

WHAT IS KANT'S JUSTIFICATION OF DEDUCTION?
A PROGRAM FOR READING THE *CRITIQUE OF PURE REASON*
BASED ON THIS QUESTION

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Abstract. Commentators often debate the status of formal logic in the *Critique of Pure Reason*. They ask if Kant takes the laws of formal logic to be normative (telling us how we ought to think) or constitutive (denying formally invalid mental acts the status of thoughts). However, at a deeper level, commentators also ask whether Kant in fact justifies the science of formal logic in the *Critique*. The consensus, namely of Huaping Lu-Alder and Tyke Nunez, is that Kant not only cannot justify this science, but that the impossibility of doing so speaks in his favor. Nunez argues that Kant wisely recognizes the “logocentric predicament”, meaning that any proof of the necessity the laws of formal logic must rely on those same laws. Therefore, there can be no justification of the science of logic, as the science of the form of rational thought, in the *Critique*. I respond that this line of argument dangerously misinterprets the *Critique* in terms of 1) its relation to the Leibnizian tradition, 2) its internal argumentation, and 3) its overall significance. I argue instead that we must understand the *Critique* as, at heart, an entirely novel justification of the laws of formal logic and of logical necessity. First, in terms of Kant's relation to the Leibnizians, I argue that the pre Kantian metaphysical tradition was intrinsically concerned with justifying the laws of logic. It wanted to show by this what it means to be a rational animal. For Kant, the virtue of the Leibnizians (especially Wolff) lay in making this effort systematically complete. Yet this systematization simultaneously demonstrated its fatal circularity. Wolffian metaphysics presupposed the logical laws that it justified. Therefore, Kant recognized that this logocentric predicament condemned it to failure, and he intended his *Critique* to justify the laws of logic in a novel way. Second, I argue that this interpretation makes good sense of the argumentation in the *Critique*. For Kant does not, like the Leibnizians, try to *derive* rules of thinking from ontological laws, but instead *transcendentally reflects* on the logical principles of *how we try to prove anything at all*. This is why he lists singular, infinite, categorical, hypothetical, and disjunctive judgments, along with their modality, in the Metaphysical Deduction: these are the essential elements of how we actively prove thoughts to be true or false. Moreover, this helps us understand Kant's need for both the Transcendental Analytic and the Transcendental Dialectic. The former argues that we must be able to prove our thoughts true or false and derives transcendentally ideal principles of nature from that argument. The latter then proves that only cognition

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inherent to experience of nature is formally valid. Thus, by “bounding pure reason”, Kant demonstrates that we can justify logical necessity only for objectively valid cognition. This ‘bounding’ is his novel justification of the laws of logic and the science of formal logic based on them. It means that we *autonomously* constitute the logical structure of science qua science. This, I argue, is the significance of the *Critique*.

Keywords: Kant, deduction, laws of logic, rules of thinking, valid cognition.

INTRODUCTION: THE PROBLEM OF KANT’S SCIENCE OF LOGIC AND THE JUSTIFICATION OF DEDUCTION

In recent discussions of Kant’s *Critique of Pure Reason*, a controversial issue has been whether Kant justifies his notion that pure general (or formal) logic is an apodictic science, i.e., “the science that exhaustively presents and strictly proves nothing but the formal rules of all thinking (whether this thinking be empirical or *a priori*, whatever origin or object it may have, and whatever contingent or natural obstacles it may meet with in our minds)” (Bix). The question is whether Kant in the *Critique* feasibly argues that his formal logic is indeed the science of the formal rules of *all possible rational thought*. This would be a striking thing to argue for, let alone to claim, especially given the indefinite amount of possible logics that human beings seem to be able to construct. This question is intimately joined to the issue of whether or not Kant’s Table of Judgments (A70/B95), which ostensibly gives the moments of all rational thought, is complete, and how Kant argues for its completeness. For if the Table is complete, and it does represent the basic moments of all rational thought, then formal logic can be established as such a science. On the one hand, some commentators, including Huaping Lu-Adler and Tyke Nunez, argue that Kant is in no position to offer “definitive accounts of how the Table of Judgments is indeed complete and how the Table of Categories may be specifically generated from it.”¹ On the other hand, however, others, like Michael Wolff and Paul Natterer, argue that Kant gives a plausible “deductive”² proof of the completeness of the Table of Judgments and, consequently, of pure general logic as the science of the formal rules of all thinking. In fact, Michael Wolff argues that Kant gives his proof in the short passage from A67/B92 to A70/B95. This section includes the single paragraph of the First Part of the “transcendental clue” (*Transzendente Leitfaden*) section leading up to the Table of Judgments, the two sentences of the Second Part preceding the Table, and the Table itself. One key

¹ Huaping Lu-Adler, *Kant and the Science of Logic: A Historical and Philosophical Reconstruction*, Oxford: Oxford University Press, 2018, p. 197.

² Michael Wolff, *Die Vollständigkeit der kantischen Urteilstafel, Mit einem Essay über Freges Begriffsschrift*, Frankfurt: Vittorio Klostermann Verlag, 1995, p. 178.

aspect of Wolff's argument is that Kant limits his notion of pure general logic to the very narrow domain of human thinking uninterpreted by any application to objects of the special sciences like mathematics. In sum, then, the issue is whether Kant feasibly argues that his notion of pure general logic represents the science of the formal rules of all possible rational thought or not.

