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12 Pascal and philosophical method

The idea of a philosophical method is more commonly associated with Descartes than it is with Pascal. In his *Discourse on the Method for Conducting One's Reason Well and for Seeking Truth in the Sciences*, first published in 1637, Descartes asserts that, in order to be successful, the search for philosophical and scientific truths has to obey a fixed set of guidelines. In contrast, Pascal generally uses the term *method* ironically and pejoratively. In the *Provincial Letters* the various techniques used by the Jesuits to twist the precepts of conventional morality are often referred to as a *method*.[1] In the *Pensées*, the word *method* is almost entirely absent. There exists one work, however, where Pascal uses the term in a non-pejorative way: a small, unfinished treatise written around 1655 and entitled *Mathematical Mind* (*De l'esprit géométrique*). In a bold claim reminiscent of Descartes' *Discourse on Method*, Pascal presents the treatise as 'the method for mathematical [i.e., methodical and perfect] demonstrations' (*OC* 11, 155). More generally, he presents mathematical reasoning as the model that one should emulate in every intellectual activity. A study of Pascal's philosophical method must thus begin with an analysis of *Mathematical Mind*.

THE EXAMPLE OF MATHEMATICS

The method presented in *Mathematical Mind* is not aimed at *discovering* scientific or philosophical truths. According to Pascal, there are 'three principal objects in the study of truth: first, to discover it when one is searching for it; second, to demonstrate it when one possesses it; third, to distinguish it from untruth when one examines it' (*OC* 11, 154). Pascal goes on to say that his treatise does not

address the first object (the art of finding truths that were previously unknown) because the issue has been addressed extensively and excellently by others (a probable allusion to Descartes' *Discourse on Method*, or to the work of François Viète, who developed rules for the discovery of truths through *analysis*). The treatise addresses the second object (how to demonstrate truth when one possesses it) and the third by implication (because the rules one uses for demonstrating true propositions can also be applied to distinguish them from false ones). In short, the purpose of the treatise is 'to demonstrate those truths that are already known, and to shed light on them in such a way that they will be proven irrefutably' (*OC* II, 154).

The beginning of the treatise contains some sweeping claims. Pascal argues that mathematics provides the one and only method for conducting perfect demonstrations: 'Only this science', he says, 'possesses the true rules of reasoning', because 'it is based on the true method for conducting one's reason in all things'. Pascal adds that mathematics teaches this method only by example, and that 'it produces no discourse about it' (*OC* II, 154). In other words, mathematicians practise the perfect method for demonstrations, but no mathematician has ever stated what the rules of this method are. As a result, this method is 'unknown to almost everyone' (*OC* II, 155). The purpose of the treatise is, therefore, to explicate these rules in order to make them applicable beyond mathematics to the entire universe of intellectual activity. Whoever possesses this method, Pascal claims, will have an edge over his interlocutors, 'because we can see that in contests between minds that are equally strong in all other respects, the mathematical one wins' (*OC* II, 155).

For Pascal, mathematics is the only human science capable of producing flawless demonstrations, 'because it is the only one to follow the true method', while all other sciences, 'due to their very nature have some degree of confusion' (*OC* II, 155). Before sharing the rules of the true method with his reader, Pascal embarks on a digression. He mentions another method that is 'even loftier and more accomplished' (*OC* II, 155) than the method of mathematics. It is, however, out of reach for human beings, 'because what is beyond mathematics is beyond us' (*OC* II, 155). This most excellent method comprises only two rules. First, one must define every term (give a clear explanation of every term used in the demonstration). Second, one must prove every proposition (in other words, back up every

single proposition with truths that are already known). According to Pascal, 'this would be a truly beautiful method, but it is an entirely impossible one' (*OC* II, 157), because the need to define all terms would lead to infinite regress. As always in Pascal, the digression is a way of driving home an essential point: in order to ascertain what the perfect method is, let us assume what it would be in theory. In theory, one should define everything and prove everything, but anyone who tries to implement this method will keep defining terms *ad infinitum*. Pascal's point is that the problem does not lie with the method itself; it lies with the limitations of the human mind. The fact that the perfect method leads to infinite regress proves that 'men are naturally and permanently unable to practise any science whatsoever in an absolutely perfect order' (*OC* II, 157).

