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Rule VIII of Descartes’ *Regulae ad directionem ingenii*

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**Abstract**. Rule VIII of Descartes’ *Regulae ad directionem ingenii* plays a prominent role in the argument that Descartes dropped his early method. On the developmental reading, Descartes first praised his method in the early strata of composition, but then demoted the method to provisional in the “blacksmith” analogy, and later found that his discrete method could not resolve his new inquiry into the essence and scope of human knowledge, an event that resulted in him dropping his method. In this paper, I explain how this rule can be read as a coherent title and commentary that is a further development of the method of the *Regulae*.

**Key Words**: René Descartes, *Regulae ad directionem ingenii*, method, Rule VIII, Jean-Paul

Weber, John A. Schuster, Daniel Garber.

Before Jean-Paul Weber’s patchwork thesis, commentators presupposed that Descartes’ *Regulae ad directionem ingenii* composed a homogenous, methodological work that was written between 1626 and 1628.[[1]](#footnote-1) The method, on this view, was at the center of Descartes’ natural philosophy, for it resulted in his publication of the *Discours de la Méthode* (1637), the content of the *Essais* (1637), and the metaphysics in the *Meditationes* (1641).[[2]](#footnote-2) Weber’s thesis, what I call the developmental thesis, however, casts serious doubt on the traditional methodological story. On this view, there was no single method described in the *Regulae* but a series of them, projects stacked upon projects with corresponding methods, which, as will be seen, culminated in Descartes altogether dropping the method around 1628 as he began drafting *Le Monde* (1632), *L’homme* (1633), *Les* *Météores*, and *Dioptrique* (1637).[[3]](#footnote-3)

The final transition in the *Regulae*, the one that is proposed to have resulted in the demise of the early method, occurs in Rule VIII, where Descartes moved away from his discrete method of scientific questions pursued in Rules I-XI and transitioned to his mature question, “What is the essence and scope of human knowledge?” This transition occurred in several stages in Rule VIII, a claim that has been adopted by commentators as content that must be explained by any viable interpretation.[[4]](#footnote-4) On Weber’s reading, Descartes continued the development of his early method at the first instance of the rule, mainly the title and the second paragraph, what Weber called Rule VIII-B, where, immediately thereafter, Descartes provided one of his most definitive examples, the anaclastic line in optics. However, as the rule develops, Weber tells that Descartes began to question the veracity of the early method in his three drafts of his inquiry into the essence and scope of human knowledge, what he called the “finest example of all.” In the first formulation, Descartes described his problem in terms of his early method, casting the problem as knowledge of what cannot be intuited in one of his piecemeal questions.[[5]](#footnote-5) However, in the second, the method was demoted to “provisional” in the analogy of the “blacksmith,” and then, in the third, it is told that he questioned the veracity of the method, now seeking its legitimization. These episodes, for Weber, amounted to just that, stages in Descartes’ inquiry on his mature epistemic question. The first two formulations of the “finest example” along with his anaclastic line example were placed by Descartes at the end of the Hanover manuscript (but not the Dutch manuscript), which led Weber to propose that Descartes critically reflected on his mature question over a period of time and, for this reason, this material, what Weber called VIII-C, amounted to early provisional drafts of the “finest example,” while the third formulation, Weber’s VIII-D, was the final and most developed draft.[[6]](#footnote-6) For Weber, this final stage of Descartes’ development was no longer a negative contribution to the early piecemeal method but was a construction of a new project that was being mapped out at the end of Rule VIII and developed in Rule XII and following.

It is at this point, the final stage of Weber’s reading of Rule VIII, where many commentators diverge into differing explanations as to why Descartes dropped his early method. In this paper, I provide a critical analysis of two influential explanations, Daniel Garber’s epistemic and John A. Schuster’s ontological explanation. In contrast, I argue that Rule VIII contains a coherent title and commentary, one that is, broadly construed, consistent with his later rhetorical presentation of his science and metaphysics. My aim, however, is not to revive the once traditional view concerning the actual centrality of Descartes’ method, for I have escaped the “cult of method,” as Schuster would put it.[[7]](#footnote-7) Rather, I hold that Descartes did not apply his method to his natural philosophy, as others have shown in their reconstructions of Descartes’ early science.[[8]](#footnote-8) On the other hand, it is evident from Descartes’ early writings that method was claimed to be important, if not a centerpiece, to his rhetorical presentation of his early science. For this reason, my interest in this essay is Descartes’ early conceptualization of his early method and science. My question is not whether Descartes could link up his methodical practice with the true state of things in nature but whether he could provide a coherent conceptualization of his scientific project in Rule VIII in particular and the *Regulae* in general. In the first part of the paper, I explain the general thrust of the developmental reading of the *Regulae*, identifying the principal aim of Descartes’ early project of “*mathesis* *universalis*” and, then, his turn to develop a “universal method” for, first, discrete questions and, then, for a more general explanation of the unity of the sciences. In the second part, I argue, contrary to the developmental reading, that the aim of Descartes’ early method was broad and not narrow, an aim that he explicitly developed in his anaclastic line example. This interpretation, I will argue, provides a consistent transition between the general aim of Rule I, the anaclastic line example, and, as will be seen, Descartes’ “finest example of all.” In the third part, I explain that Descartes did not claim that his “method” – the cognitive psychology and procedure – was “provisional” in the blacksmith metaphor. Rather, I take it that his claim was his early objects of knowledge thus far examined were provisional. He thus presumed the veracity of the early procedure and sought to discover axioms capable of deducing the sciences, essentially the task of his mature philosophy. In the fourth part, I turn to the final draft of the “finest example” and provide a critical analysis of Garber’s and Schuster’s explanations of why Descartes dropped his early method. I then conclude the paper with comments on the composition and dating of the *Regulae*.

**1. The Developmental Reading of the *Regulae***

The *Regulae* was Descartes’ sketchbook, where he drafted his early conception of the method.[[9]](#footnote-9) Published after Descartes’ death, the *Regulae* composes a series of 21 rules, which is his most systematic composition on method. Descartes explained in Rules VIII and XII that the *Regulae* was intended to contain three sets of twelve rules.[[10]](#footnote-10) The first set was to explain the main precepts of the method; the second, his application of the method on already-solved problems; and, in the third, his application to problems not yet solved.[[11]](#footnote-11) The *Regulae*, however, was never finished. He completed the first twelve rules with commentaries. On the other hand, the second set was left incomplete, and the final twelve were never composed.[[12]](#footnote-12) Further, there are various other obstacles for an interpretation. There is very little correspondence during the period of 1619 to 1629, when the method was most likely drafted, especially concerning the proposed projects contained in the *Regulae*. As well, the text contains various inconsistencies scattered throughout.

Descartes’ *Regulae*, on the developmental interpretation, does not contain a single homogeneous project, but three separate ones, distinguished in Rules IV and VIII. On this reading, Descartes began composition of his *Regulae* with his “*mathesis* *universalis*” (drafted from March to November 1619),[[13]](#footnote-13) which now makes up the latter half of Rule IV, a claim that is supported by the Hanover Manuscript,[[14]](#footnote-14) which places this portion of Rule IV (Weber’s Rule IV-B) at the end as an appendix, as if this material was different than the remainder of the text.[[15]](#footnote-15) The aim of his mathesis universalis, it is proposed, was to devise a method capable of solving any question in mathematics, not only in “arithmetic and geometry,” but also in the mixed-mathematical sciences: “astronomy, music, optics, mechanics, among others.”[[16]](#footnote-16) Descartes’ project was thus restricted in scope, a purely mathematical discipline.[[17]](#footnote-17)

Jean-Luc Marion and Fredrick Van de Pitte, however, have given a plausible alternative to Weber’s interpretation. Descartes’ “*Mathesis* *universalis*,” on their reading, should be interpreted as “universal learning” or “universal method,” which links Rule IV to the stated aim of the *Regulae* in Rule I, to answer any question that is capable of human knowledge.[[18]](#footnote-18) On the Marion-Van de Pitte thesis, broadly construed, Descartes’ early project was not strictly mathematical but was about learning in general, incorporating quantitative and qualitative explanations as Descartes later pursued in the *Dioptrique* and *Les* *Météores*.