My own view is that Kant absolutely makes a feasible argument for the completeness of the Table of Judgments and for pure general logic as a science. However, in my account of this argument I diverge strongly not only from the approach favored by Wolff and Natterer, but (it seems) from every other previous attempt to solve this problem.³ I believe that the heart of the matter lies in Kant's inheritance and critique of the Leibnizian-Wolffian philosophy.⁴ I argue that the *Critique of Pure Reason* is, as a whole, a justification of deduction – meaning that it tells us how and why we can be certain that, given premises in a deductive inference assumed to be true, the conclusion must also be true – and that Kant's justification responds to the dogmatists' failure to accomplish the very same thing. Kant's Table must be seen as a part of that justification, and his science of logic its result. To see how this is, I offer the following brief excursus.

For Christian Wolff, Kant's "dogmatic" predecessor, philosophy must be the strictest of sciences. It is the universal science that "provides the epitome of all truths (*complexus omnium veritatum*)" that occur in the special sciences⁵. Ultimately, philosophy justifies not only the most basic axiomatic truths for the special sciences, but also the very structure of scientific knowledge, which in each case is the exact deduction or demonstration of truths from evident principles. Given that science is a "skill of the mind to demonstrate everything that it claims in an irrefutable manner on the basis of irrefutable reasons"⁶, then philosophy is, ultimately, the final, self-grounding [*Letztbegründenden*] science of demonstration itself. In other words, Wolff intended his metaphysical philosophy, especially "First Philosophy or

³ See Mario Caimi, "Einige Bemerkungen über die Metaphysische Deduktion in der Kritik der reinen Vernunft", in *Kant-Studien* 91, 2000, pp. 257–282, pp. 257–259, for a comprehensive summation of the work on Kant's metaphysical deduction until that point. I would add Till Hoepfner, "Kant's Metaphysical and Transcendental Deductions of the Categories: Tasks, Steps, and Claims of Identity", in Motta, Schulting, and Thiel (eds.) *Kant's Transcendental Deduction and the Theory of Apperception*, Berlin: De Gruyter, 2022, pp. 461–492; and Till Hoepfner, *Urteil und Anschauung: Kants metaphysische Deduktion der Kategorien*, Berlin: De Gruyter, 2021.

⁴ Regarding the sense of the term 'Leibnizian-Wolffian', see Donald Rutherford, "Idealism Declined, Leibniz and Christian Wolff", in *Leibniz and his Correspondents*, Cambridge: Cambridge University Press, 2004, pp. 214–237.

⁵ Werner Schneiders, "*Deus est philosophus absolute summus*: Über Christian Wolffs Philosophie und Philosophiebegriff", in *Christian Wolff (1679-1754) Interpretationen zu seiner Philosophie und deren Wirkung, mit einer Bibliografie der Wolff-Literatur*, 2nd Edition, ed. W. Schneiders, Hamburg: Felix Meiner Verlag, 1986, pp. 9–30, p. 13.

⁶ *Ibidem*.

Ontology”⁷, to justify deduction, qua deduction, *a priori*. He intended to justify *a priori*, by metaphysical means, how it is that we can stand before each other in conversation or how we can stand before the world in, e.g., experience and natural scientific investigation and be *certain* that if our premises (whatever they may be) are true, then a definite logically consequent conclusion *must* be true as well.

But the problem is that Wolff’s deduction of the validity of deduction is viciously circular. It is circular because it presupposes what is in question; each step of his argumentation already presupposes the validity of the principles and rules of deduction that are to be validated. Moreover, it is vicious because, in this circular argumentation, Wolff attempts to demonstratively prove the existence of certain basic properties of all beings together with the ultimate beings (the soul, the world, and God) that eternally embody these principles of all demonstration. However, given this kind of circular argumentation, it would be possible to demonstrate the existence of different kinds of beings in different configurations – *to have different metaphysics* – that hold the same position as metaphysical anchors of the basic laws of deductive reason. Consequently, if we wanted to discover which metaphysics is best, or which is actually true, the only way to do this would be to reflectively identify the basic principles of deductive proof in isolation from any immediate metaphysical commitments, and *only then* to prove what metaphysical cognition is possible according to those principles.

I argue that Kant was alive to the fatal, vicious, and unscientific circularity of Wolff’s program quite early in his career, and that the problem of the justification of deduction *a priori* formed, ultimately, his deepest motivation to develop the *Critique of Pure Reason*. For in the *Critique*, Kant wanted to do this very thing. He wanted to carry out “the task of determining and judging what is lawful in reason in general in accordance with the principles of its primary institution [*Grundsätzen ihrer ersten Institution*]” (A751/B779). Otherwise, metaphysics as a discipline would remain in an uncultured and unscientific “state of nature,” (ibid) or war of all against all. No one could make a rational choice of the best metaphysics. But having discovered the principles of the “primary institution” of reason, Kant could then make “a decision about the possibility or impossibility of a metaphysics in general, and the determination of its sources, as well as its extent and boundaries, all, however, from [those] principles” (Axii). Therefore, I argue that Kant knew that he could not make this fundamental decision about metaphysics without previously or in some way simultaneously, i.e., by means of the *Critique*, both a) ascertaining and b) justifying objectively the *a priori* principles and rules of deduction as such – in a way differing radically from Wolff’s viciously circular deductive procedure.

⁷ Wolff published his *Philosophia Prima sive Ontologia* in its first edition in 1730, after his *Latin Logic*. It contains his most developed account of the principles of philosophy – of both logic and metaphysics.

