



## THE CORRESPONDENCE

AT 3:660<sup>1</sup>

ELISABETH TO DESCARTES  
ebrary

[The Hague] 6 May 1643

M. Descartes,

I learned, with much joy and regret, of the plan you had to see me a few days ago; I was touched equally by your charity in willing to share yourself with an ignorant and intractable person and by the bad luck that robbed me of such a profitable conversation. M. Palotti<sup>2</sup> greatly augmented this latter passion in going over with me the solutions you gave him to the obscurities contained in the physics of M. Regius.<sup>3</sup> I would have been better instructed

1. I provide the reader with the volume and page references from the Adam and Tannery edition of Descartes' *Oeuvres*. The page number indicates the beginning of the page.
2. Alphonse Pollot (1602–68), whom Elisabeth refers to as Palotti, was a gentleman-in-waiting to the prince of Orange. In his letter to Pollot of 6 October 1642, Descartes notes his happiness that Elisabeth has read and seems to approve of his *Meditations*, as well as his intention to visit The Hague to meet her (see *Oeuvres de Descartes*, ed. Charles Adam and Paul Tannery, 11 vols. [Paris: Cerf, 1897–1913; new ed., Paris: Vrin, 1964–7; reprint, Paris: Vrin, 1996, cited hereafter as AT] 3:577–78) This letter would seem to mark Descartes' attempt at this meeting. Pollot's relation to Descartes began in 1638 with an exchange, through Henricus Reneri, about Descartes' *Discourse on the Method*. Pollot, as suggested here, effected the introduction between Descartes and Elisabeth. He appears to have tutored Elisabeth in geometry (see Descartes to Elisabeth, November 1645) and often served as the courier of their correspondence (see Elisabeth's letter of 24 May 1645, below). Reneri (1593–1639), a French philosopher, was a professor of philosophy at the University of Utrecht.
3. Henri le Roy or Regius (1598–1679) was a Dutch physician who took up Descartes' physics and physiology and taught them as chair of medicine at the University of Utrecht, beginning in 1638. Elisabeth's remarks here suggest that she was tutored by Regius or at least read his *Physiologia sive cognitio sanitatis* (Utrecht: Roman, 1641). While at Utrecht, beginning in 1642, Regius was attacked as promulgator of Cartesian philosophy by Professor of Theology Voetius. He was supported by Descartes in these battles until 1646. At that time there was a public falling out between Descartes and Regius upon publication of Regius's *Fundamenta Physica*. Descartes' side of this dispute can be seen in the French preface to the *Principles* and the *Comments on a Certain Broadsheet*. One can see trouble ahead in their earlier 1641 correspondence: see

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ebrary

661 on these from your mouth, as I would have been on a question I proposed to that professor while he was in this town, and regarding which he redirected me to you so that I might receive a satisfactory answer. The shame of showing you so disordered a style prevented me, up until now, from asking you for this favor by letter.

But today M. Palotti has given me such assurance of your goodwill toward everyone, and in particular toward me, that I chased from my mind all considerations other than that of availing myself of it. So I ask you please to tell me how the soul of a human being (it being only a thinking substance) can determine the bodily spirits, in order to bring about voluntary actions. For it seems that all determination of movement happens through the impulsion of the thing moved, by the manner in which it is pushed by that which moves it, or else by the particular qualities and shape of the surface of the latter. Physical contact is required for the first two conditions, extension for the third. You entirely exclude the one [extension] from the notion you have of the soul, and the other [physical contact] appears to me incompatible with an immaterial thing.<sup>4</sup> This is why I ask you for a more precise definition of the soul than the one you give in your *Metaphysics*, that is to say, of its substance separate from its action, that is, from thought.<sup>5</sup> For even if we were to suppose them inseparable (which is however difficult to prove in the mother's womb and in great fainting spells) as are the attributes of God, we could, in considering them apart, acquire a more perfect idea of them.

662 Knowing that you are the best doctor for my soul, I expose to you quite freely the weaknesses of its speculations, and hope that in observing the Hippocratic oath,<sup>6</sup> you will supply me with remedies without making them public; such I beg of you to do, as well as to suffer the badgerings of

Your affectionate friend at your service,  
Elisabeth.

