

# The peculiar fate of human reason. Reflections on Kant's concept of astronomy

Rudolf Meer<sup>1\*</sup>

<sup>1</sup>University of Graz, Universitätsplatz 3, 8010 Graz, Austria

**Abstract.** The question whether and how Kant can introduce a concept of reason which is compatible with his critical claims of enlightenment is a perennial challenge. This question implies the problem of how reason can be the supreme touchstone of all rights and remedies without being affected by Kant's despotism-reproach (*WA*, AA 08: 41). To defend Kant's concept of reason, I reflect on the astronomy example as introduced in the fourth antinomy. With reference to Jean Jacques Dortous de Mairan, Kant considers a dispute between two astronomers concerning the question whether the moon turns on its own axis or not. Based on his own *perspective resolution* (i.e. the distinction between the perspective of the sun and the perspective of the earth), Kant presents his distinction between theoretical and practical philosophy. Simultaneously, he develops the possibility of understanding reason in its regulative use as well as in its historical dimension. Consequently, Kant refers to astronomy again in the "Appendix to the Transcendental Dialectic", and explains the historical progress of its underlying assumptions, i.e. the circular, elliptical, hyperbolic and parabolic motion of the courses of planets around the sun. From Kant's point of view, these theories of movement build *foci imaginarii* and, for this reason, they are transformable, as the history of astronomy has shown. Regarding these astronomy examples, I argue that reason does not build an Archimedean Point but can fulfil its function as the highest judge in a regulative use.

**Keywords:** astronomy, regulative use of reason, *focus imaginarius*, radical enlightenment, fate, antithetic

## 1 Introduction

Immanuel Kant begins the *Critique of Pure Reason* in the first edition of 1781 with the following statement: "Human reason has the peculiar fate [...] that it is burdened with questions which it cannot dismiss, since they are given to it as problems by the nature of reason itself, but which it also cannot answer, since they transcend every capacity of human reason" (*KrV*, A VII; Kant, 1998a, p. 99). It is remarkable that this statement does not simply end the book as a result of the critical investigation it represents, but serves as its starting point instead. The "consciousness of my ignorance", Kant explains in the "Doctrine of

---

\* Corresponding author: [rudolf.meer@uni-graz.at](mailto:rudolf.meer@uni-graz.at)  
ORCID: 0000-0001-5349-9210

Method”, “should not end my inquiries, but is rather the proper cause to arouse them” (*KrV*, A 758 / B 786; Kant, 1998a, p. 652).<sup>1</sup>

Kant reformulates, first, enlightenment’s criticism of throne and altar (Gay, 1977, pp. 127-128) by defining humans as rational beings who are burdened by questions which the apparent monopoly of knowledge and the claims of power held by these political and religious authorities are incapable of answering (*WA*, AA 08: 41). Secondly, Kant does not understand Enlightenment merely as a stimulation to gain more knowledge, more progress and more emancipation, but as a critique of reason, e.g. of its boundaries and possibilities. Therefore, Kant’s critical demand is also directed against a specific understanding of enlightenment and installs it as a self-reflective process (Hutter, 2009a; 2009b, p. 72; Allison, 2012, p. 230; Ferrone, 2013, pp. 28-29; La Rocca, 2011, pp. 103-104).

This paper addresses the question whether and how Kant can introduce a concept of reason which is compatible with his critical claims of enlightenment. That is, how can reason be the supreme touchstone of all rights and claims without being affected by Kant’s reproach of despotism (*WA*, AA 08, 41)? This question has its starting point in the dilemma that a conception of reason which is too weak does not meet its own requirements, but a too strong conception of reason is exposed to the reproach that reason is a new despot which merely replaces the old ones.<sup>2</sup>

To vindicate Kant’s concept of reason as the highest judge without being an *intellectus archetypus*, I will reflect on the ‘astronomy’ examples, as introduced in the fourth antinomy and the “Appendix to the Transcendental Dialectic”. In doing so, it can be shown that this and similar accusations undermine the philosophical standard of Kant’s argument. Indeed, Kant introduces in the *Critique of Pure Reason* a concept of reason which represents the starting point for his philosophy of enlightenment, and thus, for a *radical enlightenment*.