What, then, is Kant's *a priori* justification of the objective validity of deduction itself in the *Critique of Pure Reason*? I do not believe this question has been directly put to Kant before.⁸ I argue that he begins the *Critique* by asking this very question in the following way. Kant finds it evident that we go about judging by way of combining concepts; for example, we can ascertain that *all bodies are divisible*, and that *all metals are also bodies*, so that we can infer *all metals are also divisible* (see A68-9/B93/4). But wherein lies the *a priori* justification of the *genuine logical consequence* or objective validity that such inferences should exemplify? Without such a justification, we could only consider our judgments, and reason itself, to be subjectively valid. I take this to be the most fundamental open question at the beginning of the text. But it is in view of ultimately answering this question, I argue, that Kant conducts a *transcendental reflection* on the totality of moments of thought that we require or presuppose for *proving* such conclusions like "all metals are bodies." His question is how we compel ourselves, from logical reasons, to decide if a given statement is true or false. Kant introduces transcendental reflection explicitly in the Amphiboly on the Concepts of Reflection, where he uses it negatively, to show the errors of the Leibnizian philosophy. However, he also indicates there is a positive use for it. And I believe Kant puts it to positive use in the Guiding Thread of the Metaphysical Deduction to derive all the moments of the Table of Judgments. The question asked in this transcendental reflection is: what are all the necessary principles and rules we require to *prove* our thoughts about sensibly given objects true or false, so that we are logically compelled to assert or negate judgments about them? The answer to this question fills out the Table and accounts for its completeness. Thus, I argue that Kant's Table of Judgments is not primarily a set of forms and functions which we can use to evaluate whether or not any given thought is formally valid. It is that, but only secondarily. It is *primarily* an outline of all the moments we require for the "logical use of the understanding" (A67/B92), i.e., for reflexively proving our thoughts to be true or false of their respective objects.

⁸ I imagine that many readers, perhaps following the lead of Alberto Coffa (*The Semantic Tradition from Kant to Carnap: To the Vienna Station*, Cambridge: Cambridge University Press, 1991), believe Kant not only did not give an answer to the question of logical necessity, but was not aware of having to answer it. For the question of the justification of deduction in general, see the investigations of Michael Dummett ("The Justification of Deduction", in *Truth and Other Enigmas*, Cambridge: Harvard University Press, 1978, pp. 290–318) and Susan Haack ("The Justification of Deduction", in *A Philosophical Companion to First-Order Logic*, edited by R.I.G. Hughes, Indianapolis: Hackett Publishing Company, 1993, pp. 76–84). I have been helped by Gordon G. Brittan Jr. (*Kant's Theory of Science*, Princeton: Princeton University Press, 2016 [1978]) and Robert Hanna (*Kant and the Foundations of Analytic Philosophy*, Oxford: Oxford University Press, 2001), although they both seem to imply that Kant's justification of deduction has to do with a tacit agreement with the Leibnizian philosophy of possible worlds. Given my thesis regarding Kant's relation to the rationalist dogmatists, I cannot accept this. I look forward to involving Nicholas F. Stang (*Kant's Modal Metaphysics*, Oxford: Oxford University Press, 2016) in my approach.

But then how does this table subserve a new and better justification of the validity of deduction? The answer to this question, I suggest, clarifies Kant's conviction that the *Critique* is a novel "*metaphysics of metaphysics*"⁹. Since he outlines the understanding as our universal method for proving our thoughts true or false, the rest of the *Critique* can *remain within this form of the understanding*. He can, as it were, use this method of proof *on itself* to prove its own capabilities and boundaries. In the rest of the Transcendental Analytic, Kant proves that if the understanding is to be able to prove its thoughts true or false, the objects it confronts should have the structure of a substantial, causal, and dynamically communal nature. This is the upshot of the Copernican turn, in which "experience itself is a kind of cognition requiring the understanding, whose rule I have to presuppose in myself before any object is given to me, hence *a priori*, which rule is expressed in concepts *a priori*, to which all objects of experience must therefore necessarily conform, and with which they must agree" (Bxvii). In the Transcendental Dialectic, he then proves that the understanding's efforts to prove extra-experiential cognitions are not valid but must nevertheless coalesce around an Ideal of Pure Reason which cannot be cognized with formal validity as an object. The end result of these two major sections of the *Critique*, which work together in this unique way, is that Kant *justifies the validity of deductive inferences in the context of bounded experience*. He also shows that it is reasonable to think (but not cognize) that the source or origin of the free rational being's logical self-determination in the world is a God that maintains a perfectly balanced relation of transcendence and immanence to the world it has created. This highest Idea is something we rationally believe. Thus, genuine logical consequence is something we can absolutely determine and bound *a priori*, so that we can self-consciously cognize it and comport ourselves according to it, but simultaneously cognize that we are not the ultimate ground of the existence of this state of affairs.

This is obviously an argument that, if plausible, should be developed in both depth and extension. But I hope to introduce it here. I will concede that Kant's argument is not in all of its details satisfactory. In particular, in his transcendental reflection he admits, with the Leibnizians, that all of our cognition must be structured in terms of the concepts of reflection. While this has a certain plausibility, it imports unjustified presuppositions about the structure of our logic into the argument. Nevertheless, Kant establishes a *form of argument* valuable for philosophy in general and for philosophy of logic: the "critical path" (A855/B883). According to this reading of Kant's critical path, one should begin philosophy by *reflection on the principles of possible cognition of an object*, that is, by asking: what are the laws cognition must obey in order to be true (or false) of its object? These principles, once obtained, serve as the origin of formal logic, so far as formal logic

⁹ Imm. Kant, *Correspondence*, translated and edited by Arnulf Zweig, Cambridge: Cambridge University Press, 1999, p. 181; Ak 10:269.

then captures how thought must relate to itself if it is to be valid. But they also serve as the origin of transcendental logic, which derives its forms (e.g., categories, schemata) from how thought should relate to objects if there is to be logically consequent cognition of those objects. This thesis regarding reflection at the heart of the *Critique* is important. It helps us discern what the *Critique of Pure Reason* says about our relation to the rational essence of our humanity.