Nevertheless, this does not mean that no order whatsoever is possible. The order of mathematics is available. For Pascal, the virtue of mathematics is that it is perfectly suited to both the strengths and the limitations of the human mind:

> This order, the most perfect among men, does not consist in defining or demonstrating everything, nor does it consist in defining or demonstrating nothing; rather it holds the middle ground: it does not define those things that are clear and well understood by all men, and it defines everything else; it does not prove those things that are known to all men, and it proves everything else. (*OC* II, 157)

The method of mathematics is exemplary because it occupies the middle ground between a more perfect method that is beyond the reach of the human mind, and an absence of method that underestimates our intellectual capacities. One must add that, for Pascal, the order of mathematics is inferior to the more perfect method described above 'only because it is less persuasive, not because it is less certain' (*OC* II, 157). Pascal makes it clear from the beginning of *Mathematical Mind* that he does not concern himself with the method for discovering truths that are previously unknown. In this treatise, certainty is a given. The focus is on persuasion.

KNOWLEDGE OF FIRST PRINCIPLES

In the practice of mathematics, what saves us from infinite regress is the fact that we arrive at 'primitive terms that can no longer be defined, as well as principles so clear that no clearer principles are

available to prove them' (*OC* 11, 157). Mathematicians do not define such primitive terms as *space*, *number*, *movement* or *equality*. Similarly, says Pascal, physicists should not try to define terms such as *time*, and philosophers would be well advised to abstain from defining *man* and *being*. Attempting to define such terms, which are perfectly clear and understandable to all, would only bring more confusion. In that sense, the true method consists in avoiding two opposite errors: trying to define everything, and neglecting to define those things that are not self-evident.

One might be surprised that mathematics is incapable of defining its principal objects of study (*number*, *movement*, *space*), but, Pascal argues, 'the lack of definition is a perfection rather than a shortcoming; it comes not from obscurity but from complete self-evidence' (*OC* 11, 162). This self-evidence is such that, 'even though it lacks the persuasiveness of demonstration, it has the exact same degree of certainty as demonstration' (*OC* 11, 162). A primitive term cannot be defined because nothing clearer than the term itself is available to explain it. In that sense, primitive terms and first principles are 'clear and certain by the light of nature' (*OC* 11, 157). The order of mathematics is, therefore, 'perfectly true, supported as it is by nature rather than discourse' (*OC* 11, 157).

Pascal's reflection on the relationship between demonstration and first principles is in many ways consistent with the Aristotelian tradition. In the *Posterior Analytics* Aristotle argues that 'not all knowledge is demonstrative' and that 'the knowledge of first principles is not by demonstration', because 'it is necessary to know the principles from which the demonstration proceeds, and if the regress ends with the first principles, the latter must be indemonstrable'.[2] Aristotle draws a clear distinction between scientific knowledge and the knowledge of first principles. Scientific knowledge is the province of discursive reasoning. The first principles, however, 'must be apprehended by Intuition'.[3] For Aristotle, wisdom is a combination of discursive reasoning and intuition: 'The wise man therefore must not only know the conclusions that follow from his first principles, but also have a true conception of those principles themselves. Hence Wisdom must be a combination of Intuition [*nous*] and Scientific Knowledge [*episteme*]'.[4]

Pascal does not appropriate the Aristotelian tradition without submitting it to a major reinterpretation. In Aristotle, it is implied that not all minds have a sound intuition of first principles, because these

principles must be reached by laborious induction: 'Induction supplies a first principle or universal, deduction works *from* universals; therefore there are first principles from which deduction starts, which cannot be proven by deduction [*syllogismos*]; therefore they are reached by induction [*epagoge*].'[5] In Pascal, on the other hand, the knowledge of first principles is given by nature and is readily available to all. Pascal also differs from Aristotle in his characterisation of the faculty that allows us to grasp first principles. The Greek term Aristotle uses to designate this faculty is *nous* (usually translated as intuition, rational intuition, or intelligence). For Pascal, the faculty that allows us to grasp the first principles is *le cœur* (the heart):

> For knowledge of first principles, like space, time, motion, number, is as solid as any derived through reason, and it is on such knowledge, coming from the heart and instinct, that reason has to depend and base all its arguments. The heart feels that there are three spatial dimensions and that there is an infinite series of numbers, and reason goes on to demonstrate that there are no two square numbers of which one is double the other. Principles are felt, propositions proved, and both with certainty though by different means. (L 110/S 142)

In Pascal's psychology the organ that allows us to experience feelings and emotions is the same organ that makes the knowledge of first principles possible. There are thus two paths towards knowing truth: one is rational knowledge, which is discursive and is located in the mind; the other is through the heart: it is intuitive and immediate. Both are equally valid and certain. One must add that these two forms of knowledge, far from being mutually exclusive, are complementary: the mind cannot reason without previous knowledge of the first principles; the heart is incapable of deducing the consequences of the first principles.