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Descartes to Regius, May 1641 (AT 3:371–72, *The Philosophical Writings of Descartes*, ed. John Cottingham, Robert Stoothoff, and Dugald Murdoch, and for vol. 3, Anthony Kenny, 3 vols. [Cambridge: Cambridge University Press, 1984–1991, cited hereafter as CSM or CSMK, respectively] 181–82), December 1641 (AT 3:454–55, CSMK 199), December 1641 (AT 3:460, CSMK 200–201), January 1642 (AT 3:491, CSMK 491–92).

4. For a clear statement of this claim, see the Sixth Meditation argument for the real distinction of mind and body (AT 7:78, CSM 2:54).

5. Elisabeth here seems to be referencing the discussion in the paragraph subsequent to that containing the real distinction argument (AT 7:78–80, CSM 2:54–55), wherein Descartes details the “faculties” of extended and intellectual substances.

6. While Foucher de Careil, following Cerselier's rendering of Descartes' response, has “serment de Harpocrates” here, AT change it to Hippocrates. AT's reasoning seems sound. Not only do they follow the manuscripts, but the Hippocratic oath would have been well known to both Descartes and Elisabeth. Fabricius alludes to it, and by 1643 his work had seen more than thirty editions, one even published in Leiden in 1643 with a commentary by Meibomius.

DESCARTES TO ELISABETH

AT 3:663

Egmond du Hoef, 21 May 1643

Madame,

The favor with which your Highness has honored me, in allowing me to receive her orders in writing, is greater than I would ever have dared to hope; and it is more consoling to my failings than what I had hoped for with passion, which was to receive them by mouth, had I been able to be admitted the honor of paying you reverence, and of offering you my very humble services when I was last in The Hague. For in that case I would have had too many marvels to admire at the same time, and seeing superhuman discourse emerging from a body so similar to those painters give to angels, I would have been delighted in the same manner as it seems to me must be those who, coming from the earth, enter newly into heaven. This would have made me less capable of responding to your Highness, who without doubt has already noticed in me this failing, when I had the honor of speaking with her before; and your clemency wanted to assuage it, in leaving me the traces of your thoughts on a paper, where, in rereading them several times and accustoming myself to consider them, I would be truly less dazzled, but I instead feel more wonder, in noticing that these thoughts not only seem ingenious at the outset, but also even more judicious and solid the more one examines them.

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I can say with truth that the question your Highness proposes seems to me that which, in view of my published writings, one can most rightly ask me.<sup>7</sup> For there are two things about the human soul on which all the knowledge we can have of its nature depends: one of which is that it thinks, and the other is that, being united to the body, it can act on and be acted

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Elisabeth's later letters show her familiarity with the medical establishment, and Descartes too had interests in medicine. Moreover, while Harpocrates, or Horus, the child, is the Egyptian god of silence, and was taken up as the god of secrecy by the Greeks and Romans, there is no oath associated with him. While Harpocrates is associated with a secret medical profession in certain monuments, this same secret is contained in the Hippocratic oath: "About whatever I may see or hear in treatment, or even without treatment, in the life of human beings—things that should not ever be blurted out outside—I will remain silent, holding such things to be unutterable [sacred, not to be divulged]." Translation by Heinrich Von Staden, "In a Pure and Holy Way: Personal and Professional Conduct in the Hippocratic Oath," *Journal of the History of Medicine and Allied Sciences* 51 (1996): 406–8.

7. At this point, Descartes had published the *Discourse on the Method*, with accompanying essays (1637), and the *Meditations*, along with *Objections and Replies* (1641, 1642). He says little in those works about the philosophical basis of mind-body interaction. Cassendi, in the Fifth *Objections*, had raised a similar question, though he met with a much less hospitable reply. See AT 7:343–44, 7:389–90, 9:213, CSM 2:238–39, 266, 275–76.