On the developmental reading, the project of mathesis universalis, that is, the proposed mathematical discipline, was short-lived. By November 1619, Descartes had demoted the limited discipline of “*mathesis* *universalis*” to an “outer garment” of the method, as he explained in Rule IV, “ordinary mathematics is far from my mind here.”[[19]](#footnote-19) Descartes now had a grander idea: he aimed to “direct the mind with a view to forming true and sound judgements about whatever comes before it.”[[20]](#footnote-20) This formulation of the method, his general or universal method, developed in Rules I through XI (excluding the latter portions of Rule VIII), aimed to answer any question capable of human knowledge. This so-called universal method was likewise limited in scope. Descartes’ 1619 enthusiasm for a universal method was just that: all he had developed by 1620 was a basic-cognitive psychology and a set of general-heuristic rules, nothing definitive or concrete that could guide his inquiry. Moreover, his actual scientific investigations show that his interests, like other natural philosophers during the period (Johannes Kepler, Galileo Galilei, Simon Stevin, Isaac Beeckman, and Marin Mersenne, among others), were restricted to specific questions. He had investigated individual topics in music theory,[[21]](#footnote-21) the law of falling bodies,[[22]](#footnote-22) Stevin’s hydrostatic paradox,[[23]](#footnote-23) various problems in geometry,[[24]](#footnote-24) and the refraction of light.[[25]](#footnote-25) On this reading, Descartes made no attempt to pursue the general aim of Rule I before 1628. Moreover, there is no evidence that he was interested in skepticism or epistemological problems at this time.[[26]](#footnote-26) Rather, on this count, Descartes was a traditional-natural scientist, using “physco-mathematical” methods to solve discrete-scientific problems.[[27]](#footnote-27)

The general method, at least, as Descartes envisioned it in the early 1620s, was similarly short-lived on the developmental reading, for, by 1628, Descartes now desired a method that could respond to a mitigated version of skepticism and one that additionally could explain the essence and scope of human knowledge.[[28]](#footnote-28) This turn in Descartes’ thought eventually resulted in a drastic change in his method, one that Garber and Schuster argued to have resulted in its demise. The focal point was Rule VIII, which I will now turn.

**2. The Anaclastic Line Example**

There are no definitive examples of Descartes’ method in the *Regulae*, at least, not until Descartes’ composition of Rule VIII, where he provides a reconstruction of his discovery of the anaclastic curve.[[29]](#footnote-29) The title of this rule informs that if an agent cannot reach an intuition in a given problem, then the agent should “stop at that point, and refrain from the superfluous task.”[[30]](#footnote-30) The lesson, as Descartes saw it, is that the rule helps us to avoid mistakes, to avoid willing objects outside of the intellect, as he later put it in the *Meditationes*.[[31]](#footnote-31) It is generally agreed by commentators that the title and second paragraph of Rule VIII is a further development of the 1619-1620 formulation of the method.[[32]](#footnote-32)

Descartes’ way forward in this rule was to illustrate the title with two examples: the anaclastic line example and, what he called, the “finest example of all.” The former poses a scientific question: what is “the line from which parallel rays are so refracted that they intersect at a single point?”[[33]](#footnote-33) From this question, Descartes begins his inquiry by reducing the obscure question to what he thought was a simple-intuitable one.[[34]](#footnote-34) This is commenced by asking a series of targeted questions, aimed at each level to reduce the obscure proposition to a more simplified one, bit-by-bit, culminating in the discovery of an intuition. The original question, he informed, “…depends on the ratio of the angles of refraction to the angles of incidence,” which, likewise, is dependent on the refraction of light brought about by the “differences in the media.”[[35]](#footnote-35) A solution to this problem, moreover, is reliant “on the manner in which a ray passes through the entire transparent body.”[[36]](#footnote-36) As well, Descartes claimed, this whole series of questions is determined by the “nature of the action of light,” and the conception of “natural power,” which Descartes described as an intuition.[[37]](#footnote-37) According to Rule V, this discovery would lead to the deductive phase of the method, which Descartes did not disclose.[[38]](#footnote-38)

On the developmental reading, Descartes’ example of the anaclastic curve indicates that the early method was restricted to discrete scientific and mathematical questions. Garber and Schuster propose two routes to this conclusion. First, Garber claimed that Descartes’ reconstruction of his discovery of the anaclastic curve was a definitive example of the method, one where we can derive additional, though not formally stated, principles, amending the original method over and above the early rules.[[39]](#footnote-39) He explains, “Matters are clarified considerably in an example Descartes gave late in the composition of the *Rules*, where the programmatic bravado of the earlier years is translated into practice.”[[40]](#footnote-40) This example, of course, was Descartes’ anaclastic line example where he explicitly asks a specific scientific question. What follows, for Garber, is an implicit rule that claims the method is restricted to discrete questions.[[41]](#footnote-41)

Schuster, on the other hand, reasons from different premises. The method, on his reading, was not used in Descartes’ early-scientific discoveries.[[42]](#footnote-42) Rather, he argues that the method was a “rhetorical device” that Descartes used to justify his new “physico-mathematical project.”[[43]](#footnote-43) For Schuster, the “anaclastic line example” was merely a reconstruction of how Descartes “could have discovered” the law of refraction and the anaclastic curve, not how he actually discovered it.[[44]](#footnote-44) Thus, on Schuster’s reading, Descartes did not limit the method to individual questions, for the method was a ruse. Rather, Schuster claims the early aim of Descartes’ science (and thus the rhetoric of his method) was narrow because all of his actual investigations were narrow during this period.

The question, then, is whether Descartes’ aim was indeed narrow before 1628. Schuster’s and Gaukroger’s extensive studies of Descartes’ early science have correctly shown that his interests were discrete.[[45]](#footnote-45) However, I add to this that Descartes’ fundamental aim in 1619-20 was to explain the “interconnectedness of the sciences,” an aim that he had pursued by the period of 1626-28. To begin this task, let’s first make clear that Descartes had systematic aims in 1619. Then, I will explain how the anaclastic line example could be conceived as part of Descartes’ broader program. In late 1619, Descartes had systematic hopes. After his well-known dreams, Descartes claimed that his aim was to explain “chains linking the sciences,”[[46]](#footnote-46) an aim he seemed to have taken seriously, at least, in a general sense.[[47]](#footnote-47) Not long after drafting his unfinished *Olympica*, Descartes began writing his *Regulae* and told in Rule I that the aim of his studies was to provide sound answers to any question *whatever*.[[48]](#footnote-48) His method, he explained, was not restricted to specific questions – “not with a view to solving this or that scholastic problem” – but, rather, he proposed a broader view, the task of reordering the Scholastic sciences according to human reason.[[49]](#footnote-49) He wrote, “It must be acknowledged that all the *sciences* *are so* *closely* *interconnected* that it is much easier to learn them all together than to separate one from the other.”[[50]](#footnote-50) This is possible because he thought there were indubitable natures that are common, or foundational, to the structure of the sciences, and knowledge of these enables one to deduce consequences that are practically useful from more abstract disciplines. He wrote in Rule I:

Indeed, it seems strange to me that so many people should investigate with such diligence the virtues of plants [botany], the motions of the stars [astronomy], the transmutations of metals [chemistry], and the *objects of similar disciplines*, while hardly anyone gives a thought to *good sense* [bonâ mente] – to *universal wisdom* [universali Sapientiâ].[[51]](#footnote-51)

Descartes’ reference to “good sense” is an explicit reference to “human reason,” as he later wrote in the *Discours*, “…the power of judging well and of distinguishing the true from the false…is what *we properly call ‘good sense’* [bon sens (1637); bonam mentem (1644)] *or ‘reason’* [la raison (1637); rećtam rationem (1644)].”[[52]](#footnote-52) Descartes thus thought it was odd for the Scholastics to begin their studies with botany, astronomy, and other scientific disciplines that deal with corporeal “objects” known through the senses. Rather, the sciences should be studied simultaneously, at once, by investigating the objects of reason, objects, or axioms, which are common to all of the sciences.[[53]](#footnote-53)