DEMONSTRATION AND PERSUASION

Mathematical Mind is a somewhat disconcerting treatise for a modern reader. It is divided in two sections. The first section is entitled 'Reflections on Mathematics in General'. The title of the second section is 'The Art of Persuasion'. These two titles (added by the early editors of the text) might lead the reader into thinking that the first section is about mathematics, while the second section is

about rhetoric. For a modern reader, mathematics and rhetoric are entirely alien to each other. Mathematics is the domain of certainty and true demonstration, while rhetoric is the province of uncertainty and emotion. Most modern readers would also tend to make a broad distinction between 'scientific' discourse (which would include the more rigorous forms of philosophical reasoning) and 'non-scientific' discourse (which would involve feelings and emotions, and would consequently have less rigour). In that perspective, there is no room for rhetoric or persuasion in scientific discourse, and non-scientific discourse is entirely alien to the method of mathematics. We are therefore tempted to read the first part of Pascal's treatise as a reflection on scientific discourse, and the second section as an analysis of non-scientific discourse. In fact, as Jean Mesnard has shown, the second section is simply a later draft of the first.[6] Both sections are about mathematics *and* persuasion. As I have shown above, at the beginning of the treatise Pascal states that his purpose is to show how to communicate truths that are already known. In that sense, the purpose of the whole treatise is indeed persuasion, and the method of mathematics is chosen because it is the best way of persuading an interlocutor not only within the field of mathematics itself, but in the entire sphere of intellectual activity.

In the second section of the treatise Pascal refines and complicates the argument he has made in the first. He states that persuasion can be accomplished in two different ways:

> Everyone knows that there are two paths to the acceptance of opinions by the soul: reason and will. The more natural path is reason, because one should only assent to demonstrated truths; the more ordinary one, however, is the will: men almost always form beliefs not because of proof but because of pleasure. (*OC* II, 171)

The crucial distinction here is between reason and the will (*la volonté*). The term *will* should not be understood in its modern sense. It does not refer to our capacity to make choices or act against our inclinations. It refers to the inclinations themselves. It is the desire, the wish, the disposition to do something. For Pascal, the mind has its first principles. The will has its own first principles too. The first principles of the mind 'are truths that are natural and known to everyone' (*OC* II, 172) (e.g., the whole is greater than its part). The first principles of the will 'are certain desires that are

natural and common to all men like the desire to be happy, which it is impossible not to have, in addition to several specific objects that everyone pursues in order to achieve that end' (*OC* II, 172).

Because 'there are two paths to the acceptance of opinions by the soul' (reason and will), these paths can be combined in four different ways, depending on the nature of the things that are conveyed in the process of persuasion. In the first scenario the things one wants to convey are a direct consequence of the first principles of reason. Persuasion will be successful if the connection to the first principles is shown clearly. In the second scenario the things one wants to convey are a direct consequence of the first principles of pleasure. Persuasion will be successful 'if one shows the soul that something can lead it to what it loves the most' (*OC* II, 172). The third scenario is a combination of the first two. When the things one wants to convey are a direct consequence of the first principles of reason *and* pleasure, persuasion will be the most successful, human nature being what it is. The fourth scenario is problematic. When there is a conflict between the first principles of reason and the first principles of pleasure, the outcome is uncertain: 'Hence an uncertain vacillation between truth and pleasure. Knowledge of the former and experience of the latter are in a struggle without a clear outcome. To assess it would require knowing what happens in the inner recesses of man, where man himself hardly ever goes' (*OC* II, 173).

After examining these four scenarios Pascal draws a general conclusion that is applicable to all cases of persuasion:

> Therefore, whatever the object of persuasion may be, we must pay attention to our interlocutor, we must know his mind and heart, what principles he grants, what things he likes; we must then point to the object in question in order to show its connections to the principles that have been granted or to the objects of pleasure. (*OC* II, 173)

Hence, says Pascal, 'the art of persuasion consists in pleasing as much as in convincing', because 'men are governed by whim more than reason' (*OC* II, 173). In a way, this conclusion only restates a general principle of rhetoric, known as *decorum*: the need to tailor one's speech to the needs, preferences, opinions and expectations of the audience. Pascal, however, clarifies and simplifies the concept of decorum. Here, paying attention to the interlocutor means paying attention only to the first principles of his mind and the first principles

of his heart: 'what principles he grants, what things he likes'. Once this has been done adequately, persuasion is easy. It suffices to follow the two rules enunciated above: define every term (except primitive terms) and prove every proposition by showing its connection to the first principles.

