insert a problem of that very ingenious and studious promoter of real knowledge, the learned and worthy *Mr Molineux*, which he was pleased to send me in a letter some months since, and it is this :

“Suppose a man born blind, and now adult, and taught by his touch to distinguish between a cube and a sphere of the same metal and nighly of the same bigness, so as to tell, when he felt one and t’other, which is the cube, which is the sphere. Suppose then the cube and sphere placed on a table, and the blind man to be made to see: *Quære*, whether by his sight before he touched them, he could now distinguish, and tell, which is the globe, which is the cube. To which the acute and judicious proposer answers, *Not*. For though he has obtained the experience of how a globe, how a cube affects his touch, yet he has not yet attained the experience, that what affects his touch so or so, must affect his sight so or so. Or that a protuberant angle in the cube, that pressed his hand unequally, shall appear to his eye as it does in the cube. I agree with the thinking gentleman whom I am proud to call my friend, in his answer to this his problem; and am of opinion, that the blind man, at first sight, would not be able with certainty to say, which was the globe, which was the cube, whilst he only saw them; though he could unerringly name them by his touch, and certainly distinguish them by the difference of their figures felt.”—*An Essay concerning Human Understanding*, vol. i, pp. 107, 108 (ed. 1721).]

[*Note 5*.—*Condillac*, Étienne Bonnot de (1715–1780), a French philosopher, was born at Grenoble, and took orders and became the Abbé de Mureau. The profession was nominal, and Condillac’s whole

life was devoted to speculation. His works are : an *Essay on the Origin of Human Knowledge* (1746), the *Treatise on Systems* (1798), *Treatise on Sensations* (1767-1773), in fifteen volumes, and two post-humous works—*Logic* (1781), and the *Language of Calculation* (1798). In his earlier days in Paris he came much into contact with the circle of Diderot. He spent his later years in retirement at a property he had bought near Beaugency, and died there on August 3rd, 1780. Condillac is important as a psychologist, and as having established systematically in France the principles of Locke, whom Voltaire had lately made fashionable. In his *Treatise on Sensations* he questions Locke's doctrine that the senses give us an intuitive knowledge of objects, and that the eye judges naturally of shapes, sizes, positions, and distances.

The plan of Condillac's book is the idea of a statue organised like a man, with a soul which has never received an idea, into which no sense-impression has ever penetrated. He then treats of the senses one by one, beginning with smell. As an example of his careful and detailed treatment, the headings of some of the chapters may be quoted : "Of the Ideas of a Man limited to the Sense of Smell" ; "Of a Man limited to the Sense of Hearing" ; "Of Smell and Hearing Combined" ; "Of Taste by Itself, and of Taste Combined with Smell and Hearing" ; "Of a Man limited to the Sense of Sight." In the second section of the treatise the statue is invested with the sense of touch which first informs

him of the existence of external objects. "Apart from any definite propositions, Condillac did a notable work in the direction of making psychology a science: it is a great step from the desultory, general observation of Locke to the rigorous analysis of Condillac, short-sighted and defective as that analysis may seem to us in the light of fuller knowledge."¹]

[*Note 6.*—William Cheselden (1688–1752), a well-known surgeon and anatomist. In 1728 he wrote a paper (*Phil. Trans.*, xxxv, 447) entitled "An account of some observations made by a young gentleman who was born blind . . . and was couch'd between thirteen and fourteen years of age." The account of this youth's experience is clear and masterly, but brief, and most students have regretted that the opportunity was not seized for more detailed observations. See also Voltaire, *Elémens de la philosophie de Newton*, pt. ii, ch. vii (*Œuvres complètes*, ed. Beuchot, t. i, 1879, pp. 469, 470), where Voltaire summarises the case.]

¹ Art. "Condillac," *Encyclopædia Britannica*, vol. vi, pp. 849–851 (11th edition).