

## LETTER XIX TO PASCAL

CHEVALIER DE MÉRÉ

### 1. INTRODUCTION

Antoine Gombaud, the Chevalier de Méré, was a man of letters and a gambler. This letter from him to Pascal bears no date. It may be found in *Lettres de Monsieur le Chevalier de Méré*, Première Partie. Paris, 1682. pp. 110-126

### 2. TEXT

[110] Do you yourself remember having said to me once that you were no longer so persuaded of the excellence of Mathematics? You [111] write to me at this hour that I have completely disabused you of it, and that I have revealed some things to you that you might have never seen if you had not known me. I do not know, however, Sir, if you are so obliged to me as you think. There remains to you yet a habit that you have taken in this Science, to judge whatever it be only by your demonstrations which most often are false. These long reasonings you draw from line to line prevent you from entering, first into some higher understandings which never deceive. I inform you also that you lose thence a great advantage in the world, for then as with quick mind, and acute eyes we remark on the look and the air of the persons so we see a quantity of things which are much able to serve, and if you demand according to your custom to the one who knows to profit from these sorts of observations on what principle they are based, perhaps he would say to you that he knew [112] nothing of them, & that these are some proofs only for him. You believe besides that in order to have the right mind & not make a false reasoning, so it suffices for you to follow your Figures without distancing yourself from them, & I swear to you that it is almost nothing more than this art of reasoning by the rules, of which the small minds & the semi-Scholars make so many cases. The most difficult & the most necessary for that depend on penetrating into what the things consist which present themselves, whether we want to oppose them or to compare them, or gather them, or separate them, & in the discourse to draw from them quite just consequences. Your numbers this Artificial reasoning do not make known that which the things are, it is necessary to study them by another way, but you remain always in errors where the false demonstrations of Geometry have cast you, & I will never believe you completely cured of Mathematics, [113] as long as you sustain that these small bodies, of which you disputed the other day, are able to be divided to infinity.

That which you write to me appears to me yet more remote from good sense than all that which you say to me in our dispute? And that you claim to conclude from this Line that you cut in two equally, from this Chimerical Line of which you cut again one of the halves, & always likewise to eternity? But who has said to you that you are able thus to divide this Line if that which composes it is unequal as an odd number. I learn from you that as soon as it enters ever so little of infinity into a question it becomes inexplicable, because the mind is troubled & confounded. So that we find in it better the truth by the natural sense than

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by your demonstrations. You allege to me that we are not able to figure a body so small that we give a circumference to it, a [114] right side, a left side, one in height, the other in the base, & that thus we see it always divisible? What do you wish to conclude thence? But what say you of the Globe when it turns on its center what remains immobile? is it something as this center, or nothing at all? If it is nothing your demonstrations are based on a Chimera, & you must not be sincere. But if it is I do not know in what manner, I have not more difficulty myself to represent this I know not what fills that void; & nonetheless it is necessary that I the indivisible figure, if I see that it is fixed & without movement when the Circle turns on its point from the center. I believe that the error where you are coming principally from that which the Geometers have not taken care that a thing is quite able to be material without being a body; For, we understand under this word of body a matter composed of many parts, so that the consequence is [115] good that these parts are able to be divided the ones from the others, but is this not to say that each part considered in itself is divisible? And to make this portion of matter which occupies only the center of the Globe, if it had some sides it would not be immobile when the Globe turns. But if you respond that there is only the space which remains fixed, & without movement in the middle of the Globe or of the Sphere, you propose only your first Masters who believe you to understand something by saying to you that they would have however nothing say to you, since by its nature the space of the place is found immovable, & that it remains eternally fixed in one same state, as the space of the times is never stopped.

You know, that I have discovered in Mathematics some things so rare that the most wise of the ancients have never spoken anything of them, & of which the better Mathematicians of Europe have been surprised; [116] You have written on my inventions, as well as Mr. Huygens, Mr. de Fermat, and so many others who have admired them. You must judge thence that I advise no person to despise this science; and, in order to speak true, it is able to serve, provided that one is not attach too much to it: for ordinarily that which one seeks so curiously appears useless to me, and the time that one gives would be able to be better employed. It seems to me also that the reasons that one finds in this science, if they are obscure or against sense in the least, must render the consequences that we draw from it quite suspect, especially, as I have said, when it is mixed with infinity. One of our Queens was pleased to make dispute on similar subjects where never we were agreed, as if the bird was more ancient than the egg, or the egg than the bird, & their Memoirs witness well that it was Scholarly, & that it was of the mind: but supposed that the bird not [117] be able to come without the egg, nor the egg without the bird, as one is able to decide which of the two is the first? Points & the moments are imperceptible, whatever it be has no quite distinct idea of them, & does not see them quite clearly; nevertheless one has not the ease to wish them to bring back the ones to the others in an extreme accuracy, & to discover quite punctually. We comprehend the points & moments only of that alone which are not divisible: And do you believe that a thing is known that by knowing only that which it is not? This ignorance makes loss of time by seeking so many false demonstrations, which reverse good sense as to prove by some consequences which seem true similar as two bodies are able always to approach without ever joining & so many others of this kind. But it is necessary to remember that good sense scarcely deceives, & that with the reservation of the [118] supernatural things all that which shocks it is false?