Crispyn Van den Queborne. *Elisabeth, Princess Palatine* (mid-seventeenth century). Engraving, 3 3/8 × 5 1/4 in. (NPG D18201). Courtesy National Portrait Gallery, London.

upon by it.<sup>8</sup> I have said almost nothing about the latter, and have concentrated solely on making the first better understood, as my principal aim was to prove the distinction between the soul and the body. Only the first was able to serve this aim, and the other would have been harmful to it. But, as your Highness sees so clearly that one cannot conceal anything from her, I will try here to explain the manner in which I conceive of the union of the soul with the body and how the soul has the power [*force*] to move it. 665

First, I consider that there are in us certain primitive notions that are like originals on the pattern of which we form all our other knowledge. There are only very few of these notions; for, after the most general—those of being, number, and duration, etc. —which apply to all that we can conceive, we have, for the body in particular, only the notion of extension, from which follow the notions of shape and movement; and for the soul alone, we have only that of thought, in which are included the perceptions of the understanding and the inclinations of the will; and finally, for the soul and the body together, we have only that of their union, on which depends that of the power the soul has to move the body and the body to act on the soul, in causing its sensations and passions.

I consider also that all human knowledge [*science*] consists only in distinguishing well these notions, and in attributing each of them only to those things to which it pertains. For, when we want to explain some difficulty by means of a notion which does not pertain to it, we cannot fail to be mistaken; just as we are mistaken when we want to explain one of these notions by another; for being primitive, each of them can be understood only through itself. Although the use of the senses has given us notions of extension, of shapes, and of movements that are much more familiar than the others, the principal cause of our errors lies in our ordinarily wanting to use these notions to explain those things to which they do not pertain. For instance, when we want to use the imagination to conceive the nature of the soul, or better, when one wants to conceive the way in which the soul moves the body, by appealing to the way one body is moved by another body. 666

That is why, since, in the *Meditations* which your Highness deigned to read, I was trying to make conceivable the notions which pertain to the soul alone, distinguishing them from those which pertain to the body alone, the first thing that I ought to explain subsequently is the manner of conceiving

8. *Agir et pâtir avec lui*: In English, it is difficult to bring out the parallel between active and passive, which preserves the tie to the passions of the soul that will figure prominently in the later correspondence.

those which pertain to the union of the soul with the body, without those which pertain to the body alone, or to the soul alone. To which it seems to me that what I wrote at the end of my response to the sixth objections can be useful;<sup>9</sup> for we cannot look for these simple notions elsewhere than in our soul, which has them all in itself by its nature, but which does not always  
 667 distinguish one from the others well enough, or even attribute them to the objects to which it ought to attribute them.

Thus, I believe that we have heretofore confused the notion of the power with which the soul acts on the body with the power with which one body acts on another; and that we have attributed the one and the other not to the soul, for we did not yet know it, but to diverse qualities of bodies, such as heaviness, heat, and others, which we have imagined to be real, that is to say, to have an existence distinct from that of body, and by consequence, to be substances, even though we have named them qualities. In order to understand them, sometimes we have used those notions that are in us for knowing body, and sometimes those which are there for knowing the soul, depending on whether what we were attributing to them was material or immaterial. For example, in supposing that heaviness is a real quality, of which we have no other knowledge but that it has the power to move a body in which it is toward the center of the earth, we have no difficulty in conceiving how it moves the body, nor how it is joined to it; and we do not think that this happens through a real contact of one surface against another, for we experience in ourselves that we have a specific notion for conceiving  
 668 that; and I think that we use this notion badly, in applying it to heaviness, which, as I hope to demonstrate in my *Physics*, is nothing really distinct from body.<sup>10</sup> But I do think that it was given to us for conceiving the way in which the soul moves the body.