Descartes also indicated the aim of his studies in Rule IV when he proposed his project “*mathesis* *universalis*.” He wrote,

[…] ordinary mathematics is far from my mind here, that it is quite another discipline I am expounding [mathesis universalis or universal learning] […] *This discipline should contain the primary rudiments of human reason* and extend to the *discovery of truths in any field whatever*.[[54]](#footnote-54)

Descartes sought the foundations of the sciences and the “primary rudiments,” or axioms common to the sciences, that were, for him, innate, as he explained in regard to the ancients: “I am convinced that certain primary seeds of truth *naturally implanted in human minds* thrived vigorously in that unsophisticated and innocent age.”[[55]](#footnote-55) These axioms, moreover, were to extend to all the sciences, “to the discovery of truths in any field whatever.”[[56]](#footnote-56)

All of this amounted to claims in 1619; very little was worked out with any specificity, as Schuster and Garber have highlighted. This, however, does not require us to drop Descartes’ stated aim from our interpretation. Rather, I think this feature of Descartes’ project is important for understanding his early formulation of the method. In late 1619, the method was a work in progress. He had lofty aims and, by 1626, he had discovered the “law or refraction” and derived the “anaclastic curve” in optics, a discovery he was to reinterpret in terms of his method, that is, in terms of his aim to explain the unity of the sciences. Let’s see how this was done. The problem of the anaclastic is a discrete question in optics. However, if we highlight how Descartes proceeds in answering this question, it becomes clear that he thinks that it is dependent on other, what he thinks are more foundational, disciplines. In Rule VIII, he begins with “the line from which parallel rays are so refracted that they intersect at a single point” and tells that this depends on the law of refraction, “the ratio of the angles of refraction to the angles of incidence.”[[57]](#footnote-57) He immediately highlights that “refraction” cannot be explained by the limited perspective of a mathematician, for “he will not be able to find out what this ratio is, since it has to do with *physics* ratherthanwith *mathematics*.”[[58]](#footnote-58) That is, from the limited perspective of a mathematician, the agent cannot reduce the proposition to an intuition and, for this reason, must stop and refrain from this superfluous task, as Descartes tells in the title of the rule. Rather, he recommends that an agent ought to take the broader perspective of a “philosopher,” linking Rule VIII to Rule I, for the agent will find that he will make “far greater progress than those that devote themselves to particular studies.”[[59]](#footnote-59)

For Descartes, the “law of refraction” thus depended on principles of “physics,” that is, a theory of light and lens.[[60]](#footnote-60) His next move was to explain that the anaclastic also depended on a physiological explanation of sight. He told that the whole dilemma of explaining the anaclastic curve depended on the “nature of light’s action,” which, likewise, depended on the conception of “natural power.” Descartes’ understanding of this latter concept is somewhat ambiguous.[[61]](#footnote-61) For clarity, Garber directs us to Rule IX where Descartes seems to link “natural power” with the “local motions of bodies.”[[62]](#footnote-62) Garber reasoned that Descartes’ “intuitive judgment” would come from the simple nature “motion,” but Garber concluded, “it is not clear how exactly he thought this would work.”[[63]](#footnote-63) Schuster takes a similar position.[[64]](#footnote-64)

Why should we take Descartes’ conception of “natural power” as the natural motion of a corporeal body? There seems to be another alternative. I think that Descartes’ reference to “natural power in general” in Rule VIII referred, in part, to an agent’s “natural-cognitive power,” or “natural faculty,” relating sight by analogy to the other senses: touch, taste, smell, and hearing, as was Descartes’ strategy in Rule XII. To see how this interpretation works, let’s begin with Garber’s proposal. He claimed that “natural power” amounted to “motion,” or the “locomotion of bodies,” but this interpretation seems problematic, for, in the anaclastic line example, motion (or tendency to motion) is the “natural action of light,” a proposition that Descartes described as dependent on his conception of “natural power.” Schuster explains, “[Descartes’] basic theory of light is that light is a tendency to motion, an impulse, propagated instantaneously through continuous optical media.”[[65]](#footnote-65) The “action of light,” then, is the instantaneous tendency of motion that is described in Rule IX.[[66]](#footnote-66) However, Descartes described the motion of light as distinct from his intuition of “natural power” in the anaclastic line example. For this reason, “natural power” most likely does not refer to local motion.

What then was “natural power” for Descartes? He gives us some guidance in Rule VIII:

If […] he is unable to discern at once what the *nature of light’s action* is, in accordance with Rule Seven he will make an enumeration of *all the other natural powers* [potentiasnaturales], in the hope that a knowledge of some other natural power will help him understand this one, if only by way of analogy.[[67]](#footnote-67)

Contrary to the present analysis, Descartes thought the agent would be confused about the “natural action of light,” not the conception of “natural power,” for I take it that Descartes thought that no one can teach the innate faculties of sense perception. Descartes thought that the agent’s knowledge of the impulse of light and the intuition of a “natural power” were connected, such that if one is confused about light, he can compare sight to other “natural powers,” mainly touch, and explain visual cognition by analogy.[[68]](#footnote-68)

Not long after his composition of Rule VIII, he turned to an explanation of sight in Rule XII, which is to be expected. He told in Rule VIII that there would be a more exhaustive explanation to come and began Rule XII, where he provided an explanation of sense perception in general.[[69]](#footnote-69) He wrote, “First, in so as our external senses are all parts of the body, sense-perception, strictly speaking, is merely passive […]; [it] occurs in the same way in which wax takes on an impression from a seal.”[[70]](#footnote-70) He did not have an analogy in mind with the wax and seal example. Rather, he thought the sentient body was really changed by the impulse of the external object. He then compared the individual senses by way of analogy in Rule XII. He wrote,

This is the case […] not only when we *feel* some body as having shape, as being hard or rough to the *touch* etc., but when we have a tactile perception of heat or cold and the like. The same is *true of the other senses*: thus, in the *eye*, the first opaque membrane receives the shape impressed upon it by multi-colored light; and in the *ears*, the *nose* and the *tongue*, the first membrane which is impervious to the passage of the object thus take on a new shape from the *sound*, the *smell* and the *flavor* respectively.[[71]](#footnote-71)

Descartes’ intuition in Rule VIII thus begins with the consciousness of sensation. He further thought that this power had a connection to the “action of light.” In order to see, he thought, one not only needs consciousness, but, in addition, there must be some external impulse on the retinal nerve. Thus, the datum of Descartes’ intuition contains the phenomenological perception of sensual consciousness along with knowledge of causation in general, for the nature of light, stars, and magnetism are all known by an external impulse on the sensory faculties. If I touch, there is an impulse on my fingers. Similarly, if I hear sound, there is an impulse of the structure of air in my ears. For this reason, Descartes thought that a Cartesian investigator would see that his intuition of “natural power” necessitates the “natural action of light” as the “tendency to motion,” if not by way of analogy with the other senses.[[72]](#footnote-72)

Based on my reading, the anaclastic line example is an instance of a specific question, as the developmental reading has claimed. However, Descartes’ reconstruction of his discovery aims to explain how this problem in optics is dependent on explanations in physics and physiology, which indicates that it is likewise an example of the general aim of Rule I. That is, in order to reduce obscure questions in optics, Descartes thought that you cannot have a narrow aim like a mathematician, but you must pursue problems as a philosopher and understand that knowledge is interconnected such that optical problems are dependent on foundational disciplines of physics and physiology.

**3. The Blacksmith Analogy**

Following the anaclastic line example, Descartes announced “the problem of investigating every truth for the knowledge of which human reason is adequate,” what he coined the “finest example of all.”[[73]](#footnote-73) He provided three formulations of this example. In the first, he described it in the language of the early method. However, in the next two formulations, it is told that Descartes critically reflected on his problem where the project evolved from an example of the method to a new philosophical program concerned with epistemology. His “example” was a response to his new interest in a mitigated version of skepticism that had emerged and sparked the interests of many Parisian savants,[[74]](#footnote-74) which, for him, put the method itself under investigation. On the developmental interpretation, he, in the second formulation of his example, questioned his early account and held that the method was provisional.