## 2 To vindicate reason

In critical philosophy, Kant’s most important instances<sup>3</sup> to explain his specific concept of reason are taken from astronomy (*KrV*, B XVI; *KrV*, A 258 / B 313; *KrV*, A 461 / B 489; *KrV*, A 662-663 / B 690-691; *Prol*, AA 04: 320; *MAN*, AA 04: 469-471; see also: *KpV*, AA 05: 161; *SF*, AA 07: 83; *IaG*, AA 08: 18). This is a fact which links Kant’s theory with other philosophical theories of the early modern era (Brandt, 2007, pp. 223-247) but its specific elaboration makes his theory unique.

### 2.1 A dispute about nothing

In the concluding remarks to the “Antithetic of Pure Reason” and with reference to M. de Mairan, Kant considers a dispute between two astronomers which arises “from a similar difficulty” (*KrV*, A 460 / B 488; Kant, 1998a, p. 493) as the conflict in the fourth

<sup>1</sup> In this sense, Kant overcomes a philosophical tradition characterised by Plato.

<sup>2</sup> Exemplarily, Hindrich (2009, p. 51) argues in this manner when he writes: “This is the entire problem of any enlightenment of Enlightenment. Because of their inability to justify the legal procedure itself, the reflections of criticism end up denying the lawful claims of Enlightenment thinking” (Hindrich, 2009, p. 62; see also 2004, pp. 97-121). In this sense, reason is always a predetermined thinking, and therefore, it cannot be justified. This circularity (O’Neill, 1996, p. 207) leads to the fact that reason is in the same position as the criticised despots “The principle of criticism is not a beginning (*principium*) but the end of critical thinking” (Hindrich, 2009, p. 52). In the same way O’Neill (1992; 1996, p. 207) argues, when she writes with regard to Kant’s concept of reason, that a reasonable justification is circular because it would presuppose what has to be proven, and an unreasonable justification is not a justification.

<sup>3</sup> Notice that Kant distinguishes in the *Metaphysics of Moral* (*MS*, AA 06: 479) between *examples* and *instances*.

antinomy, i.e. the “choice of a standpoint” (*KrV*, A 460 / B 488; Kant, 1998a, p. 493). “One inferred, namely, that the moon turns on its axis because it constantly turns the same side toward the earth; the other, that the moon does not turn on an axis, just because it constantly turns the same side toward the earth” (*KrV*, A 461 / B 489; Kant, 1998a, p. 494). In this instance, two aspects are especially important: First, in this conflict a contradiction – the moon turns on its axis versus the moon does not turn on its axis – is gained from one and the same “ground of proof” (*KrV*, A 459 / B 487; Kant, 1998a, p. 493). Both positions are inferred, based on the fact that the moon constantly turns the same side toward the earth. That means, thesis and antithesis take into account that it is impossible to see the far side of the moon from the earth.<sup>4</sup> Second, it can be shown that in the dispute between the two astronomers both inferences have their validity. Kant writes: “Both inferences were correct, depending on the standpoint taken when observing the moon’s motion” (*KrV*, A 461 / B 489; Kant, 1998a, p. 495). From a contingent perspective to the moon, for example the perspective from the earth to the moon, and based on the fact that we always see the same side of the moon, we have to infer that the moon does not turn on its own axis. By contrast, from an absolute perspective to the moon and the earth, as we have for example from the sun, and based on the fact that the moon constantly turns the same side toward the earth, we have to infer that the moon turns on its own axis. Thereby, the moon needs for the rotation on its axis as long as for the rotation around the earth (about twenty seven days and seven hours), and turns therefore constantly the same side toward the earth.

Depending on the standpoint, it is possible to infer from one and the same ground of proof to the thesis or antithesis without arriving at an “analytical opposition” (*KrV*, A 504 / B 532; Kant, 1998a, p. 518). Both standpoints build a “dialectical opposition” (*ibid.*) in which the contingent perspective from the earth as well as the absolute perspective from the sun are each valid in their own specific way.