To defend this argument, I will first briefly address some recent literature regarding Kant's science of logic and the question of the completeness of the Table of Judgments. My goal will be to show the weaknesses in the existing arguments that are both optimistic about these endeavors of Kant and those that are pessimistic about them. These weaknesses will compel me to return to the underlying question: how does Kant justify the objective validity of deduction *a priori* in the *Critique*? Then I will show how Kant recognized the failure of Wolff's justification of deduction and how this recognition, and the need to provide a revolutionary new justification, structures the argument of the *Critique*. Specifically, I want to show how Kant initially arrives at the Table of Judgments via transcendental reflection. I want to show in detail how Kant, in the Table Judgments, outlines a universal practical method of the "logical use of the understanding" for proving thoughts true or false. Finally, I will conclude by outlining how we should approach the remainder of the *Critique*, in terms of how the Transcendental Analytic and Transcendental Dialectic work together to bound pure reason – i.e., to justify deduction *a priori*.

SELECTED REMARKS ON THE LITERATURE ON KANT AND LOGIC: WOLFF, LU-ALDER, NUNEZ

There is a lot of important literature on Kant's Table of Judgments and science of pure general logic, but I will proceed chronologically through three relevant examples. My aim is to show the weaknesses in their arguments in a way that will lead me to inquire about how Kant understood Christian Wolff's metaphysical justification of deduction to be viciously circular. The first work is Michael Wolff's *Die Vollständigkeit der kantischen Urteilstafel, Mit einem Essay über Freges Begriffsschrift*, from 1995. This highly valuable book has achieved orthodox status. Paul Natterer approved of it in his scarcely imaginable effort to catalogue and evaluate all Kant commentary since 1945 in the 2003 *Systematischer Kommentar zur Kritik der reinen Vernunft*.¹⁰ And Dennis Schulting also accepted its argumentation in the 2019 update to his 2012 *Kant's Deduction from Apperception*¹¹.

¹⁰ See Paul Natterer, *Systematischer Kommentar zur Kritik der reinen Vernunft. Interdisziplinäre Bilanz der Kantforschung seit 1945*, Berlin: De Gruyter, 2003, pp. 54–61 for a helpful summary of Wolff's book.

¹¹ See Dennis Schulting, *Kant's Deduction from Apperception*. Berlin: De Gruyter, 2019, pp. xvi, 4–5.

In this book, Wolff argues that, although it is hard to see at first glance, Kant makes a deductive proof of the completeness of his Table of Judgments. This proof is situated in the text between A67/B92 to A70/B95, which consists of the single paragraph of the First Part of the “transcendental clue” (*Transzendente Leitfaden*) section prior to the Table of Judgments, the two sentences of the Second Part right before the Table, and the Table itself. This is a short but evidently not small section. In the Table of Judgments, Kant gives four titles: Quantity, Quality, Relation, and Modality. Under each of them he lists three “moments”, with which we are familiar. Quantity divides into universal, particular, and singular. Quality divides into affirmative, negative, and infinite. Relation divides into categorical, hypothetical, and disjunctive. And modality divides into problematic, assertoric, and apodictic. Before giving his sense of Kant’s proof, Wolff makes some needed distinctions. First, the table primarily outlines “functions” of the understanding. These refer to types, not tokens, of mental activity: “numerical act-unities” of thought. But it is also of “forms,” which means these functions expressed syntactically in the language of logic. Second, one might think the table suggests that all judgments must have one (and only one) of each of the four kinds of moments. Thus, there will be 3^4 possible kinds of judgment, namely 81. But Wolff argues convincingly that this is not so; Kant evidently considers, e.g., unquantified judgments, hypothetical-disjunctive dilemmas, and judgments with nested modalities to be possible. Thus, Wolff brushes aside a good deal of the criticism of Kant that is premised on this false limitation. There are indefinitely more than 81 possible kinds of complex functions or possible judgments.

Wolff then outlines his version of Kant’s proof. He first finds it necessary to ward off a looming circularity problem. In the Table of Judgments, does Kant use the *forms* of traditional ‘Aristotelian’ logic to obtain the basic functions of thought from which he then claims to derive those forms? In that case, since the functions are also the source of the categories, there would be this vicious circularity: Kant would be deriving the forms of judgment from the categories, and the categories from the forms, so that both would in fact rest on certain arbitrary decisions about the shape of experience and/or of the forms of reason, and there would be no meaningful ground of this argumentation in *a priori* functions. This would be an unforgivably contingent beginning for a critique of metaphysics. Wolff claims to solve this problem by breaking Kant’s proof into two steps. (1) Kant shows, by an analysis of the act of judgment, that there are four kinds of what he calls the “function of unity in judgments” (A69/B94) and thus indefinitely many complex kinds of such function. This is also to say there are so many possible such *forms* of judgment. For just as this analysis shows there are only four basic titles of the “function of thinking,” there are also four basic titles of the forms of judgment as well. (2) Kant separately shows that, because there are three moments under each form of unity in judgment, then, because there are four total kinds of functions and forms of unity in judgment, there are a total of twelve “functions (and forms) of the understanding.” For Wolff, dividing the proof into these two steps should ward off the threat of circularity and provide a deduction of the completeness of the Table

from the idea of the understanding as the capacity to judge in which conceptualizing, judging, and inferring are all organically unified as one *understanding* in the broad sense of the term.