If I were to employ more words to explain myself, I would show that I did not sufficiently recognize the incomparable mind of your Highness, and I would be too presumptuous if I dared to think that my response should be entirely satisfactory to her; but I will try to avoid both the one and the other in adding here nothing more, except that if I am capable of writing or saying something that could be agreeable to her, I would always take it as a great honor to take up a pen or to go to The Hague for this end, and that there is nothing in the world which is so dear to me as the power to obey her commandments. But I cannot find a reason to observe the Hippocratic oath that she enjoined me to, since she communicated nothing to me that does not

9. AT 7:444–45, CSM 2:299–300.

10. *Principles* 4.20–27 (AT 7A:212–16, CSM 1:268–70).

merit being seen and admired by all men. I can only say, on this matter, that esteeming infinitely your letter to me, I will treat it as the misers do their treasures: the more they value them the more they hide them away, and begrudging the rest of the world a view of them, they make it their sovereign good to look at them. Thus, it will be easy for me alone to enjoy the good of seeing it, and my greatest ambition is to be able to say and to be truly, Madame,

Your Highness's very humble and obedient servant,  
Descartes.

ELISABETH TO DESCARTES

[The Hague] 10 June 1643

AT 3:683

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ebrary

M. Descartes,

Your goodwill appears not only in your showing me the faults in my reasoning and correcting them, as I expected, but also in your attempt to console me about them in order to make the knowledge of them less annoying for me. But, in detriment to your judgment, you attempt to console me about those faults with false praise. Such false praise would have been necessary to encourage me to work to remedy them had my upbringing, in a place where the ordinary way of conversing has accustomed me to understand that people are incapable of giving one true praise, not made me presume that I could not err in believing the contrary of what people speak, and had it not rendered the consideration of my imperfections so familiar that they no longer upset me more than is necessary to promote the desire to rid myself of them.

This makes me confess, without shame, that I have found in myself all the causes of error which you noticed in your letter, and that as yet I have not been able to banish them entirely, for the life which I am constrained to lead does not leave enough time at my disposal to acquire a habit of meditation in accordance with your rules.<sup>11</sup> Now the interests of my house, which I must not neglect, now some conversations and social obligations which I cannot avoid, beat down so heavily on this weak mind with an-

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11. Elisabeth here seems to be referring to what Descartes writes in the preface to reader of the *Meditations*, and in the postulates of the geometrical exposition of his philosophy in the Second Replies, where he requires that his readers "meditate seriously with me, and withdraw their minds from the senses and from all preconceived opinions" (AT 7:9, CSM 2:8; see also AT 7:162ff., CSM 2:114ff.). Doing so, however, requires that one be able to "expressly rid [one's] . . . mind of all worries and arrange for [oneself] . . . a clear stretch of free time," as the mediator does in the First Meditation (AT 7:18, CSM 2:17). It is this luxury Elisabeth cannot afford.

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noyance or boredom, that it is rendered useless for anything else at all for a long time afterward: this will serve, I hope, as an excuse for my stupidity in being unable to comprehend, by appeal to the idea you once had of heaviness, the idea through which we must judge how the soul (nonextended and immaterial) can move the body; nor why this power [*puiſſance*] to carry the body toward the center of the earth, which you earlier falsely attributed to a body as a quality, should sooner persuade us that a body can be pushed by some immaterial thing, than the demonstration of a contrary truth (which you promise in your physics) should confirm us in the opinion of its impossibility. In particular, since this idea (unable to pretend to the same perfection and objective reality as that of God) can be feigned due to the ignorance of that which truly moves these bodies toward the center, and since no material cause presents itself to the senses, one would then attribute this power to its contrary, an immaterial cause. But I nevertheless have never been able to conceive of such an immaterial thing as anything other than a negation of matter which cannot have any communication with it.

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I admit that it would be easier for me to concede matter and extension to the soul than to concede the capacity to move a body and to be moved by it to an immaterial thing. For, if the first is achieved through *information*, it would be necessary that the spirits, which cause the movements, were intelligent, a capacity you accord to nothing corporeal.<sup>12</sup> And even though, in your *Metaphysical Meditations*, you show the possibility of the second, it is altogether very difficult to understand that a soul, as you have described it, after having had the faculty and the custom of reasoning well, can lose all of this by some vapors, and that, being able to subsist without the body, and having nothing in common with it, the soul is still so governed by it.