Thus, the dispute between these astronomers is based on an inaccurate condition, this being that the differentiation between the two possible standpoints is lacking. The thesis-position as well as the antithesis-position “are disputing about nothing” (*KrV*, A 501 / B 529; Kant, 1998a, p. 516), because they do not have in their apagogical proofs “sound arguments (*tüchtige Beweisgründe*)” (*KrV*, A 501 / B 529; Kant, 1998a, p. 516).

Based on the ‘perspective’ resolution, Kant presents his distinction between theoretical and practical philosophy. Simultaneously, he develops the possibility of understanding reason in its regulative use as well as in its historical dimension.

## 2.2 Reason as a *focus imaginarius*

In the “Appendix to the Transcendental Dialectic”, Kant again introduces an example from astronomy. His aim here is to explain “the systematic in cognition, i.e. its interconnection based on one principle” (*KrV*, A 645 / B 673; Kant, 1998a, p. 591), or rather, “a whole of cognition ordered according to principles” (*MAN*, AA 04: 467; Kant, 2004b, p. 3). In this sense, he writes in the “Transcendental Doctrine of Method”: “I understand by a system, however, the unity of the manifold cognitions under one idea” (*KrV*, A 832 / B 860; Kant, 1998a, p. 691).<sup>5</sup> It is important to note that the systematic in cognition gained through these

<sup>4</sup> Kant identifies this “odd contrast” (*KrV*, A 459 / B 487; Kant, 1998a, p. 493) also in the fourth antinomy. Based on one and the same ground of proof – because the whole of past time includes within itself the series of all conditions – the thesis-position infers that there is a necessary being and the antithesis-position infers that there is no necessary being (*KrV*, A 459 / B 487).

<sup>5</sup> In the first part of the “Appendix”, the unity of the manifold cognitions under an idea (*focus imaginarius*) is developed by means of the “hypothetical use of reason” (*KrV*, A 647 / B 675; Kant, 1998a, p. 592), i.e. the principle of homogeneity (unity), specification (manifoldness) and continuity (affinity).

principles is not an *Archimedean point* but is governed by a historical change and development. Kant illustrates this with regard to astronomy, when he writes: “Hence if, e.g., the course of the planets is given to us as circular through a (still not fully corrected) experience, and we find variations, then we suppose these variations to consist in an orbit that can deviate from the circle through each of an infinity of intermediate degrees according to constant laws; i.e., we suppose that the movements of the planets that are not a circle will more or less approximate to its properties, and then we come upon the ellipse. The comets show an even greater variety in their paths, since (as far as observation reaches) they do not ever return in a circle; yet we guess at a parabolic course for them, since it is still akin to the ellipse and, if the major axis of the latter is very long, it cannot be distinguished from it in all our observations” (*KrV*, A 662-663 / B 690-691; Kant, 1998a, p. 601). The circle, the ellipse, and the parabola are created from different conic sections. If the cone is sliced parallel to the base area, you gain a circle. If the angle of incidence is changed, this leads to an ellipse, and to a parabola – provided that all three curves are in a continuous relationship to each other and can be gained through a continuous deformation. In these theories of the movements of the celestial bodies the cone is the binding geometric link by means of the theories of movement standing in a continuous relationship. In turn, this continuity is the condition for a theory of a continuous process in the history of astronomy, as Kant explains.

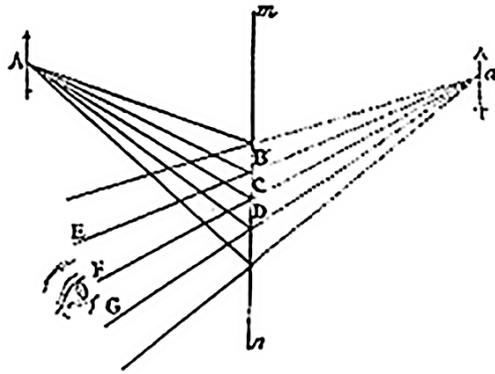
A naive, incomplete and “still not fully corrected” (*KrV*, A 662 / B 690; Kant, 1998a, p. 601) experience teaches that all celestial bodies have a circular movement. Beginning with the school of Pythagoras to Ptolemaios and Copernicus, this was the position taken on interpreting the movement of planets, and this opinion even survived the change from the geocentric to the heliocentric model. If there are variations or inconsistencies in our observations of the circular movement, then, based on the law of continuity, we suppose that the movement of the celestial bodies is not circular but elliptical. The properties of an ellipse are “more or less approximate to” (*ibid.*) those of a circle. For this reason, it is possible to transform a circle into an ellipse through an “infinity of intermediate degrees” (*ibid.*), i.e. a continuous transformation. This is Kepler’s point of view; he argues that the celestial bodies move through elliptical orbits around the sun, as the first *law of Kepler* determines.