I take the first step first. Wolff picks up on the example of judgment that Kant uses in the First Part of the Transcendental Clue section. If we judge "All bodies are divisible" (A68/B93), Kant argues, we relate the higher, more general concept "divisibility" to all sorts of concepts that it has "under" it. And we single out one of these here, specifically "body." The concept "body," in turn, has the higher concept of divisibility "in" it. The result is that relate the concept "body" to "certain appearances that come before us" (ibid). Wolff analyzes this act-unity of judgment into four "functions of unity." First, there is simply the entire picture of thinking as judging: the "function of thinking in judgment in general" in which we incorporate intuitions, given to us in appearances, into cognition as partial representations in concepts that relate to other concepts. This function stands for how we arrive at epistemic unities in judgment in general. Second, there is the functional use of concepts as predicates in judgments, such as the concept "divisibility" in this example. Third, there is the functional use of concepts non-predicatively, namely as subject-terms in judgments. But the non-predicative use of concepts is both immediate and mediate. In the immediate use, we relate the subject-term, e.g., "body," directly to all possible appearances of bodies. In the mediate use, we can, as in Kant's example, develop a more concrete concept of bodies such as "metal," which means that, as Kant says, "body" becomes "a concept only because other representations are contained under it by means of which it can be related to objects" (A69/B94). Therefore, "body" becomes a subject-term that is mediately related to objects since it is also a predicate-term of "metals" in the judgment "every metal is a body" (ibid). Significantly, we can conclude from the above two judgments, in an inference of mood *Barbara*, that "all metals are divisible." Wolff concludes from this analysis that there are four "functions of unity in judgment," i.e., the functions of 1) thinking in judgment in general, 2) the predicative use of concepts, 3) the immediate non-predicate use of concepts, and 4) the mediate non-predicative use of concepts. There can be indefinitely many complex ways of judging according to these functions. He infers that they correspond to Kant's four titles of modality, quantity, quality, and relation, respectively. Therefore, there are four basic kinds of functions and corresponding syntactic forms of thought.

Now the second step. Wolff attempts to show how each of the four titles necessarily has three moments under it. He begins with *quantity* and argues that we should conceive of the predicative use of concepts as quantitative because we determine via predication how many representations the predicate-term is common to. The predicate-term may be common to *all*, *some*, or *just one* of the concepts under it. Second is *quality*. Wolff reasons that the immediate non-predicative use of concepts must be deemed qualitative because we determine by means of affirmation, negation, or infinite judgment whether the appearances that directly correspond to the subject-terms really *do*, *do not*, or *do, in some way that determinately excludes*

something, have certain characteristics. Third comes the *relation* of judgments. Relation must correspond to the mediate non-predicative use of concepts. This is because this use of concepts always answers the question of ‘how, by means of the subject-term, does the predicate-term relate to objects?’ With *categorical* judgments, we treat the subject-term as a substrate for further determinations of objects. With *hypothetical* judgments, we relate two judgments, the antecedent and consequent, so that the predicate-term of the consequent relates via its subject-term to objects on condition that the antecedent is true. *Disjunctive* judgments are like hypothetical judgments, in that we take the predicate to depend on the condition of another judgment, but they are also like categorical judgments in that we assume them to hold unconditionally. Finally, *modality*. It corresponds to the use of judgments in thinking in general, since its moments, namely *problematic*, *assertoric*, and *apodictic* modalities, match up perfectly to how each relational function of judgment can lead to an inference. A categorical judgment as a major premise of a categorical inference is problematic, while the minor premise is assertoric and the conclusion apodictic. Similarly, in a *modus ponendo ponens* inference, a hypothetical judgment as a major premise is problematic, the affirmation of the antecedent in the minor premise is assertoric, and the conclusion apodictic. (As with the *modus tollendo tollens* inference.) Finally, in a disjunctive inference, the disjunctive major premise is problematic, the minor premise is assertoric, and the conclusion apodictic. Thus, modality represents how we generate “epistemic unities” of cognition in judgment. In sum, given that there are these three moments to each of the four functions of unity in judgments, there are twelve total functions, and forms, of the understanding.

I believe Wolff’s program is ingenious but unsound. First, his claim that Kant’s term “functions of unity in judgment” refers *only* to the four “titles” of what Kant calls the “function of thinking” in the “mere form of the understanding,” but not to the twelve functions or forms of the Table, is tenuous on textual grounds. It is also tenuous on argumentative grounds. This is because Wolff’s association of the “predicative use of concepts” solely with “quantity” seems artificial. Yes, predication has to do how many representations the higher predicate-concept is common to. But such quantification must equally depend on the non-predicative use of concepts. It would be impossible to judge “all metals are bodies” without the equal cooperation of the subject-term, with its immediate reference to objects, and the predicate-term, with its consequent numerical distribution. The same goes for Wolff’s association of the “immediate non-predicative use of concepts” with quality. Making an assertion or negation or infinite judgment must depend equally on the subject-term and the specific predicate-term that we apply, in each such judgment. Third, when it comes to the relation of judgments, Wolff faces a real dilemma. On the one hand, for the sake of his *a priori* completeness proof, he must reduce the three relations of judgment to the same kind of “function of unity in judgment,” so that they are all merely ways of applying a predicate-term *via* a subject-term to an object, just like the categorical judgment, which is Kant’s prime

example of this function. But this risks erasing the specific differences of the relations of judgment as “functions of the understanding,” which Kant was eager to preserve.¹² On the other hand, if Wolff admits deeper specific differences characterizing the three relations of judgment, he risks having to admit that he has no *a priori* way of accounting for their completeness but that they are, perhaps, only inherited and retained from traditional logic by *a posteriori* convenience. In the latter case, Wolff cannot save his reading of Kant from the threat of vicious circularity, which was the significant problem that motivated his plan in the first place. The same dilemma faces Wolff's treatment of modality. For Wolff considers each kind of inference (categorical, hypothetical, and disjunctive) to be an “inference of reason” which equally exhibits the three modalities. But Kant did not view things this way; for him, the modalities are distributed amongst the relations of judgments in a much more idiosyncratic way, which I will attempt to explain later. In fact, Kant does not count hypothetical inferences as inferences of reason at all.¹³ But Wolff has no way to account for this difference without admitting contingency in the choice of the three relations. Finally, the biggest objection I level against Wolff is that he assumes that, after Kant presents the Table of Judgments, Kant intended to make a deductive proof of the completeness of the Table *extrinsic to the Table itself*. However, if the Table truly represents the moments of all possible rational thought, how could any deductive proof extrinsic to the table not be superfluous? Such a proof would repetitiously employ the very same moments of the Table. Thus, the very idea of such an extrinsic and deductive proof seems wrong.¹⁴ Moreover, Kant had seen Christian Wolff's attempt to *deduce* the