I do not imagine, you say, that anything of matter is indivisible; perhaps I do not imagine more than you, & I see however well that the consequence that you draw from it, that there is found an infinity of parts, is not correct. And that know you if it is not at all the fault of your imagination? or likewise the one of this small body, which for its smallness is not

able to come to the knowledge of sense? We do not conclude in the same way that all that which you are able to understand is only a dream? And do you understand well a thing that you are constrained to avow by your principles that a grain of gold would suffice to gild all money, all the brass, all the lead, all the iron, all the wood, & all the matter which is able to be gilded? Yes, you say to me, provided that this grain was well managed. But how to manage when it is necessary to make an infinite outlay? And next to what good to manage that which is not able to be depleted? It seems to me that as a great mind as yours must be above some Arts & some Sciences, quite far from being permitted to encroach, & to be slave to it.

I ask you again if you understand distinctly if in the one hundred thousandth part of a grain of poppy, it was able to have a World not only as the this one; but yet all those that Epicurus has dreamt! Are you able to understand in one so finite space the difference of magnitudes, that of the movements & of the distances? of how much the Sun is greater than this small animal which sometimes shines in the night, & how much the eager clarity of this great Star surmounts this feeble glow? Are you able to imagine in this small space by how much the Sun goes faster than Saturn, or if the Sun is immobile as some are persuaded of it. Could you be able to suppose neither you nor Archimedes in a place so tight, by how much the movement of the cannonball which exits from the cannon surpasses the pace of a tortoise? Will you find in a coin so narrow the true proportions of the lengthenings, by how much the Stars are above the earth to the price of the Moon? But without going so far, are you able to figure in this small World of your fashion the surface of the earth & of the sea, so much deep abyss in the one & in the other, so many mountains, so many valleys, so many fountains, creeks & streams, so many cultivated Country, so many crops which are collected, so many forests of which the ones are standing, & the others cut, so many cities, so many Workers of which the ones build, the others demolish: & some make the eyeglasses of approach which do not permit to serve among those small men, because their eyes, & all their senses are proportioned to this small World? What therefore all these voyages of long course, these great & these small vessels which make the tour of the World, & of which the ones [121] make so good sailboats that they dread not at all the Corsairs. This great number of combats on the earth & on the sea; the battle of Arbelles where the King of Persia was vanquished in the midst of two hundred thousand horsemen, & eight hundred thousand foot soldiers, without counting so many armed chariots. Consider also the battle of Pharsala where Caesar put Pompey into flight, & that which Augustus gave on the sea where so many vessels were burned & all the forces of the Levant dissipated. The battle of Lepente seems to me yet more considerable in this small World, because of the great noise of the Artillery & that terrible combat of the mice & the frogs that Homer has chanted with a tone so high. In truth, Sir, I do not believe that in your small World one was able to rank in a just proportion all that which is passed in the one here, & in an order so ruled & without embarrassment; on all in some cities so iron-shod one must well fear for the danger of the embarrassments, [122] to make some fires of joy, & to found some cannons & some bells. Think also that in this Universe of so small extent there will be found some Geometers of your sense who would make a World so small in price of their, that it is the one that you form by comparison with ours, & that these diminutions would have no end. I leave to you to draw the consequence. We know many things of which we must speak only doubtfully, as we know much of others except that we are able to decide: & among the persons that we practice, I do not find less inconvenient to not say that which we know only to affirm that which we do not know. We doubt if the Moon causes the flow and ebb of the Ocean; if it is the earth or the sky which turns, & if the plants that we name

sensitives have sentiment; But we assure that the snow blinds us, that the Sun clears us & overheats us, & that the mind & honesty are [123] above all.

For that which regards the subject of our dispute, I will say to you frankly that which I think; it seems to me therefore that all the material parts of which the World is composed are counted. Their Creator knows the number of them; they neither increase nor decrease, since nothing is able to be created nor be reduced to nothingness, at least according to the order of nature. Each small part that God sees in itself has its being apart; & this little body in order to subsist has only to make another body, for nothing subsists necessarily; & all the bodies would be nothing, since there is no point which is able to be separated. The corporeal World is composed of these small bodies which are of different nature: & although they are so small that they are nearly nothing, however to them well to consider these are the only ones of which the Being is real & necessary. For you compose them as a tree, a flower, or a fruit [124] subsisting only by chance & for a time, since these small parts which compose them, separate themselves as they collect themselves; so that according to their diverse nature more or less noble, & their proportion more or less just, we find that which is composed of them more or less perfect: & thence come for these sorts of things all that which we love & that we admire. Moreover you hope to know everything by force of study, I wish to say the natural World, in the simplicity that he has pleased to God of the creator. Because for the artificial World which depends on the institutions of men, you neglect it by comparison with the other, & I know you good grace in it. Also I take care that the people of this artificial World are not set in pain of the other, & then we speak of it to them it is a language which surprises them. But I caution you that beyond this natural World which falls under the understanding of sense, there is another invisible, & that [125] it is the one that you are able to attain in the highest science. Those who are informed only of the corporeal World, judge ordinarily quite bad, & always grossly, as Descartes that you appraise so much who knew the space of the lines only by the bodies which occupy them; nor the space of time as by the duration of each thing. For he supports that if we remove all the bodies which are between Paris & Madrid these two cities would be touching, & a strange thing that they would be touching without being approached; for they would be touching, says he, since there would be nothing which separates them, & would be touching without being approached, since they would make again in the same place. But without stopping myself with the conviction of this error, you know that it is in this invisible World & of one extended to infinity, that we are able to discover the reasons & the principles of things, the most hidden truths, the correctness, [126] the justness, the proportions, the true origins, & the perfect ideas of all that which we seek.