Compared with the planets, the movement of the comets shows an even greater variety of paths. As far as observation reaches, it is shown that they “do not ever return in a circle” (*ibid.*). For this reason and based on the affinity between ellipse and parabola, it is necessary to transform the theory of the elliptic movements of celestial bodies into a parabolic course. If the big axis of the ellipse is extended, then the ellipse cannot be distinguished from a parabola in the observation.

Knowledge of these celestial bodies and their movements in the form of circular, elliptical, and parabolic courses around the sun is gained on the basis of the *hypothetical use of reason*. This means that all three theories of the movement of celestial bodies are developed from “several particular cases” (*KrV*, A 646 / B 674; Kant, 1998a, p. 592), derived from the *field of possible experience*. In the course of this, these particular cases are tested by a general rule “to see if they flow from it” (*ibid.*). If all particular cases can be explained by this rule, “then the universality of the rule is inferred, including all subsequent cases, even those that are not given in themselves” (*KrV*, A 647 / B 675; Kant, 1998a, p. 592). In this sense, all theories of the movement of the celestial bodies, i.e. the circle, the ellipse and the parabola, build a thought-entity which Kant terms the *focus imaginarius*. Based on this, the observation has a systematic context; from this principle all diversities can be explained.

What Kant has in mind becomes particularly clear through the so-called *looking glass metaphor*, which Kant borrows from Newton (*KrV*, A 644 / B 672). Using this metaphor, Newton describes a specific constellation of observing an object. Thereby an “Object seen by Reflexion or Refraction, appears in that place from whence the Rays after their last

Reflexion or Refraction diverge in falling on the Spectator's Eye" (Newton, 1952, p. 18). Figure 9 of the "Opticks" illustrates Newton's approach:



In this sketch, the object (A) is located in the background of the spectator (E, F, G). He or she sees this object through a reflection (B, C, D) in the looking glass (m, n). Thereby, the object appears not to be in its proper place (A) to the eye of the spectator, but behind the glass at (a). The rays AB, AC, AD, which flow from one and the same point of the object (A), after their reflection made in B, C, D, diverge in going from the glass to E, F, G. These rays create the image in the eyes as if they had come from the object behind the glass (a), meaning without the interposition of the looking glass (Newton, 1952, p. 18).

Kant interprets the object (A) as the sensible object. This object is given through affection in the forms of intuition, space and time, and is therefore an object "in the field of possible empirical cognition" (*KrV*, A 644 / B 672; Kant, 1998a, p. 591). It is important to notice that the spectator's eye cannot see this object directly; it is not given as a thing in itself. In Kant's interpretation of figure 9 of Newton's "Opticks", the looking glass symbolises this mediated relationship between concepts of understanding and appearances. In addition to this mediated constitution, Kant interprets the object (a) as merely a thought-entity, i.e. as "an object lying outside the field of possible empirical cognition" (*KrV*, A 644 / B 672; Kant, 1998a, p. 591). Thereby, it is a *transcendental illusion*, if the spectator believes that the "lines of direction were shot out" (*ibid.*) from the object behind the mirror. It is transcendental because it "is a natural and unavoidable illusion" (*KrV*, A 298 / B 354; Kant, 1998a, p. 386; see also: *KrV*, A 669 / B 697; *KrV*, A 743 / B 771) and has therefore in the system of reason an immanent function as a *focus imaginarius*. The specific function of the *focus imaginarius* is to order the cognition according to a principle. This means the object behind the mirror is an illusion, but an illusion through which alone the spectator can create a systematic unity of the manifoldness of empirical cognition.