¹² “Categorical judgments constitute the matter of the remaining judgments, to be sure, but one must not on this account believe, as several logicians do, that both hypothetical and disjunctive judgments are nothing more than various clothings of categoricals and hence may be wholly traced back to these latter. All three kinds of judgments rest on essentially different logical functions of the understanding and must therefore be considered according to their specific difference.” (Imm. Kant, *Lectures on Logic*, translated and edited by J. M. Young, Cambridge: Cambridge University Press, 1992a, p. 601; Ak 9: 105).

¹³ “From the fact that the hypothetical inference consists only of two propositions, without having a middle concept, it may be seen that it is really not an inference of reason, but rather only an immediate inference, to be proved from an antecedent proposition and a consequent proposition, as to matter or form (*consequentia immediata demonstrabilis [ex antecedente et consequente] vel quoad materiam vel quoad formam*).

Every inference of reason is supposed to be a proof. But the hypothetical carries with it only the ground of proof. It is clear from this, consequently, that it cannot be an inference of reason.” (Imm. Kant, *Lectures on Logic*, p. 623; Ak 9: 129).

¹⁴ In fact, Wolff tries to cement Kant's notion that there can only be three elements under each title in the Table with a meta-argument to the effect the very idea of an *a priori* conceptual division must be three-fold for Kant (I will not rehearse this here). The problem with this argument must be that it would seem able to prove the completeness of any set of formal logical judgment-relations that satisfy this certain very basic schema. So, the proof is superfluous if the trichotomies of the table are already deemed complete in some other way. But if they are not already deemed complete, then such a proof would seem to do nothing concrete for *this* table of judgments.

completeness of the laws and rules of deductive reason. Might Kant not have tried to chart another, critical path to the proof of the validity of deductive reason?

Huaping Lu-Adler, in her *Kant and the Science of Logic: a Historical and Philosophical Reconstruction* from 2018, does not evaluate Michael Wolff's commentary on Kant's Table of Judgments. Instead, she argues that successful attempts to prove the completeness of the Table, and even show that it is the *a priori* source of the Table of Categories, "are not forthcoming."¹⁵ Here is a brief account of how she comes to this conclusion. Again, we begin with Kant's science of formal logic. How can he justify the claim that it is "the science that exhaustively presents and strictly proves nothing but the formal rules of all thinking?" (Bix) How, according to his sense of a strict science, does it rest on a set of *a priori* principles which, together with its theorems, are apodictically certain? Moreover, how does Kant prove the special property of formal logic, namely that it is a *canon* for the evaluation of the formal validity of thought, and not an *organon* for arriving at any substantial cognition of objects of any kind?¹⁶ These are Lu-Adler's questions. And she begins her investigation like this: "While Kant never explicitly offered the requisite justification, it behooves his interpreters to figure out whether a worthwhile version thereof may at least be constructed on his behalf."¹⁷

To zero in on the nature of such a justification, Lu-Adler refers to Kant's Introduction to Transcendental Logic, where he distinguishes pure general and transcendental logic. According to her sense of the Fourth Part of this passage, Kant's formal logic and transcendental logic must have two different origins. For in order to arrive at transcendental logic, Kant would have us take two steps. First, we "isolate the understanding . . . and elevate from our cognition merely the part of our thought that has its origin solely in the understanding," although under the condition that "objects are given to us in intuition, to which it can be applied" (A62/B87). Second, we exclude everything that arises empirically from what we think by concepts, so that "merely the part of our thought that has its origin solely in the understanding" remains (ibid). Lu-Adler detects no sign in this passage that Kant thinks to "presuppose [for the establishment of transcendental logic] the concept of pure general logic"¹⁸ which he had just explicated in the Third Part of the Introduction to Transcendental Logic. Moreover, while transcendental logic depends on the condition of objects being given in intuition, formal logic does not seem to need this condition. For it is abstracted entirely from any relation of thought to objects. As Kant says, it "deals only with the form of the understanding, which can be given to the representations wherever they may have originated"

¹⁵ Lu-Adler, *op. cit.*, p. 197.

¹⁶ "A **general** but **pure** logic therefore has to do with strictly *a priori* principles and is a **canon of the understanding** and reason, but only in regard to what is formal in their use, be the content what it may (empirical or transcendental)" (A53/B77).

¹⁷ Lu-Adler, *op. cit.*, p. 142.

¹⁸ *Ibidem*, p. 158.

(A56/B80). Therefore, Lu-Adler suggests that, because formal logic seems to have a completely separate origin, it needs its own justification, namely as “a transcendental derivation”¹⁹ of a) its status as the science of the form of all rational thought, and of b) its restriction to being the canon of the form of thought alone and not an organon of any kind of substantial cognition. “For only then can Kant restrict the use of logic to that of a mere canon without begging questions against the alternative views.”²⁰ Or, in other words, since Kant says that the categories arise from “as it were, a system of the **epigenesis** of pure reason” (B167) from the Table of Judgments, he must require a deeper epigenesis of the functions of judgment from the primitive, absolutely original laws of the human understanding. However, and here is the conclusion, this epigenesis is impossible for us. Such primitive laws would have to be “self-thought” in a “radical” epigenesis or emergence that would be inscrutable for any finite thinker.²¹ Lu-Adler argues that this very inscrutability of the origin of our logical laws must serve as Kant’s sole, *negative* proof of logic’s limitation that it “should not be used an organon in the material-productive sense.”²² But he cannot have any *positive* justification of the completeness of the Table or of formal logic, with respect to any fundamental principles of logic.