He announced his dilemma: “we ought once in our life carefully to inquire as to what sort of knowledge human reason is capable of attaining.”[[75]](#footnote-75) He did not pursue this inquiry. Rather, he immediately turned to an analogy, which, on the developmental reading, introduces an interesting prelude to a new phase of Cartesian philosophy and the demise of his early method. He wrote,

Our method in fact resembles the procedures in the mechanical crafts, which have no need of methods other than their own, and which supply their own instructions for making their own tools. If, for example, someone wanted to practice one of these crafts – to become a blacksmith, say – but did not possess any of the tools, he would be forced at first to use a hard stone (or a rough lump of iron) as an anvil, to make a rock do as a hammer, to make a pair of tongs out of wood and to put together other such tools as the need arose. Thus prepared, he would not immediately attempt to forge swords, helmets or other iron implements for others to use; rather he would first of all make hammers, an anvil, tongs and other tools for his own use. What this example shows is that since in these preliminary inquiries we have managed to discover only some rough precepts that appear to be innate in our minds rather than the product of any skill, we should not immediately try to use these precepts to settle philosophical disputes or to solve mathematical problems. Rather, we should use these precepts in the first instance to seek out with extreme care everything else which is more essential in the investigation of truth, especially since there is no reason why such things should be thought more difficult to discover than any of the solutions to the problems commonly set in geometry, in physics, or in other disciplines.[[76]](#footnote-76)

Descartes, on the developmental reading, introduced a shift in his thought, one away from using raw tools, the early rules of the method (the assumed veracity of intuition and deduction), to forging more useful tools, a new method crafted by the early rules. For instance, Garber writes, “like the provisional tools that the would-be blacksmith has fashioned out of sticks and stones […] the *rules of method* previously laid down must be regarded as being merely *provisional*.”[[77]](#footnote-77) Similarly, Schuster writes, “The early Rules are thus demoted to ‘rough precepts’, despite the fact that Rule 7 indicated that the whole of the method consists in the heuristic aids included in the first few rules.”[[78]](#footnote-78) On this reading, the analog for “provisional tools” was Descartes’ procedure for the cognitive faculties, his method of reduction and composition summarized in Rule V.[[79]](#footnote-79) Furthermore, Descartes’ new task on this reading was to clarify (or change) his piecemeal conception of the method, so that it was capable of answering his new, more systematic, project.

On my reading, it seems unlikely that Descartes would have questioned his general heuristic strategy of reducing complicated matters to self-evident intuitions and then deducing a complex resolution. By the very definitions of intuition and deduction, he would have thought this procedure would ensure certainty.[[80]](#footnote-80) If we take a closer look at the “blacksmith” analogy, we will see that Descartes was not claiming the procedure of the method was “provisional,” but the objects of knowledge were. At the outset of the analogy, he wrote, “the method […] resembles the procedures in the mechanical crafts, *which have no need of methods other than their own*, and which supply their *own instructions* for making their own tools,”[[81]](#footnote-81) His claim was his philosophical method, i.e. the procedure of the intellectual faculties, like the method of the “mechanical crafts,” is autonomous to the agent. For example, if a blacksmith did not have tools, he would use a “rock as a hammer” and “make a pair of tongs out of wood.” That is, the blacksmith would use the basic objects around him because the method, or skill, of the blacksmith is not in the tools, but in the rational subject. Similarly, a philosopher who seems to not have the necessary tools for solving problems in natural philosophy does not need to consult a logic text of the Scholastics or some other set of logical rules external to the mind because the procedure of the method is innate for Descartes, derived from the faculties of intuition and deduction.[[82]](#footnote-82)

What, then, was “provisional” in the analogy? What were the “tools” and “objects” that could be crafted by the procedure of the method? I think this content referred to the simple ideas thus far discovered by Descartes. Besides his anaclastic line example, he had not disclosed (and, perhaps, had not made) any progress on his explanation of the interconnectedness of the sciences. The *Regulae*, in fact, lacks any details of how Descartes understood this broader project. At best, in 1626, he had a semblance of his mature metaphysical ideas: his “*potentias naturales*” in Rule VIII,[[83]](#footnote-83) a statement similar to his mature cogito in Rule III,[[84]](#footnote-84) the proposition “rational soul is incorporeal” in Rule VII,[[85]](#footnote-85) and a limited conception of “extension” in Rule VI.[[86]](#footnote-86) These scattered precepts, however, were nothing close to the metaphysics later drafted in the *Discours*, *Meditationes*, and *Principia*, as Descartes made clear in his explanation of the “blacksmith analogy.”[[87]](#footnote-87) He told that the “rough precepts,” that “appear to be innate” and not the product of any skill, should not be used to solve problems in the sciences, for his development of structure of the sciences was just beginning, at least, in comparison to the structure described in the *Discours* and the tree of philosophy described in the French Preface to the *Principia*. He had not yet discovered axioms capable of deducing what he conceived as the unity of the sciences. For this reason, he bracketed his early epistemic foundations, deemed them provisional, and planned to test their usefulness for his grand project. His aim, however, in the long run, was to discover “everything else which is more essential in the investigation of truth.”[[88]](#footnote-88)

He thus planned to take his early formulation of the method of reduction and test his “absolute natures,” assessing which of the general features of reality were suitable to deduce answers in the sciences. For instance, Descartes next wrote in Rule VIII, “[…] there is no reason why such things should be thought more difficult to discover than any of the solutions to the problems commonly set in geometry, in physics, or in other disciplines.”[[89]](#footnote-89) For Descartes, the discovery of universal axioms capable of deducing explanations in the sciences should not be thought “more difficult” than problems in individual disciplines, for the axioms of any particular discipline would be included in the set of universal axioms. What is important from this, on my interpretation, is that Descartes’ claim is not that he was going to reassess the early method (the procedure for the faculties) and set it as provisional but that he was going to nail down the particular objects of knowledge that were to be his epistemic foundation, an application of his proposed procedure, as he wrote in Rule VII, “our task in the remainder of the treatise will be confined almost entirely to *explicating in detail what we have so far covered in general terms*.”[[90]](#footnote-90)

**4. The “Finest Example of All”**

In the next stage of the developmental argument, it is told that Descartes diagnosed severe problems with his method in his attempt to answer his inquiry into the nature and scope of human knowledge, problems that resulted in him fundamentally changing and later dropping the method. Immediately after the blacksmith analogy, Descartes gave his final formulation of the “finest example” in Rule VIII. He, once again, asked, “What is human knowledge and what is its scope?” and explained, “the *true instruments of knowledge* andthe *entire method* areinvolved in the investigation of the problem.”[[91]](#footnote-91) Garber proposes that Descartes attempted to apply his discrete method to his “finest example.” Garber writes, “Descartes tells us in both Rule 8 and Rule 12, we must deal with two sorts of things, ‘we who know and the things themselves which are known.’”[[92]](#footnote-92) This, Garber claimed, is the “first step in the reduction of the question at hand to simpler questions,” but, at this early stage in the investigation, the reduction ceases and Descartes “chooses merely to outline the kind of answer that, he thinks, would result from a proper investigation.”[[93]](#footnote-93) On Garber’s reading, Descartes deemed the method provisional in the blacksmith analogy for just this reason; the discrete method was too narrow to solve his new systematic project.