In the words of the analogy, all the theories of the movement of celestial bodies – circle, ellipse, and parabola – build objects behind the looking glass (a). They are ideas and therefore not perceptible in the *field of experience* (A). In contrast to the categories, they are not constitutive but regulative principles. As regulative principles, they have an influence on the investigated objects in the field of experience. These theories are necessary for the observer to gain a systematic framework for empirical research.

Based on this necessity of the regulative principles, Kant expands the already explained historical progress in astronomy when he writes as follows: "Thus under the guidance of those principles we come to a unity of genera in the forms of these paths, but thereby also further to unity in the cause of all the laws of this motion (gravitation); from there we extend our conquests, seeking to explain all variations and apparent deviations from those rules on the basis of the same principle; finally we even add on more than experience can ever

confirm, namely in accordance with the rules of affinity, even conceiving hyperbolic paths for comets in which these bodies leave our solar system entirely and, going from sun to sun, unite in their course the most remote parts of a world system, which for us is unbounded yet connected through one and the same moving force” (*KrV*, A 663 / B 691; Kant, 1998a, p. 601). Under the guidance of the principles of homogeneity, specification and continuity, it is possible to conclude from the particular empirical cases a “unity of genera in the forms of these paths” (*KrV*, A 663 / B 691; Kant, 1998a, p. 601) and the “unity in the cause of all the laws of this motion (gravitation)” (*ibid.*). To this extent, it must be underlined that this is a conclusion which is beyond all experience. Based on this unity, Newton deduces Kepler’s laws of planetary motion. By means of the law of gravitation as *focus imaginarius*, it is in addition possible to imagine hyperbolic paths of celestial bodies. In such hyperbolic curves, the comets leave the solar system entirely and move from sun to sun. Thereby, they move to remote *parts of a world system* “which for us is unbounded yet connected through one and the same moving force” (*ibid.*).

### 3 Reason and enlightenment. Conclusion

Kant develops in the *Critique of Pure Reason* a concept of reason, which is compatible with his critical claim of enlightenment. Reason is not a faculty, which is given in any way<sup>6</sup> but requested from all rational beings. The purpose is to reflect the manifoldness of knowledge and to gain new insights.

Human beings are free and self-determined because they accept that reason is not an *Archimedean point* but can deceive and question itself. Therefore, reason does not replace one power through another one. Reason differs from other despots because it does not have a “dictatorial authority” (*KrV*, A 738 / B 766; Kant, 1998a, p. 643). Kant writes: “Reason must subject itself to critique in all its undertakings, and cannot restrict the freedom of critique through any prohibition without damaging itself and drawing upon itself a disadvantageous suspicion” (*ibid.*).

The peculiar fate of human reason – that it is burdened with questions which it cannot answer – offers the possibility of a self-reflected thinking. Merely through this reflection, it is possible to establish a logical connection to our knowledge (*KrV*, A 508-510 / B 536-538; *KrV*, A 643-544 / B 671-672; *KrV*, A 669-670 / B 697-698). Through the critique of illusion, i.e. through the inferences of the second book of the “Transcendental Dialectic”, reason gains a legitimate understanding of itself (Pissis, 2012, p. 63). In this way, reason is inevitable and not circular. Those who maintain the opposite are inconsistent, because they have already used the court of reason to abolish it.

In this sense, Kant’s critique of reason does not lead to a *farewell to reason*. In fact, “freedom in thinking signifies the subjection of reason to no laws except those which it gives itself; and its opposite is the maxim of a lawless use of reason” (*WDO*, AA 08: 145; Kant, 1996a, p. 14). Humans are enlightened and self-determined, if they are able to *make use of their own understanding* without guidelines from throne and altar although they cannot answer all burdened questions.

### References

- Allison, H.E., 2012. *Essays on Kant*. Oxford: Oxford University Press.  
 Brandt, R., 2007. *Die Bestimmung des Menschen*. Hamburg: Meiner.

<sup>6</sup> For the historical dimension of Kant’s concept of reason see Hessbrüggen-Walter (2004).