But after all, since you have undertaken to instruct me, I entertain these sentiments only as friends which I do not intend to keep, assuring myself that you will explicate the nature of an immaterial substance and the manner of its actions and passions in the body, just as well as you have all the other things that you have wanted to teach. I beg of you also to believe that you

12. I have here retained the French *information*. It is hard to determine what theoretical model Elisabeth is adverting to. On the one hand, it is tempting to think that she is invoking the Aristotelian doctrine that the soul is the form of the body and so informs the body. On the other hand, her concern with the intelligence of corporeal spirits suggests that she is referring to a Stoic account of cognitive faculties and intentional action. The Stoics explained the cohesion of bodies and their motions toward some end, as well as the rational faculties Descartes accords to the soul (and so, one might say, the information of substances), by appeal to that part of matter termed *pneuma*.

could not perform this charity to anyone who felt more the obligation she has to you as?

Your very affectionate friend,  
Elisabeth.

DESCARTES TO ELISABETH

AT 3:690

28 June 1643, Egmond du Hoef

Madame,

I have a very great obligation to your Highness in that she, after having borne my explaining myself badly in my previous letter, concerning the question which it pleased her to propose to me, deigns again to have the patience to listen to me on the same matter, and to give me occasion to note the things which I omitted. Of which the principal ones seem to me to be that, after having distinguished three sorts of ideas or primitive notions which are each known in a particular way and not by a comparison of the one with the other—that is, the notion that we have of the soul, that of the body, and the union which is between the soul and the body—I ought to have explained the difference between these three sorts of notions and between the operations of the soul through which we have them, and to have stated how we render each of them familiar and easy to us. Then, after that, having said why I availed myself of the comparison with heaviness, I ought to have made clear that, even though one might want to conceive of the soul as material (which, strictly speaking, is what it is to conceive its union with the body), one would not cease to know, after that, that the soul is separable from it. That is, I think, all of what your Highness has prescribed me to do here.

First, then, I notice a great difference between these three sorts of notions. The soul is conceived only by the pure understanding [*l'entendement*]; the body, that is to say, extension, shapes, and motions, can also be known by the understanding alone, but is much better known by the understanding aided by the imagination, and finally, those things which pertain to the union of the soul and the body are known only obscurely by the understanding alone, or even by the understanding aided by the imagination; but they are known very clearly by the senses. From which it follows that those who never philosophize and who use only their senses do not doubt in the least that the soul moves the body and that the body acts on the soul. But they consider the one and the other as one single thing, that is to say, they conceive of their union. For to conceive of the union between two things is

to conceive of them as one single thing. Metaphysical thoughts which exercise the pure understanding serve to render the notion of the soul familiar. The study of mathematics, which exercises principally the imagination in its consideration of shapes and movements, accustoms us to form very distinct notions of body. And lastly, it is in using only life and ordinary conversations and in abstaining from meditating and studying those things which exercise the imagination that we learn to conceive the union of the soul and the body.

I almost fear that your Highness will think that I do not speak seriously here. But this would be contrary to the respect I owe her and that I would never neglect to pay her. And I can say with truth that the principal rule I have always observed in my studies, and that which I believe has served me the most in acquiring some bit of knowledge, is that I never spend more than a few hours each day in thoughts which occupy the imagination, and very  
 693 few hours a year in those which occupy the understanding alone, and that I give all the rest of my time to relaxing the senses and resting the mind; I even count, among the exercises of the imagination, all serious conversations and everything for which it is necessary to devote attention. It is this that has made me retire to the country. For even though in the most populated city in the world I could have as many hours to myself as I now employ in study, I would nevertheless not be able to use them so usefully, since my mind would be distracted by the attention the bothers of life require. I take the liberty to write of this here to your Highness in order to show that I truly admire that, amid the affairs and the cares which persons who are of a great mind and of great birth never lack, she has been able to attend to the meditations which are required in order to know well the distinction between the soul and the body.