These few rules and concepts form a general theory of persuasion. They are Pascal's philosophical method. What is most remarkable to a modern reader is that the model of mathematics applies to both the mind and the heart. Whether they belong to the mind or the heart, principles are still principles, and their consequences are demonstrated in the same way.

This is what leads Pascal to assert that 'the art of pleasing has rules that are just as reliable as the art of demonstrating' (*OC* II, 174). In addition, 'he who would have perfect knowledge of these rules would succeed in making himself loved by kings and others, just as reliably as someone would succeed in demonstrating mathematical truths' (*OC* II, 174).

This is only half of the truth, however. Compared to the art of demonstrating, the art of pleasing is 'more difficult, more subtle, more useful, and more wonderful' (*OC* II, 173). That is not because the *method* of the art of pleasing is more complicated. As above has shown, Pascal insists that it is the same in both arts. The art of pleasing is more difficult because its principles are ever-changing:

> The reason for this extreme difficulty is that the principles of pleasure are neither firm nor stable. They vary from person to person, and within an individual as well, so much so that there is nothing so different from a man than this man himself over time. A man has other pleasures than a woman, a rich person and a poor person have dissimilar pleasures; a prince, a soldier, a merchant, a burgher, a peasant, the old, the young, the healthy, the sick, are all different; the slightest incidents change them. (*OC* II, 174)

In mathematics the number of first principles is relatively small and the principles themselves do not change. Deriving the consequences from the first principles is, therefore, not very difficult, provided that the proper method is followed. In the art of pleasing the difficulty consists in the fact that the first principles are countless and subject to change. Therefore it takes an extraordinary perceptiveness and an unusually sharp knowledge of the human heart to master the art of pleasing.

NATURE, CUSTOM AND FIRST PRINCIPLES

As I have shown above, Pascal presents the first principles of the mind as simple and easy to grasp by the light of nature. Yet he makes several remarks, both in *Mathematical Mind* and in the *Pensées*, that tend to complicate this picture: the natural knowledge of first principles is neither perfect nor universal. For instance, in *Mathematical Mind* Pascal remarks that some people 'are incapable of seeing that space can be divided *ad infinitum*' (*OC* II, 164). The infinite divisibility of space is one of the first principles of geometry. Not being able to grasp this first principle makes one incapable of practising this science. For Pascal, this shortcoming is akin to a physical disability. Indeed, when Pascal identifies the heart as the organ that perceives the first principles, he means that there is something inherently bodily and physical about this perception. We reason with our soul, but our knowledge of first principles comes from our body: 'Our soul is cast into the body where it finds number, time, dimensions; it reasons about these things and calls them natural, or necessary, and can believe nothing else' (L 418/S 680).

Another way of expressing the same thought is to say that what makes a first principle first is nothing but the physical limitations of our intuition. In the fragment entitled 'Disproportion of Man' Pascal remarks that scientific knowledge deals with two infinities. It is clear that science studies an infinite number of *objects*, but it is also true that the number of scientific *principles* is infinite as well:

> Thus we see that all the sciences are infinite in the range of their researches, for who can doubt that mathematics, for instance, has an infinity of infinities of propositions to expound? They are infinite also in the multiplicity and subtlety of their principles, for anyone can see that those which are supposed to be ultimate do not stand by themselves, but depend on others, which depend on others again, and thus never allow any finality. (L 199/S 230)

For Pascal, looking into the first principles of science is like looking into the infinitely small. However small and minute a principle might be, it can still be analysed into smaller and smaller principles. A principle is to science what an indivisible point is to a line: 'But we treat as ultimate those which seem so to our reason, as in material things we call a point indivisible when our senses can perceive nothing beyond it, although by its nature it is infinitely divisible'

(L 199/S 230). In other words, what makes a point look indivisible is the limit in the power of resolution that is natural to the human eye. Similarly, first principles look like first principles to us only because our minds are not sharp enough. From this, Pascal concludes that writing a book about the first principles of science is just as presumptuous as writing a book about *everything*:

> Of these two infinites of science, that of greatness is much more obvious, and that is why it has occurred to few people to claim that they know everything. 'I am going to speak about everything', Democritus used to say.
>
> But the infinitely small is much harder to see. The philosophers have much more readily claimed to have reached it, and that is where they have all tripped up. This is the origin of such familiar titles as *Of the Principles of Things, Of the Principles of Philosophy*, and the like, which are really as pretentious, though they do not look it, as this blatant one: *Of All That Can Be Known*. (L 199/S 230)

Pascal does not only argue that our knowledge of first principles is defined by the natural limitations of our bodies. He also takes into account the fact that our bodies themselves are shaped by custom. Societal norms and beliefs determine the way we feel and perceive things in the most basic and profound fashion (i.e., before any rational or explicit understanding of these matters). All these norms and beliefs are registered, as it were, in our bodies, in ways that we cannot see, let alone change. In that sense, says Pascal, 'custom is our nature' (L 419/S 680). Therefore, for Pascal, the critique of custom (a familiar theme borrowed from Montaigne) applies not only to societal norms and beliefs, but also to the first principles of mathematics:

> Custom is our nature. Anyone who grows accustomed to faith believes it, and can no longer help fearing hell, and believes nothing else.
>
> Anyone accustomed to believe that the king is to be feared . . .
>
> Who then can doubt that our soul, being accustomed to see number, space, movement, believes in this and nothing else? (L 419/S 680)

Let me summarise Pascal's reasoning. Knowledge of the first principles comes from the body. The body is shaped by custom. Custom is, by definition, variable. Our knowledge is, therefore, based on the shakiest foundations. Pascal gives several examples of this fact. For instance, the force of custom makes us unwilling to give up familiar explanations of natural phenomena, even after these explanations

have been discredited by new discoveries. Hence the resistance to the new theories regarding blood circulation: 'When we are accustomed to use the wrong reasons to prove natural phenomena, we are no longer ready to accept the right ones when they are discovered. The example given concerned the circulation of the blood, to explain why the vein swells below the ligature' (L 736/S 617). From a slightly different point of view, Pascal also argues that, because our grasp of first principles is determined by habit and custom, it is influenced by the company we keep:

> Our minds [*esprit*] and feelings [*sentiments*] are trained by the company we keep, and perverted by the company we keep. Thus good or bad company trains and perverts respectively. It is therefore very important to be able to make the right choice so that we train rather than pervert. And we cannot make this choice unless it is already trained and not perverted. This is thus a vicious circle from which anyone is lucky to escape. (L 814/S 658)

In addition, Pascal remarks, there is a constant interaction between 'feeling' [*sentiment*] and reason: 'Memory and joy are feelings [*sentiments*], and even mathematical propositions can become feelings, for reason makes feelings natural and natural feelings are eradicated by reason' (L 646/S 531). In other words, habitual reasoning can turn some propositions into principles that have the same status as the first principles we know by the light of nature. Conversely, critical reasoning can demote some first principles and make them appear conventional or artificial, instead of obvious and natural.

Fundamentally, the difficulty comes from the fact that, in Pascal's psychology, the heart, which allows us to grasp the first principles, is also the organ of whim, fancy and passion. Because reason depends upon the heart for knowledge of first principles, it is fair to say that 'all our reasoning comes down to surrendering to feeling (*sentiment*)' (L 530/S 455). By the word *sentiment*, Pascal means a highly personal, yet non-relativistic, perception of the first principles.[7] However, because *sentiment* is located in the heart, it is very hard to distinguish from individual fantasy: 'One person says that my feeling is mere fancy, another that his fancy is feeling' (L 530/S 455). How does one distinguish fancy from feeling? 'Reason is available', Pascal replies, 'but can be bent in any direction. And so there is no rule' (L 530/S 455).

ORDER OF THE MIND VS. ORDER OF THE HEART

In the *Pensées* a significant number of fragments discuss the possible structure and presentation of the apology of the Christian religion that Pascal intends to write. The word Pascal uses to refer to this issue is *order*, and the question that nags him is: what is the proper order? For instance, he asks: '*Order*. Why should I choose to divide my ethics into four rather than six? Why should I define virtue as four, or two, or one?' (L 683/S 562). To a modern reader, the question of order will probably seem important but not essential. It has to do with form rather than content. For Pascal, on the contrary, the question of order is an essential one. This will appear quite clearly if we look back at the work discussed at the beginning of this chapter, *Mathematical Mind*. In this treatise Pascal discusses mathematics as the 'true method' for performing demonstrations of things that are already known. After a digression stating that 'men are naturally and permanently unable to practise any science in an absolutely perfect order', Pascal claims that 'the order of mathematics is available' (*OC* II, 157). The order of mathematics is imperfect with respect to an absolute standard. It is perfect with respect to human standards. In that sense it is the 'true method'. In this treatise, Pascal uses the words *method* and *order* as synonyms. In that sense inquiring about Pascal's philosophical method is the same as inquiring about his reflections on *order*. As above has shown, in *Mathematical Mind*, Pascal's reflections on mathematics cannot be separated from his reflections on rhetoric and persuasion. Mathematics provides the order, or method, that will make persuasion possible. In other words, the central question for Pascal is: in what order should I put my thoughts and arguments, given the fact that my goal is to persuade my interlocutor?