Garber, moreover, diagnosed the flaw that resulted in Descartes changing the method in his mature philosophy. He claims, “the *Rules* is grounded in an underling epistemology,” one that went unexamined in 1619.[[94]](#footnote-94) Descartes assumed the veracity of intuition and deduction in the early strata of the *Regulae*. However, in his mature writings, Garber holds that Descartes’ early foundation, the foundation of the *Regulae*, has grown roots. The faculty of intuition does not verify knowledge in the *Meditationes*, but, rather, his new metaphysics takes this role. The story is told that Descartes’ failure of explaining the interconnectedness of the sciences and his new interest in answering a mitigated version of skepticism in 1628 resulted in him reexamining the foundations of his method. By 1641, he thought that clear and distinct intuitions were not certain and needed scaffolding by a veracious God.[[95]](#footnote-95)

Contrary to the developmental reading, there are reasons for holding that Descartes was still developing his early conception of method in his mature philosophy. First, it is not entirely certain that Descartes applied his method to the “finest example” in Rule VIII. The purpose of the early project was to state the method, not to apply it. In the *Discours*, Descartes tells that he purposefully did not carry out his justificatory project at the age of twenty-three but practiced the method to become more acquainted with it.[[96]](#footnote-96) He meticulously practiced his “self-prescribed method in order to strengthen [himself] more and more in its use.”[[97]](#footnote-97) For this reason, it was not Descartes’ task to justify his early epistemology in Rule VIII or in the *Regulae* but to state the method and to practice it. For this reason, the “finest example” was more of a general outline of his overall epistemic project, an example of how he would use Rule VIII – to not will objects outside of the intellect – while developing the general aim of Rule I.

Second, although the method seems to have grown roots in 1641 and God now supports his faculty of intuition, this should be considered a development of the foundations of the method, not a replacement of it. Descartes did get started on his reconstruction project during the 1620s, at least the reductive portion. In the *Discours*, he told that he doubted the principles of his Scholastic education and that he “planned” to reform the body of the sciences by doubting principles that he had “hitherto given credence,” planning to “get rid of them, all at one go, in order to replace them with better ones.”[[98]](#footnote-98) We know the end result of his uprooting was the 1641 *Meditationes*, where both the cogito and the veracity of God play an important role for Descartes’ construction of his epistemic foundation. The method thus grew roots, as Garber has noted. This development, however, is not a problem for the method as Descartes conceived it in his early composition of the *Regulae*. He explicitly claimed at the end of Rule VII that the general procedure of the method, dictated by his cognitive psychology, was, in essence, complete. The only outstanding task was to explicate, “in detail what we have so far covered in general terms.”[[99]](#footnote-99) That is, he was to determine the axioms capable of explaining the unity of the sciences, a claim to which he returned in his “blacksmith” analogy. Thus, Descartes’ plan was to find the foundations of the sciences through his piecemeal investigations of particular questions. He began this task with his anaclastic line example in 1626 with his conception of “natural power” and, by 1641, his project had fully matured into the *Meditationes*, what he described as the foundation for his physics.

Schuster, on the other hand, takes another route to claim Descartes dropped his early method. He claimed that, after Descartes’ reflections on the finest example, he began to doubt his early faculty psychology.[[100]](#footnote-100) On Schuster’s reading, Descartes thought the faculty of intuition needed ontological certification and was no longer independently certain.[[101]](#footnote-101) In Rule VIII, Descartes told that his examination of the essence and scope of human knowledge requires an inquiry into the cognitive faculties and objects of knowledge. This reexamination of the faculties, Schuster holds, was taken up in Rule XII, what Schuster called the sequel to the finest example. Although Schuster’s reading of this rule is outside the scope of my interpretation of Rule VIII, I will provide some brief remarks in order to establish a transition between Rules VIII and XII.

On Schuster’s reading, Descartes begins Rule XII by using the rhetoric of the early method, still referencing his early faculty psychology. His aim, however, was to respond to skepticism by providing a physiological explanation of sense perception, which would give ontological credence for his physic-mathematics. For Schuster, by 1626, Descartes had developed his theory of light and optics, drawing on material from Kepler’s *Ad Vitellionem paralipomena* (1604). Descartes’ principal contribution was his physiological explanation of how the image impressed on the eye is mechanistically communicated to the agent’s brain. The impression, on Descartes’ account, was like “wax receiving a seal,” the corporeal object is really changed by the impinging image, which provides a force on the nerves in the eye and an instantaneous impression in the brain matter.[[102]](#footnote-102) On this view, Kepler’s optical geometry preserved the structure of light as it reflects from a luminous object and enters the eye. Descartes’ physiology, moreover, preserved the formed impression on the retina by mechanically communicating it to the agent’s brain. For Schuster, Descartes thought that the agent directly perceived two-dimensional objects, which provides psycho-ontological certification of Descartes’ proposed tools for his physico-mathematics. Descartes can now provide a response to the skeptical attack on mathematics, for he can show that mixed-mathematical disciplines are grounded in nature, for he now directly intuits external objects.[[103]](#footnote-103)

Although I find Schuster’s account of Descartes’ scientific-mathematical project extremely interesting, I do not think Descartes’ transition in Rule VIII results in a detrimental change in his cognitive psychology. In Rules VIII and XII, Descartes claimed that the corporeal faculties were aids to the intellect, a claim that, for Schuster, seems to be in tension with his early formulation of the method.[[104]](#footnote-104) I think, however, that Descartes’ development of the corporeal faculties is a further development of his early method. In the 1619 strata of the rules, Descartes claimed that the “senses’ provide a “fluctuating testimony,” the “imagination” provides a “deceptive judgement,” and “memory is weak and unstable.”[[105]](#footnote-105) By 1628, it was unclear how, for Descartes, the corporeal faculties were to be an aid to the intellect, how they provided a positive contribution to knowledge. Descartes’ response in Rule XII was that the senses provide a one-to-one correspondence with external objects, at least, in some cases, for, contrary to Schuster’s reading, there was no direct perception of corporeal objects. Rather, Descartes thought the senses could deceive, e.g. when “someone has jaundice” or, say, “when our imagination is impaired (as it is in depression) and we think that its disordered images represent real things.”[[106]](#footnote-106) For Descartes, we can err in our sense perceptions because images are depicted in the imagination, and it is the duty of the agent’s intellect to determine when the senses truly depict external objects and when they do not. For instance, Descartes wrote,

We should note here that the intellect can never be deceived by any experience, provided that when the object is presented to it, it intuits it in a fashion exactly

corresponding to the way in which it possesses the object, whether within itself or in the imagination. Furthermore, it must not judge that the imagination faithfully represents the objects of the senses, or that the senses take on the true shapes of things, or in short that external things are just as they appear to be.[[107]](#footnote-107)

In this way, Descartes had an unanalyzed dualism in the *Regulae* where images were not directly known but, rather, copies are first formed in the imagination and, then, the agent must decide whether it is veracious or not.

**5. The Composition of the *Regulae***

Weber’s patchwork thesis, along with Schuster’s revisions, has been the standard for dating the *Regulae* in the literature.[[108]](#footnote-108) Nevertheless, the present thesis places doubt on the principal events that were used to determine approximate dates, which leaves open the question as to whether we should discard the developmental dating of the *Regulae*. I think not, for we can provide alternative reasons that roughly make the same divisions in the text. First, there is reason to hold that Rules I-XI (excluding portions of Rule VIII) were drafted after November 1619. At this time, Descartes had his famous dreams, documented in the *Olympica* and *Cogitationes* *Privatae*, where he told that his aim was to explain the interconnectedness of the sciences with certainty.[[109]](#footnote-109) This aim, in fact, was the aim of Rule I, which, as I have shown, was developed in Rule IV.[[110]](#footnote-110) Moreover, the remaining rules, the general procedure of the method, were written to meet this aim, which provides prima facie reasons to suggest that this material was composed during the 1619-1620 period. In addition, we can, in some sense, isolate Rule VIII from the other rules, for Schuster’s reconstruction of Descartes’ discovery of the anaclastic plausibly suggests that this discovery occurred in 1626 or thereafter, which indicates that, at least, a portion of Rule VIII was drafted at this time.[[111]](#footnote-111) It also seems plausible to hold that the drafts of the “finest example” (the remainder of Rule VIII), its sequel in Rule XII, and the rules after Rule XI, were drafted sequentially, between 1626 and 1628, for this is the assumption of the traditional account and, further, Descartes reported that he was working on his *Histoire de mon espirit*[[112]](#footnote-112)in March 1628 and his *Traité de métaphysique* by the summer of 1629.[[113]](#footnote-113)