But I judged that it was these meditations, rather than these other thoughts which require less attention, that have made her find obscurity in the notion we have of their union, as it does not seem to me that the human mind is capable of conceiving very distinctly, and at the same time, the distinction between the soul and the body and their union, since to do so it is necessary to conceive them as one single thing and at the same time to conceive them as two, which is contradictory. On this matter (supposing your Highness still had the reasons which prove the distinction of the soul and body at the forefront of her mind and not wanting to ask her to remove them  
 694 from there in order to represent to herself the notion of the union that each always experiences within himself without philosophizing, in knowing that he is a single person who has together a body and a thought, which are of such a nature that this thought can move the body and sense what happens to it), I availed myself in my previous letter of a comparison between heaviness and those other qualities which we commonly imagine to be united to some bodies just as thought is united to our own, and I was not worried that

this comparison hangs on qualities that are not real, even though we imagine them so, since I believed that your Highness was already entirely persuaded that the soul is a substance distinct from body.

But since your Highness notices that it is easier to attribute matter and extension to the soul than to attribute to it the capacity to move a body and to be moved by one without having matter, I beg her to feel free to attribute this matter and this extension to the soul, for to do so is to do nothing but conceive it as united with the body. After having well conceived this and having experienced it within herself, it will be easy for her to consider that the matter that she has attributed to this thought is not the thought itself, and that the extension of this matter is of another nature than the extension of this thought, in that the first is determined to a certain place, from which it excludes all other extended bodies, and this is not the case with the second. In this way your Highness will not neglect to return easily to the knowledge of the distinction between the soul and the body, even though she has conceived their union.

Finally, though I believe it is very necessary to have understood well once in one's life the principles of metaphysics, since it is these that give us knowledge of God and of our soul, I also believe that it would be very harmful to occupy one's understanding often in meditating on them. For in doing so, it could not attend so well to the functions of the imagination and the senses. The best is to content oneself in retaining in one's memory and in one's belief the conclusions that one has at one time drawn from such meditation, and then to employ the rest of the time one has for study in those thoughts where the understanding acts with imagination or the senses.

The extreme devotion which I have to serve your Highness makes me hope that my frankness will not be disagreeable to her. She would have here received a longer discourse in which I would have tried to clarify all at once the difficulties of the question asked, but for a new annoyance which I have just learned about from Utrecht, that the magistrate summons me in order to verify what I wrote about one of their ministers—no matter that this is a man who has slandered me very indignantly and that what I wrote about him in my just defense was only too well known to the world—and so I am constrained to finish here, in order that I may go find the means to extricate myself as soon as I can from this chicanery.<sup>13</sup> I am, &c.

13. See the Letter to Voetius, AT 8B:3–194. Parts of this very long letter are translated in CSMK 220–24. This letter, which was published in Latin and simultaneously in Flemish translation in May 1643, was written as a reply to the pointed published attacks on Cartesianism by Voetius. Voetius, as rector of the University of Utrecht, had earlier arranged for the formal condemnation of Cartesian philosophy at the university. For further reading on this dispute, see Verbeek and Marion, *La querelle d'Utrecht*); and Verbeek, *Descartes and the Dutch*. See also Descartes to Father Dinet, esp. AT 7:582ff., CSM 2:393ff., and the postscript of Elisabeth's letter of 22 June 1645 below.

AT 4:1

## ELISABETH TO DESCARTES

[The Hague] 1 July 1643

M. Descartes,

I see that you have not received as much inconvenience from my esteem for your instruction and the desire to avail myself of it, as from the ingratitude of those who deprive themselves of it and would like to deprive the human species of it. I would not have sent you new evidence of my ignorance until I knew you were done with those of that mindset, if Sieur Van Bergen<sup>14</sup> had not obliged me to it earlier, through his kindness in agreeing to stay in town, just until I gave him a response to your letter of 28 June. What you write there makes me see clearly the three sorts of notions that we have, their objects, and how we ought to make use of them.