- Enskat, R., 2008. *Bedingungen der Aufklärung. Philosophische Untersuchungen zu einer Aufgabe der Urteilskraft*. Weilerswist: Velbrück.
- Ferrone, V., 2013. *Die Aufklärung – philosophischer Anspruch und kulturgeschichtliche Wirkung*. Bonn: Bonn University Press.
- Gay, P., 1977. *The Enlightenment. An Interpretation. Volume I*. New York: Norton.
- Hessbrüggen-Walter, S., 2004. *Die Seele und ihre Vermögen: Kants Metaphysik des Mentalen in der Kritik der reinen Vernunft*. Paderborn: Mentis.
- Hindrich, G., 2004. Warum Kant heute? Zur Kantforschung in Kants zweihundertstem Todesjahr. *Philosophische Rundschau*, 51, pp. 97-121.
- Hindrich, G., 2009. Die aufgeklärte Aufklärung. In: H. Klemme, ed. 2009. *Kant und die Zukunft der europäischen Aufklärung*. Berlin & New York: de Gruyter, pp. 43-67.
- Hutter, A., 2009a. *Das Interesse der Vernunft. Kants ursprüngliche Einsicht und ihre Entfaltung in den transzendentalphilosophischen Hauptwerken*. Hamburg: Meiner.
- Hutter, A., 2009b. Kants Projekt einer Metaphysik der Aufklärung. In: H. Klemme, ed. 2009. *Kant und die Zukunft der europäischen Aufklärung*. Berlin & New York: de Gruyter, pp. 68-81.
- Kant, I., 1984. *The Conflict of the Faculties*. Translated and edited by M.J. Gregor and R. Anchor. Cambridge: Cambridge University Press.
- Kant, I., 1996a. *An Answer to the Question: What is Enlightenment?* Translated and edited by M.J. Gregor and A.W. Wood. Cambridge: Cambridge University Press.
- Kant, I., 1996b. *The Metaphysics of Moral*. Translated by A.W. Wood. Cambridge: Cambridge University Press.
- Kant, I., 1998a. *Critique of Pure Reason*. Translated and edited by P. Guyer and A.W. Wood. Cambridge: Cambridge University Press.
- Kant, I., 1998b. *Critique of Practical Reason*. Translated and edited by P. Guyer and A.W. Wood. Cambridge: Cambridge University Press.
- Kant, I., 2004a. *Prolegomena to Any Future Metaphysics*. Translated and edited by G. Hatfield. Cambridge: Cambridge University Press.
- Kant, I., 2004b. *Metaphysical Foundations of Natural Science*. Translated and edited by M. Friedman. Cambridge: Cambridge University Press.
- Kant, I., 2012. *What Does It Mean to Orient Oneself in Thinking*. Translated by A.W. Wood. Cambridge: Cambridge University Press.
- Kant, I., 2013. *Idea for a Universal History with a Cosmopolitan Purpose*. Translated by A.W. Wood. Cambridge: Cambridge University Press.
- La Rocca, C., 2011. Aufklärung und Formen der Rationalität. Kant und die Vernunft als Zweck. In: L. Cataldi Madonna and P. Rumore, ed. 2011. *Kant und die Aufklärung. Akten der Kant-Tagung in Sulmona, 24.-28. März 2010*. Zürich & New York: Olms.
- Newton, I., 1952. *Opticks: Or a Treatise of the Reflections, Refractions, Inflections and Colours of Light*. Hildesheim & New York: Olms.
- O'Neill, O., 1992. Vindicating Reason. In: P. Guyer, ed. 1992. *Cambridge Companion to Kant*. Cambridge & New York: Cambridge University Press, pp. 95-115.
- O'Neill, O., 1996. Aufgeklärte Vernunft. Über Kants Anti-Rationalismus. In: K.-O. Apel und M. Kettner, ed. 1996. *Die eine Vernunft und die vielen Rationalitäten*. Frankfurt am Main: Suhrkamp, pp. 206-226.
- Pissis, J., 2012. *Kants Transzendente Dialektik*. Berlin: de Gruyter.