Because of a spontaneous tendency we have to separate form from content, we may have difficulty grasping how essential the question of *order* or *method* is for Pascal. For us, considerations of method are preliminary or formal in nature. For Pascal, following the proper method is essential, because only the proper method can persuade an interlocutor, and the only purpose in discussing truths is to share them with an interlocutor.

Pascal's praise for the method of mathematics has paradoxical implications. It is necessary to understand the method of mathematics

in order to understand how persuasion works. Yet at the same time one must realise that the method of mathematics is rhetorically ineffective. Mathematics shows us what the perfect method is, but this method is inapplicable beyond the field of mathematics itself:

> *Order*. I could easily have treated this discourse in this kind of order: show the vanity of all kinds of conditions, show the vanity of ordinary lives, then the vanity of philosophers' lives, whether sceptical or Stoic, but the order would not have been kept. I know something about it and how few people understand it. No human science can keep it. St Thomas did not keep it. Mathematics keeps it, but it goes so far as to be useless. (L 694/S 573)

This order that 'few people understand' is the demonstrative order of mathematics. For Pascal, the central question of philosophy is the understanding of human nature. The countless number of principles involved in the study of human nature makes it impossible to explain with the method of mathematics. And mathematics itself is useless because its object is not human nature.

According to Pascal, the method of mathematics is doubly inadequate. On the one hand, an author who tries to mirror the nature of the thing he discusses will not be able to follow the method of mathematics. On the other hand, an author who tries to follow a demonstrative order will soon lose his reader:

> Discuss those who have dealt with self-knowledge; Charron's depressing and tedious divisions; Montaigne's muddle; the fact that he certainly felt the defects of a rigid method; that he avoided them by jumping from one subject to another; that he wanted to cut a good figure. (L 780/S 644)

For a persuasive description of human nature, Montaigne's disorder is preferable to the order of his disciple, Charron, who tried to present Montaigne's philosophy in neatly arranged but ultimately boring chapters and subchapters. In that sense, Montaigne's 'muddle' is a genuine literary model.[8] This disorder is an order of a different kind, which can also be found in Pascal's ultimate literary model, the Bible:

> *Order*. Against the objection that there is no order in Scripture.
>
> The heart has its order, the mind has its own, which uses principles and demonstrations. The heart has a different one. We do not prove that we ought to be loved by setting out in order the causes of love; that would be absurd.

Jesus Christ and St Paul possess the order of charity, not of the mind, for they wished to fire up, not to teach.

The same with St Augustine. This order consists mainly in digressions upon each point which relates to the end, so that this shall be kept always in sight. (L 298/S 329)

As I have shown, in *Mathematical Mind* 'there are two paths to the acceptance of opinions by the soul: reason and the will' (*OC* 11, 171). In the *Pensées* Pascal explains that

The will is one of the chief organs of belief, not because it creates belief, but because things are true or false according to the aspect by which we judge them. When the will likes one aspect more than another, it deflects the mind from considering the qualities of the one it does not care to see. Thus the mind, keeping in step with the will, remains looking at the aspect preferred by the will and so judges by what it sees there. (L 539/S 458)

The perfect rhetoric, or the true method, must speak to the heart and the mind at the same time. It must satisfy the mind by following the two rules mentioned in *Mathematical Mind*: define all terms (except primitive terms) and connect all propositions to the first principles. However, connecting a proposition to a first principle can be done in two different ways. It can be done step by step, in accordance with the mathematical method. It can also be done directly, when the desire to enjoy a truth leads the mind to contemplate one aspect of the object at hand that is directly connected to the first principles. That is St Augustine's (and Pascal's) digressive method: showing in a few words how a point that had apparently nothing to do with it is related to charity or the salvation of the soul. For instance, in the fragment entitled 'Disproportion of Man', after a long, step-by-step analysis of the double infinity of the universe, Pascal asks abruptly: 'Who can follow these astonishing processes?' He replies: 'The author of these wonders understands them: no one else can' (L 199/S 230). The allusion to God is out of step with the logic of the demonstration. Yet it is perfectly consistent with the 'order of the heart' and with the overall purpose of the fragment, which is to fill the reader with awe and confusion in order to kindle a desire for a more profound knowledge of causes. This 'order of the heart' is possible only because it is driven by 'certain desires that are natural and common to all men, like the desire to be happy' (*OC* 11, 172).