1. This was the date given by John Cottingham, Robert Stoothoff, and Ducald Murdoch. See CSM I, 7. In this essay, I use the following abbreviations: AT = René Descartes, *Oeuvres de Descartes*, eds. C. Adam and P. Tannery, 2nd edition, Paris: Vrin, 1964–1974, 11 vols.; CSM = René Descartes, *The Philosophical Writings of Descartes*, trans. J. Cottingham, R. Stoothoff, and D. Murdoch, Cambridge: Cambridge University Press, 1984–1985, 2 vols.; CSMK = René Descartes, *The Philosophical Writings of Descartes*, trans. J. Cottingham, R. Stoothoff, D. Murdoch, and Anthony Kenny, Cambridge: Cambridge University Press, 1991, vol. III.; *Le* *Monde* = René Descartes, *The World and Other Writings*, trans. S. Gaukroger, Cambridge University Press: Cambridge, 1998, pp. 3-75; *L’homme* = Gaukroger, 1998, pp. 99-169; *Dioptrique* = René Descartes, *Discourse on Method, Optics, Geometry, and Meteorology*, trans. by Paul Olscamp, Indianapolis: Hackett, 2001, pp. 65-173; *Les* *Météores* = Olscamp, 2001, pp. 263-361. [↑](#footnote-ref-1)
2. L. J. Beck, *The Method of Descartes: A Study of the Regulae*, Oxford: Oxford University Press, 1952; L. J. Beck, *The* *Metaphysics of Descartes: A Study of the Meditations*, Oxford: Clarendon Press, 1965; Roger Florka, “Problems with the Garber-Dear Theory of the Disappearance of Method,” *Philosophical Studies* 117 (2004), pp. 131-141; Peter Schouls, *The Imposition of Method*, Oxford: Oxford University Press, 1980. [↑](#footnote-ref-2)
3. Descartes began his scientific treatises with assumptions. Some take this as evidence that he resorted to a hypothetical method in his science. For example, see Desmond Clarke, *Descartes’ Philosophy of Science*, Manchester: Manchester University Press, 1982, chapters 1 and 2; Edwin Curley, *Descartes Against the Skeptics*, Cambridge: Harvard University Press, 1978, Chapter 2; Gary Hatfield, “Science, Certainty, and Descartes,” in the *Proceedings of the Biennial Meeting of the Philosophy of Science Association 1988*, vol. 2, East Lansing, Philosophy of Science Association, 1989, pp. 249-262; Olscamp, “Introduction,” p. ix-xxxiv. For an alternative view, see Patrick Brissey, “Descartes and the Meteorology of the*World*,*” Society and Politics*6 (2012), pp. 88-100. Patrick Brissey, “Descartes’ *Discours* as a Plan for a Universal Science,” *STUDIA UBB. PHILOSOPHIA*, 58 (2013), pp. 37-60. [↑](#footnote-ref-3)
4. For instance, Pamela Kraus criticizes Bernard Williams’ *Descartes: The Project of Pure Inquiry* in this manner. See Pamela A. Kraus, “From Universal Mathematics to Universal Method: Descartes’s ‘Turn’ in Rule IV of the *Regulae*,” *Journal of the History of Philosophy* 21 (1983), pp. 59-74. [↑](#footnote-ref-4)
5. For an explanation of type of questions that Descartes pursued in his early philosophy, see John A. Schuster, *Descartes-Agonistes: Physico-mathematics, Method and Corpuscular-Mechanism* 1618-33, Sydney: Springer, 2013, pp. 112-123 (Stevin’s hydrostatic paradox), 124-134 (Beeckman and the law of fall), 167-220 (the anaclastic curve). [↑](#footnote-ref-5)
6. This excludes, for Weber, the project of mathesis universalis in Rule IV-B. [↑](#footnote-ref-6)
7. That is, I have escaped the “cult of method” concerning Descartes’ method. For Schuster’s discussion concerning Cartesian studies, see Schuster, *Descartes-Agonistes*, ch. 6. For his general discussion concerning the social studies of science, see John A. Schuster, *An Introduction to the History and Social Studies of Science*, Open Learning Australia, 1995. [↑](#footnote-ref-7)
8. Stephen Gaukroger, *Descartes: An Intellectual Biography*, Oxford: Clarendon Press, 1995, pp. 84-89, 139-146. Gaukroger and Schuster, “The hydrostatic paradox and the origins of Cartesian dynamics,” *Studies in the History and Philosophy of Science* 33 (2002) 535–572. Also see fn. 5. [↑](#footnote-ref-8)
9. For the dates of Descartes’ composition of the *Regulae*, see Schuster, *Descartes-Agonistes*, pp. 307-345. [↑](#footnote-ref-9)
10. AT X, 399, 429; CSM I, 32, 50-51. [↑](#footnote-ref-10)
11. For a proposal of what Book III would have contained, see Bret J. Lalumia Doyle, “How (Not) to Study Descartes’ *Regulae*,” *British Journal of the History of Philosophy* 17 (2009), pp. 12-20. [↑](#footnote-ref-11)
12. Descartes completed Rules XIII through XVIII. He, however, only provided titles with no commentary for Rules XIX through XXI. Moreover, the *Regulae* was never published during Descartes’ lifetime. He, however, carried the text with him throughout his lifetime, for it was included in the Stockholm Inventory among texts discovered at the time of his death. [↑](#footnote-ref-12)
13. John A. Schuster, “Descartes' *Mathesis Universalis*, 1619-28,” in *Descartes: Philosophy, Mathematics and Physics,* Sussex: Harvester Press, 1980, pp. 51-54. [↑](#footnote-ref-13)
14. Schuster tells that Dr. Richard Serjeantson plans to publish a new edition of the *Regulae*, what is called the Cambridge manuscript. From their correspondence, Schuster informs that the new manuscript is forty percent shorter than the Hanover ms. and Dutch ms. It only contains Rules I-XVI, and, does not contain Weber’s Rule IV-B. He informs, moreover, that, in the Cambridge ms., Rule VIII only contains material on the anaclastic curve and lacks any discussion of the “finest example of all.” What Schuster draws from Serjeantson’s description is that the manuscript was most likely, that is, pending the full publication of the manuscript, drafted after Descartes’ discovery of the anaclastic curve in 1626 and before his description of the tools of universal mathematics in Rules XVII-XXII, rules which, for Schuster, results in the fundamental tension between the quantitative goals of universal mathematics and Descartes’ qualitative procedure in his science. See Schuster, *Descartes-Agonistes*, p. 235, fn. 23 and p. 388, fn. 73. For my purposes, this means that the new manuscript is an early draft, written before the Hanover and Dutch copies. My present interest is whether Descartes’ most mature composition of Rule VIII is coherent with the overall project of the *Regulae*. For this reason, the future publication of the Cambridge ms. does not pose a significant problem for the present thesis. [↑](#footnote-ref-14)
15. See Jean-Paul Weber, *La constitution du texte des Regulae*, Paris: Société d’édition d’enseignement supérieur, 1964, pp. 7ff and pp. 81-108. Crapulli’s Dutch Manuscript, on the other hand, places this material in Rules IV. See Giovanni Crapulli, “Introduction,” in *René Descartes:* *Regulae ad directionem ingenii,* The Hague: Martinus Nijhoff, 1966, pp. xi-xxxiii. [↑](#footnote-ref-15)
16. AT X, 373, 377; CSM I, 19. [↑](#footnote-ref-16)