I also find that the senses show me that the soul moves the body, but they teach me nothing (no more than do the understanding and the imagination) of the way in which it does so. For this reason, I think that there are some properties of the soul, which are unknown to us, which could perhaps overturn what your *Metaphysical Meditations* persuaded me of by such good reasoning: the nonextendedness of the soul. This doubt seems to be founded on the rule that you give there, in speaking of the true and the false, that all error comes to us in forming judgments about that which we do not perceive well enough.<sup>15</sup> Though extension is not necessary to thought, neither is it at all repugnant to it, and so it could be suited to some other function of the soul which is no less essential to it. At the very least, it makes one abandon the contradiction of the Scholastics, that it [the soul] is both as a whole in the whole body and as a whole in each of its parts.<sup>16</sup> I do not excuse myself at all for confusing the notion of the soul with that of the body for the same reason as the vulgar; but this doesn't rid me of the first doubt, and I will lose hope of finding certitude in anything in the world if you, who alone have kept me from being a skeptic, do not answer that to which my first reasoning carried me.

14. Antonie Studler Van Surck, sieur de Bergen (1606–66), was Descartes' banker in Holland and sometimes acted as intermediary for Descartes' letters. In particular he often served as intermediary in Descartes' correspondence with Huygens. Elisabeth might well have known him through this connection with Huygens, since she too corresponded with Constantijn Huygens (1596–1687), a noted humanist scholar and father of the mathematician and physicist Christian Huygens (1629–95)). In addition, the sieur de Bergen was charged with the distribution of the *Principles* in Holland, while Descartes was in France in 1644.

15. See the rule arrived at and articulated in the Fourth Meditation: "If, however, I simply refrain from making a judgment in cases where I do not perceive the truth with sufficient clarity and distinctness, then it is clear that I am behaving correctly and avoiding error" (AT 7:59, CSM 2:41).

16. See for example, Aquinas, *Summa Theologica*, I, q.76 a.8.

Even though I owe you this confession and thanks, I would think it strongly imprudent if I did not already know your kindness and generosity, equal to the rest of your merits, as much by the experience that I have already had as by reputation. You could not have attested to it in a manner more obliging than by the clarifications and counsel you have imparted to me, which I hold above all as one of the greatest treasures that could be possessed by

Your very affectionate friend at your service,

Elisabeth.

DESCARTES TO ELISABETH

AT 4:37

Egmond, 17 November 1643<sup>17</sup>

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Madame,

Having learned from M. de Pollot that your Highness has taken the trouble to consider the problem of three circles,<sup>18</sup> and that she has found the way to solve it by supposing but one unknown quantity, I thought that my duty obliged me to set out here the reason why I had proposed using several unknown quantities and in what way I solve for them.

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In considering a problem in geometry, I always make it so that the lines which I use to find the solution to the problem are parallel or intersect at right angles as much as is possible; and I do not consider any other theorems but that the sides of similar triangles have a similar proportion between them, and that in right triangles, the square of the base is equal to the sum of the squares of the sides. I do not fear supposing more unknown quantities to reduce the problem to such terms so that it depends only on these two theorems. On the contrary, I prefer to suppose more of them than fewer. For, by this means, I see more clearly all that I do, and in solving for them I do better at finding the shortest paths and avoid superfluous multiplications. On the other hand, if one draws other lines and makes use of other theorems, even though it could

17. Verbeek et al., *Correspondence*, were able to date this letter more precisely from the covering note to Pollot. They also note that the British Library contains two manuscript copies of this and the subsequent letter in the papers collected by Thomas Birch (Add. 4278 [Birch], fols. 150r–151v and Add. 4278 [Birch], fols. 159r–160v. These contain the papers and correspondence of John Pell, and so indicate that Pell had copies made. In between the two copies is Pell's translation.

18. The problem here is to find the radius of a fourth circle whose circumference touches those of three given ones, or what is usually called Apollonius's problem. Elisabeth seems to have learned her geometry from a textbook (*Algebra ofte Nieuwe Stel-Regel*) written by Johan Stampioen, which Descartes had criticized. See Stephen Gaukroger, *Descartes: An Intellectual Biography* (New York: Oxford University Press, 1995), 334–35, 387. After setting this problem, Descartes was concerned that he had set the bar too high. See his letter to Pollot, 21 October 1643, AT 4:26.

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