SCEPTICISM AND BEYOND

The first part of *Mathematical Mind*, as shown above, deals extensively with our ability (or inability) to comprehend the infinitely small. It ends with the following remark, suggesting that the real purpose of the treatise may be moral rather than epistemological:

> But those who will see these truths clearly will also marvel at the greatness and power of nature in this double infinity that surrounds us; thanks to this wonderful contemplation they will learn to know themselves; they will see themselves as placed between infinite extension and zero extension, between an infinite number and zero, between infinite movement and zero movement, between infinite time and zero time. This will allow us to evaluate ourselves correctly, and to produce reflections that are worth more than everything else in mathematics. (*OC* II, 170)

This passage contains the essence of the argument that Pascal developed several years later in the fragment of the *Pensées* entitled 'Disproportion of Man'. Knowing man's true place in the universe is a humbling thought. An epistemological reflection on infinity turns into a reflection on self-knowledge.

Similarly, Pascal's seemingly inconclusive discussion of our knowledge of first principles has a purpose beyond the discussion itself. Pascal argues in some places that we have a natural, immediate and true perception of first principles. In other places he seems to argue the opposite, by showing that nature is shaped by custom and so forth. His discussion of our knowledge of first principles follows the method of sceptical philosophy: an argument is always followed by a counter-argument.

This sceptical approach is especially visible in Pascal's discussion of our knowledge of time and space. In *Mathematical Mind* Pascal argues on the one hand that it is not necessary to define the word *time* because when I utter this word, everybody knows what I am talking about. On the other hand, he says, this does not necessarily mean that we all have the same idea of what time is:

> There are many differences of opinion regarding the nature of time. Some say it is the movement of created things; others that it is the measure of movement, etc. Thus I am not saying that there is common knowledge of the nature of these things; only the relationship between word and thing; so that when the word *time* is uttered, all direct their minds towards the same object. This suffices to make it unnecessary to define the term, even though

the differences of opinion regarding the nature of time will emerge once our minds are applied to it. (*OC* 11, 159)

The word *time* points to an object that everyone recognises, but whose nature remains unknown. In the *Pensées* Pascal carries these reflections further in fragment L 109/S 141, entitled 'Against Scepticism'. The fragment starts with the familiar claim that it is unnecessary to define primitive terms, 'because we cannot define these things without making them obscure'. Pascal goes on to say that 'we have no proof' that everyone has the same conception or mental image of such primitive terms as *time*, *space* or *movement*. The only thing we know is that 'we apply these words on the same occasions; every time two men see a body change its position they both use the same word to express what they have seen, each of them saying that the body has moved'. In other words, the meaning of a word resides entirely in its usage. But precisely, Pascal adds, the regularity in the usage of the word makes one suspect that there is perhaps a conception of *movement* that we all share: 'Such conformity of application provides a strong presumption of conformity of thought.' However, 'it lacks the absolute force of total conviction, although the odds are that it is so, because we know that the same conclusions are often drawn from different assumptions'. The conclusion is awkwardly sceptical and anti-sceptical at the same time:

> That is enough to cloud the issue, to say the least, though it does not completely extinguish the natural light which provides us with certainty in such matters. The Academics would have wagered on it, but that makes the light dimmer and upsets the dogmatist, to the glory of the sceptical clique which stands for ambiguous ambiguity, and a certain dubious obscurity from which our doubts cannot remove every bit of light any more than our natural light can dispel all the darkness. (L 109/S 141)

This 'ambiguous ambiguity' is exactly where Pascal wants to bring his reader. A thoroughly sceptical discussion of our knowledge of first principles ends with the conviction that there is something to the idea that we all have a natural and true intuition of those principles. That is why the fragment is entitled 'Against Scepticism'.

On one side, the 'dogmatists' (Plato, Descartes) believe in our natural ability to grasp the nature of things. On the other hand, the sceptics (Pyrrho, Montaigne) use reason to question this natural ability. The conflict remains unresolved: 'We have an incapacity for proving

anything which no amount of dogmatism can overcome. We have an idea of truth which no amount of scepticism can overcome' (L 406/S 25).