I would cast doubt on Lu-Adler’s argument in the following way. Her view depends on Kant having proposed and developed transcendental logic in isolation from any contribution of, or shared origin with, formal logic. But this certainly begs the question in favor of her argument for a separate origin of formal logic, especially in light of the evidently much different order of argument in the *Critique*, in which Kant first arrives at the Table of Judgments *a priori* – the origin of his formal logic – and then, from that Table, obtains the Table of Categories. However, while Lu-Adler relies on the Fourth Part of the Introduction to Transcendental Logic to make her argument, that section cannot say what she thinks it says. For there, Kant speaks about obtaining transcendental logic by isolating the understanding while admitting that the “use of this pure cognition . . . depends on this as its condition: that objects are given to us in intuition, to which it can be applied” (A62/B87). But despite Lu-Adler’s conviction that this statement has no bearing on formal logic, it seems to directly refer us back to the First Part of the Transcendental Clue chapter that builds up to the Table of Judgments. For in that part of the Metaphysical Deduction, we observe Kant doing just that: isolating the pure understanding to analyze the moments of “the logical use of the understanding in general” (A67/B92) while, of course, admitting the necessary condition that objects be given in intuition for its application to them. In this section, Kant then obtains both the Table of Judgments and, by means of it, his formal logic, while subsequently obtaining the transcendental categories from the

¹⁹ *Ibidem*, p. 175.

²⁰ *Ibidem*, p. 169.

²¹ *Ibidem*, p. 193.

²² *Ibidem*.

Table of Judgments. Therefore, he very much seems to have an argument that serves as the dual origin of both formal and transcendental logic.

Moreover, Lu-Adler, in her conviction that Kant cannot have obtained the fundamental laws or principles of formal logic because they would have to arise in an absolutely inscrutable origin, should contend with the fact that, as Reinhard Brandt²³ has seen, Kant nevertheless did advance in the *Jäsche Logic* “three principles . . . as universal, merely formal or logical criteria of truth,” namely:

1. *the principle of contradiction and of identity (principium contradictionis and identitatis)*, through which the internal possibility of a cognition is determined for *problematic* judgments;
2. *the principle of sufficient reason (principium rationis sufficientis)*, on which rests the (logical) *actuality* of a cognition, the fact that it is grounded, as material for *assertoric* judgments;
3. *the principle of the excluded middle (principium exclusi medii inter duo contradictoria)*, on which the (logical) *necessity* of a cognition is grounded - that we must necessarily judge thus and not otherwise, i.e., that the opposite is false - for *apodeictic* judgments.²⁴

Furthermore, in his polemic against Eberhard in the same year of 1790, Kant confirmed his allegiance to these principles of formal logic. He stated that, for him, the principle of sufficient reason, namely, “That every proposition must have a reason, is the logical (formal) principle of cognition which is subordinated to, and not set besides, the principle of contradiction.”²⁵ How, then, might we understand Kant’s establishment and use of these three principles, which seem to correspond to his three relations of judgment (categorical, hypothetical, and disjunctive) and his three modalities (problematic, assertoric, and apodictic)? I will attempt to explain this.

Finally, Tyke Nunez published an appreciate review of Lu-Adler’s book in 2020. I will briefly evaluate it, and this will lead me finally to investigate how Kant responded to Christian Wolff’s metaphysical philosophy of logic in the *Critique*. Nunez argues that, while Lu-Adler emphasizes a tension between a) the need to independently justify Kant’s science of formal logic as a science, based on his completeness claim for the Table of Judgments, and b) her argument that such justification is impossible, no such tension should even arise in the first place. This

²³ Reinhard Brandt, *The Table of Judgments: Critique of Pure Reason A67-76/B92-101*, translated and edited by Eric Watkins, Atascadero, CA: Ridgeview Publishing Co., 1995 [1991], p. 96.

²⁴ Imm. Kant, *Lectures on Logic*, p. 560; Ak 9: 53.

²⁵ Imm. Kant, *Theoretical Philosophy after 1781*, edited by Henry Allison and Peter Heath, translated by Gary Hatfield, Michael Friedman, Henry Allison, and Peter Heath, Cambridge: Cambridge University Press, 2004b, p. 289; Ak 8: 193.

is because such a justification of Kant's logic as a science is even more evidently impossible than Lu-Adler realizes. First, there can be no transcendental derivation or deduction of the laws of formal logic, since a transcendental deduction depends on there being an *a priori* relation between pure thought and objects, while formal logic deals only with thought. Second, there can be no epigenesis of the laws of formal logic either, since epigenesis requires two basic elements (in biology, sperm and ovum; in transcendental logic, forms of judgment and forms of space and time). But formal logic recognizes no element beside the forms of thought. Nor can Kant prove the completeness of the Table of Judgments, since any such proof would be *circular*. For Nunez, this last realization epitomizes the sense of what Harry Sheffer, in his 1926 review of Russell's and Whitehead's *Principia Mathematica*, identified as the "logocentric predicament": "*In order to give an account of logic, we must presuppose and employ logic.*"²⁶