17. Doyle, “How (Not) to Study Descartes’ *Regulae*;” Kraus, “From Universal Mathematics to Universal Method,” pp. 159-174; Schuster, “Descartes' *Mathesis Universalis*,” pp. 41-96; Weber, *La constitution*, 5ff. [↑](#footnote-ref-17)
18. Marion, *Sur l'ontologie grise de Descartes‬*,second ed., Paris: Vrin, 1981, pp. 55-69; Fredrick Van de Pitte, “The Dating of Rule IV-B in Descartes’s Regulae ad directionem ingenii,” *Journal of the History of Philosophy* 29 (1991), pp. 375-95. Van de Pitte, suggests that the passage of Rule IV-B was most likely drafted during between 1639-1640, when Descartes was working on the *Meditationes*. Also see Jacob Klein, *Greek Mathematical Thought and the Origin of Algebra*, trans. Eva Brann, Cambridge, Massachusetts: MIT Press, 1972, pp. 197ff. He claims that Descartes derived the method from “*mathesis*,” thus linking Rule IV-B to the early rules. [↑](#footnote-ref-18)
19. AT X, 374; CSM I, 16. [↑](#footnote-ref-19)
20. AT X, 359; CSM I, 9; emphasis added. [↑](#footnote-ref-20)
21. Gaukroger, *Descartes*, pp. 74-80. [↑](#footnote-ref-21)
22. Gaukroger, *Descartes*, pp. 80-84; John A. Schuster, *Descartes and the Scientific Revolution, 1618-1634*, 2 vols, Ph.D. Dissertation, Princeton University, 1977, pp. 72-93; [↑](#footnote-ref-22)
23. Gaukroger, *Descartes*, pp. 84-89; Gaukroger and Schuster, “The hydrostatic paradox and the origins of Cartesian dynamics,” pp. 535–572; Schuster, *Descartes and the Scientific Revolution*, pp. 93-111; and Schuster, “Descartes' *Mathesis Universali*,” pp. 51-55. [↑](#footnote-ref-23)
24. Schuster, *Descartes and the Scientific Revolution*, pp. 111-145; Schuster, “Descartes' *Mathesis Universalis*,” pp. 49-51; Gaukroger, *Descartes*, pp. 89-98. [↑](#footnote-ref-24)
25. A. I. Sabra, *Theories of Light: from Descartes to Newton*, Cambridge: Cambridge University Press, 1981, pp. 105-116; Schuster, “Descartes' *Mathesis Universalis*,” p. 58; and Schuster, *Descartes-Agonistes*, pp. 167-220. [↑](#footnote-ref-25)
26. For instance, Popkin provides the date of 1628. See Richard Popkin, *The History of Scepticism: from* Savonarola *to Bayle*, New York: Oxford University Press, 2003, pp.144-145. [↑](#footnote-ref-26)
27. John A. Schuster, “Physico-mathematics and the search for causes in Descartes’ optics, 1619-37,” *Synthese* 185 (2012), pp. 467-469. [↑](#footnote-ref-27)
28. For a description of Descartes’ skeptical dilemma in the late 1620s, see Schuster, *Descartes and the Scientific Revolution*, pp. 373-387. For an alternative perspective, see Richard Popkin, *History of Skepticism*, pp. 143-147. For a description of Descartes’ early reply to skepticism, see Matthew J. Kisner, “Skepticism and the Early Descartes,” *British* *Journal of the History of Philosophy* 13 (2005), pp. 207-32. [↑](#footnote-ref-28)
29. Schuster reconstructs the likely route that Descartes discovered the law of refraction. See John A. Schuster, “Descartes’ *Opticien*: The Construction of the Law of Refraction and the Manufacture of its Physical Rationales, 1618-29,” in *Descartes’ Natural Philosophy*, London: Routledge, 2000, pp. 29-37. See also Schuster, *Descartes-Agonisties*, pp. 167-220. For instance, [↑](#footnote-ref-29)
30. AT X, 392; CSM I, 28. [↑](#footnote-ref-30)
31. AT VII, 58; CSM II, 40. [↑](#footnote-ref-31)
32. As Weber has shown, the first paragraph of Rule VIII is a continuation of Rule VII, which indicates that it is misplaced. See Weber, *La constitution*, pp. 87-91. This local inconsistency, however, is not important for the developmental interpretation. See also Schuster, *Descartes and the Scientific Revolution*, pp. 449-451. [↑](#footnote-ref-32)
33. AT X, 394; CSM I, 29. [↑](#footnote-ref-33)
34. For an interesting explanation of Descartes’ method of reduction, see Daniel Garber, *Descartes Embodied*, Cambridge: Cambridge University Press, 2001, pp. 35-38. [↑](#footnote-ref-34)
35. AT X, 394; CSM I, 29. [↑](#footnote-ref-35)
36. AT X, 394; CSM I, 29. [↑](#footnote-ref-36)
37. AT X, 394, 395; CSM I, 29. [↑](#footnote-ref-37)
38. He provides a version of his proof in Discourse Eight of the *Dioptrique*. See AT VI, 165-196; *Dioptrique*, 127-149. [↑](#footnote-ref-38)
39. Garber additionally holds that the early method did not test false hypotheses. See Daniel Garber, *Descartes’ Metaphysical Physics*, Chicago: University of Chicago Press 1992, pp. 47-48. However, Descartes’ anaclastic line example pursues a false hypothesis, mainly the perspective of a mathematician, (AT X, 397; CSM I, 31), and Descartes explicitly criticizes this approach in Rule I (AT X, 361; CSM I, 10). [↑](#footnote-ref-39)
40. Garber, *Descartes Embodied*, p. 36. Also see Garber, *Descartes’ Metaphysical Physics*, p. 34. [↑](#footnote-ref-40)
41. Garber wrote, “it is not clear to me that one can isolate *one well-defined question* to which Descartes addresses himself in the *Meditations* – *a minimal condition* *required for the method* of the *Rules* to apply” (Garber, *Descartes Embodied*, p. 46; emphasis added). [↑](#footnote-ref-41)
42. See fn. 29. [↑](#footnote-ref-42)
43. Schuster, *Descartes-Agonistes*, pp. 265-299, 307-345. [↑](#footnote-ref-43)
44. Schuster, “Descartes' *Mathesis Universalis*,” p. 58; Schuster, “Descartes’ *Opticien*,” pp. 43-46. [↑](#footnote-ref-44)
45. See fns. 5 and 8. [↑](#footnote-ref-45)
46. AT X, 215. [↑](#footnote-ref-46)
47. Descartes made this claim in the *Olympica*. [↑](#footnote-ref-47)
48. AT X, 359; CSM I, 9. [↑](#footnote-ref-48)
49. AT X, 361; CSM I, 10. [↑](#footnote-ref-49)
50. AT X, 361; CSM I, 10; emphasis added. [↑](#footnote-ref-50)
51. AT X, 360; CSM I, 9; emphasis added. [↑](#footnote-ref-51)
52. AT VI, 2; CSM I, 111; emphasis added. [↑](#footnote-ref-52)
53. Other commentators also hold this position. See Norman Kemp Smith, *Studies in the Cartesian Philosophy*, New York: Macmillan, 1902, pp. 23-24, and L. J. Beck, *The Method of Descartes: A Study of Descartes’ Regulae*, Oxford: Oxford University Press, 1952, pp. 20-22. [↑](#footnote-ref-53)
54. AT X, 374; CSM I, 17. [↑](#footnote-ref-54)
55. AT X, 376; CSM I, 18; emphasis added. For an alternative reading, see Clarke, *Descartes’ Philosophy of Science*, pp. 186-194. [↑](#footnote-ref-55)
56. AT X, 374; CSM I, 17. [↑](#footnote-ref-56)
57. AT X, 394; CSM I, 28-29. [↑](#footnote-ref-57)
58. AT X, 394; CSM I, 29; emphasis added. [↑](#footnote-ref-58)
59. AT X, 361; CSM I, 10. [↑](#footnote-ref-59)
60. See Schuster, *Descartes-Agonistes*, pp. 603-617. [↑](#footnote-ref-60)
61. For instance, Garber writes, “the intuitive step remains profoundly obscure” (Garber, *Descartes’ Metaphysical Physics*, p. 36). [↑](#footnote-ref-61)