The whole purpose of the discussion is to bring the reader into a state of confusion and anxiety, to make him feel that man is 'a monster that passes all understanding' (L 130/S 163). This anxiety, however, is meant to yield positive results. Even though the discussion is inconclusive on a cognitive level, it does have results from a moral point of view. Or rather, it is the very inconclusiveness of the discussion that makes it useful from a moral point of view:

> Know then, proud man, what a paradox you are to yourself. Be humble, impotent reason! Be silent, feeble nature! Learn that man infinitely transcends man, hear from your master your true condition, which is unknown to you. Listen to God. (L 131/S 164)

At this point there is a shift in Pascal's argument. The sceptical examination of our cognitive abilities gives way to dogmatic discourse. Pascal proposes the original sin narrative as the key to the enigma of human nature: 'We perceive an image of the truth, and possess nothing but falsehood, being equally incapable of absolute ignorance and certain knowledge; so obvious it is that we once enjoyed a degree of perfection from which we have unhappily fallen' (L 131/S 164).

This aspect of Pascal's argument is well known. What may be less well known is that Pascal suggests some practical ways of overcoming the limitations of our natural intuition of first principles. For instance, for those who have no natural intuition of infinite division, Pascal proposes to use a telescope to observe a point in the sky that looks very small to the naked eye. They will discover that this apparently indivisible point is in fact a huge chunk of space. It is thus conceivable that with an even better telescope this small point would seem as large as the firmament does to the naked eye, and so on (*OC* 11, 165–6). What Pascal proposes here is an *exercise*, based on the assumption that our grasp of first principles resides in the body, not in the mind. It is therefore essential to *experience* something similar to infinite divisibility in order to have an intuition of it. The fragment entitled 'Disproportion of Man' is a textual equivalent of this exercise. Pascal appeals to his reader's imagination, his emotions, his senses, in order to help him have an intuition of the double infinity of the universe. This is also why, after

expounding the wager argument (which is flawlessly demonstrative but fails to cause a change in the reader's behaviour) and instead of elaborating further on the demonstration, he proposes some practical steps that will alter the reader's fundamental preferences: 'taking holy water, having masses said, and so on' (L 418/S 680). The goal here is to help the reader put God rather than the objects of his passions as the first principle of his pleasure. This is why Pascal calls the wager argument 'le discours de la machine' (L 11/S 45). As he puts it elsewhere, 'we are as much automaton as mind' (L 812/S 660). Persuasion must therefore work on both the automaton and the mind:

> Demonstration is not the only instrument for convincing us. How few things can be demonstrated! Proofs only convince the mind; habit provides the strongest proofs and those that are most believed . . . Who ever proved that it will dawn tomorrow, and that we shall die? And what is more widely believed? It is then habit that convinces us and makes so many Christians . . . In short, we must resort to habit once the mind has seen where the truth lies, in order to steep and stain ourselves in that belief which constantly eludes us, for it is too much trouble to have the proofs always present before us. We must acquire an easier belief, which is that of habit.
>
> Reason works slowly, looking so often at so many principles, which must always be present . . . Feeling does not work like that, but works instantly, and is always ready. We must then put our faith in feeling, or it will always be vacillating. (L 814/S 658)

In the business of persuasion, demonstration is the easy part. The hard part consists in altering the interlocutor's perception of first principles. It can be done, however, because, as the sceptics have noticed, our perception of first principles is shaped by habit and custom. Ultimately, Pascal wants his interlocutor to adopt the habits and customs that will gradually change his perception of first principles. Pascal's philosophical method is a method for changing one's way of life.

NOTES

1. See, for instance, letter VII in *Provincial Letters*, translated by A. J. Krailsheimer (Harmondsworth: Penguin, 1967), p. 109.
2. Aristotle, *Posterior Analytics*, 1.iii, 75b20 (Cambridge, MA: Harvard University Press, 1960; translation modified).

3. Aristotle, *Nicomachean Ethics*, VI.vi, 2 (Cambridge, MA : Harvard University Press, 1934; translation modified).
4. *Nicomachean Ethics*, VI.vii, 3 (translation modified).
5. *Nicomachean Ethics*, VI.iii, 3.
6. Mesnard, *Oeuvres complètes*, III, 360–89.
7. On Pascal's *sentiment* in the sciences, see Jones 2001.
8. On the issue of order in Pascal and Montaigne, see Thirouin 1994.