62. Garber, *Descartes’ Metaphysical Physics*, p. 34. See also Garber, *Descartes Embodied*, p. 36. [↑](#footnote-ref-62)
63. Garber, *Descartes’ Metaphysical Physics*, p. 34. [↑](#footnote-ref-63)
64. Schuster, “Descartes’ *Opticien*,” p. 44 and Schuster, *Descartes-Agonistes*, pp. 216-217. See also Gaukroger, *Descartes*, p. 155. [↑](#footnote-ref-64)
65. Schuster, “Descartes’ *Opticien*,” p. 5. [↑](#footnote-ref-65)
66. Moreover, in Rule IX, Descartes was proposing a different question: “whether a natural power can travel instantaneously to a distant place.” See AT X, 402; CSM I, 34. [↑](#footnote-ref-66)
67. AT X, 395; CSM I, 29; emphasis added. Descartes was most likely aware of Kepler’s physiology of sight in *Ad Vitellionem paralipomena* (1604) by 1619. See Schuster, “Descartes’ *Opticien*,” pp. 22-28. [↑](#footnote-ref-67)
68. This, in fact, was Descartes’ strategy in *L’homme* (1633) and *Dioptrique* (1637). See AT VI, 83-84; *Dioptrique*, 101; AT XI, 142-151; *L’homme*, 118-124. [↑](#footnote-ref-68)
69. AT X, 395; CSM I, 29. [↑](#footnote-ref-69)
70. AT X, 412; CSM I, 40. [↑](#footnote-ref-70)
71. AT X, 412-413; CSM I, 40; emphasis added. [↑](#footnote-ref-71)
72. Also see M. Fichant, *Science et métaphysique chez Descartes et Leibniz*, Paris, PUF, 1998, p. 19. I thank the anonymous referees of the *Journal of Early Modern Studies* for comments on the broader implications of Descartes’ intuition in the anaclastic line example. [↑](#footnote-ref-72)
73. AT X, 395; CSM I, 29. [↑](#footnote-ref-73)
74. Schuster, *Descartes and the Scientific Revolution*, pp. 373-430. [↑](#footnote-ref-74)
75. AT X, 396-397; CSM I, 30. [↑](#footnote-ref-75)
76. AT X, 396; CSM I, 31. [↑](#footnote-ref-76)
77. Garber, *Descartes’ Metaphysical Physics*, p. 41; emphasis added. [↑](#footnote-ref-77)
78. Schuster, *Descartes and the Scientific Revolution*, p. 457. [↑](#footnote-ref-78)
79. For an alternative reading, see Gaukroger, *Descartes*, pp. 155-156. [↑](#footnote-ref-79)
80. He defined “intuition” as an immediate perception of a self-evident truth (AT X, pp. 407, 365; CSM I, pp. 37, 12) and “deduction” as a proposition necessarily inferred from self-evident premises (AT X, p. 369; CSM I, p. 15). These claims gave rise to the reductive and deductive stages of the method, for certainty is secured, first, by reducing obscure questions to simple propositions in order to discover an intuition and, second, by making necessary deductions, known answers to the complex questions. [↑](#footnote-ref-80)
81. AT X, 396; CSM I, 31. [↑](#footnote-ref-81)
82. AT X, 363-364; CSM I, 11-12. [↑](#footnote-ref-82)
83. AT X, 395; CSM I, 29. [↑](#footnote-ref-83)
84. AT X, 368; CSM I, 14. [↑](#footnote-ref-84)
85. AT X, 390; CSM I, 26. [↑](#footnote-ref-85)
86. AT X, 382-383; CSM I, 22. [↑](#footnote-ref-86)
87. He also made this point in the *Discours*. See AT VI, 21-22, 30-31; CSM I, 121-122, 125-126. [↑](#footnote-ref-87)
88. AT X, 397; CSM I, 31. [↑](#footnote-ref-88)
89. AT X, 397; CSM I, 31. [↑](#footnote-ref-89)
90. AT X, 392; CSM I, 27-28; emphasis added. For an alternative interpretation, see Schuster, *Descartes and the Scientific Revolution*, p. 457. [↑](#footnote-ref-90)
91. AT X, 397-398; CSM I, 31; emphasis added. [↑](#footnote-ref-91)
92. Garber, *Descartes’ Metaphysical Physics*, p. 42. [↑](#footnote-ref-92)
93. Garber, *Descartes’ Metaphysical Physics*, p. 42. [↑](#footnote-ref-93)
94. Garber, *Descartes’ Metaphysical Physics*, p. 40. [↑](#footnote-ref-94)
95. Garber, *Descartes’ Metaphysical Physics*, pp. 54-55. [↑](#footnote-ref-95)
96. AT VI, 17-18, 30-31; CSM I, 119, 126. [↑](#footnote-ref-96)
97. AT VI, 22; CSM I, 122. Descartes provides a similar explanation in the *Meditationes*. See AT VI, 17; CSM II, 12. [↑](#footnote-ref-97)
98. AT VI, 13-14; CSM I, 117. [↑](#footnote-ref-98)
99. AT X, 392; CSM I, 28. [↑](#footnote-ref-99)
100. Schuster provides three reasons why Descartes dropped his method: (1) Descartes’ physico-mathematics required rigorous quantitative proof, while Descartes’ science, in practice, often required to quantitative explanations; (2) Descartes’ theory of perception only intuits two-dimensional patterns, while nature contains three-dimensions; (3) his theory of perception necessitated that his geometry use only lines and rectangles (two-dimensional patterns), while his higher-order equations would need circles and higheriorder curves. See Schuster, *Descartes-Agonistes*, pp. 334-346. In this paper, I only take up Schuster’s claim that Descartes attempted to justify his faculty of intuition through the O-P-P nexus. I, however, think his other claims can be explained. First, Descartes’ theory of deduction did not restrict proof to mathematics. For instance, Descartes’ holds that “everyone can intuit that he exists, that he is thinking,” and he can deduce “rational soul is not corporeal” and “I am, therefore God exists” (AT X, 368, 390, 422-423; CSM I, 14, 26, 46). Second, I am not convinced that Descartes only perceived two-dimensional objects in 1628, for he refers to his example in Rule XII as a metaphor (AT X, 413; CSM I, 20-41). [↑](#footnote-ref-100)
101. Schuster, *Descartes and the Scientific Revolution*, p. 447. [↑](#footnote-ref-101)
102. Descartes does not specify whether the impression is made on the pineal gland or the folds in the brain. For his physiology of the brain, see AT XI, 170-202; *L’homme* pp. 142-169. [↑](#footnote-ref-102)
103. Schuster, *Descartes-Agonistes*, pp. 314-320. [↑](#footnote-ref-103)
104. AT X, 398, 410-411; CSM I, 32, 39. [↑](#footnote-ref-104)
105. AT X, 368, 408; CSM I, 14, 38. [↑](#footnote-ref-105)
106. AT X, 422-423; CSM I, 46-47. [↑](#footnote-ref-106)
107. AT X, 423, CSM I, 47. [↑](#footnote-ref-107)
108. Schuster relies heavily on Weber’s account. [↑](#footnote-ref-108)
109. For an explanation of this content, see John R. Cole, *The Olympian Dreams and Youthful Rebellion of René Descartes*, Chicago: University of Illinois Press, 1992; Henri Gouhier, *Les premières pensées de Descartes*, Paris: Vrin, 1958; Gregor Sebba, *The Dream of Descartes*, ed. by Richard a Watson, Carbondale: Southern Illinois University Press, 1987. [↑](#footnote-ref-109)
110. There are also similarities between Descartes’ 1619 works (his notebook (containing his *Olympica*, *Experimenta*, *Parnassus*, *Democritica*, *Praeambula*), Leibniz’s notes on this material in *Cogitationes* *privatae*, his *Studium* *bonae* *mentis*, and Rules I-XI of the *Regulae*. [↑](#footnote-ref-110)
111. See fn. 29. [↑](#footnote-ref-111)
112. March 30, 1628, Balzac to Descartes, AT I, 570. [↑](#footnote-ref-112)
113. July 18, 1629 to Gibieuf, AT I, 17; CSMK III, 5-6; November 25, 1630 to Mersenne, AT I, 181-183; CSMK III, 29. [↑](#footnote-ref-113)