Nunez makes the following conclusion about Kant's principles of logic as a science: "We can only investigate the laws of reason with reason, and while as laws these will be necessary, this necessity is a fact that cannot be proved."²⁷ But I would respond that, if Kant had found no way to justify the laws of logic, then he never would have counted them as necessary. Moreover, Sheffer did not imply by the "logocentric predicament" that we cannot justify the validity of any account of logical laws, as Nunez seems to assume. Rather, Sheffer wanted to make a certain distinction. He argued that we have to keep strictly separate a) the means we use to establish our syntactically or symbolically annotated functions of logic and b) our semantic or metaphysical study of what makes these functions "*significant and valid.*"²⁸ If we do keep these separate, then there should be ways of justifying the validity of our logic. If we do not keep these separate, then we cannot have a legitimate justification. Thus, Sheffer's logocentric predicament rules out as illegitimate, e.g., any viciously circular attempt to *demonstrate* that the very same principles and rules of *demonstration as such* follow from some extrinsically fixed properties of reason or of beings; such attempts illegitimately intertwine problems of syntactic or symbolic form of logic with problems of the meaning or validity of logic. This problem obviously afflicted Christian Wolff's metaphysical philosophy of logic. I argue Kant knew this and pursued a solution that did not involve deducing the rules of deduction from fixed principles or beings.

²⁶ Tyke Nunez, "Review of Huaping Lu-Adler. *Kant and the Science of Logic: a Historical and Philosophical Reconstruction*", in *Journal for the History of Analytical Philosophy* 8:7, 2020, pp. 17–31, p. 27; Harry Sheffer, "Review of *Principia Mathematica* by Whitehead, Alfred North and Russell", in *Isis* 8:1, 1926, pp. 226–231, p. 228.

²⁷ Tyke Nunez, "Review of Huaping Lu-Adler. *Kant and the Science of Logic: a Historical and Philosophical Reconstruction*", p. 27.

²⁸ Harry Sheffer, "Review of *Principia Mathematica* by Whitehead, Alfred North and Russell", p. 228.

KANT'S UNDERSTANDING OF CHRISTIAN WOLFF'S METAPHYSICAL JUSTIFICATION OF DEDUCTION

Let us review Christian Wolff's doctrine of principles in *First Philosophy or Ontology*. These are the principles or laws of non-contradiction, excluded middle, identity, and sufficient reason. He considers them to be immediately both logical and ontological (and psychological), and so he conceives of them in the precise way Sheffer considers illegitimate: he immediately intertwines questions of form and questions of meaning. I hope to make explicit how Wolff commits this error, and then show how Kant realized this as well and made moves to come to a better justification of the necessity of the logical laws in question. Wolff intended the following. He wanted to establishing the absolute certainty of the principle of non-contradiction and then deduce the subsequent principles from its definition, i.e., to analytically trace them back to that principle. This would legitimate deduction as the formal method of all possible special sciences, in terms of the deductive relation between their axioms, postulates, and theorems. It would also establish these four highest principles as material or ontological principles of the basic objects of the sciences of psychology, natural science, and natural theology. Ultimately, the totality of these principles, in their combined logical-ontological sense, would provide, for the nexus of cognition of the world, what Kant would later deride as a "general and certain criterion of the truth of any cognition" (A59/B83).

Consider Wolff's deductive justification of his principles. The first is the principle of non-contradiction, to which he gives a psychological origin. "*We experience this as the nature of our mind, that it, when it judges that something is, cannot at the same time judge that the same thing is not.*"²⁹ At first glance, it seems that Wolff grounds this principle in an immediate intuition, or the undeniable psychological experience involved in judging. Therefore, it must be an absolutely certain principle. However, the situation is more complex. This principle is requisite for formal logic. Formal logic is in turn requisite for the science of psychology. Yet Wolff attempts to derive this principle from a psychological statement about the nature of the mind and its experience of beings even though this statement, in turn, depends on that same fundamental logical principle. Thus, Wolff's opening move, which is to ground the principle on the nature of the mind and its relation to beings, is viciously circular. The two elements involved, namely the badly conceived law and the badly conceived psychological or ontological property of the mind or soul, viciously reinforce each other. Wolff's second

²⁹ Christian Wolff, *Philosophia prima sive ontologia/Erste Philosophie oder Ontologie* §§1–78, translated and edited by Dirk Effertz, Hamburg: Felix Meiner Verlag, 2005 [1730], p. 61.

principle is that of the excluded middle. It is the demand that in every set of contradictory statements, one is true and the other false. Wolff, in §532 of the *Latin Logic*, wanted to prove the principle of excluded middle from the principle of contradiction in the following way. If we consider two contradictory statements, namely *All A is B* and *Some A is not B*, but remove the principle of excluded middle from effect, the two statements in question are either both true or both false. Thus, we assume that *All A is B* is false. But we can infer from this that *Some A is not B* is true, which contradicts the assumption that both statements are false. Thus, the principle of excluded middle must be valid. However, as Dirk Effertz, editor of the Felix Meiner edition, remarks, this argument is circular; the inference from the falsity of *All A is B* to the truth of *Some A is not B* is “equivalent to the principle of excluded middle.”³⁰ Wolff realized this and, in §32 of *First Philosophy or Ontology* inferred the universal principle of excluded middle by induction from individual cases like “either it is day, or it is night.” But this cannot work so well either, since induction is simply too weak a procedure to justify a universal principle of deduction. Next, there is the principle of identity: “if *A* is, then it is in every case true that *A* is.” Wolff sets out to prove it indirectly. He negates the assumption of the principle and finds that this violates the principle of non-contradiction, as it results in the statement *A is and A is not*. Effertz notes that this proof holds, but we must keep in mind that we presuppose the principles of contradiction, excluded middle, and identity for every such deductive argument in the first place, and we could not make any step forward without them.³¹

What was Kant's response to Wolff's viciously circular attempt to justify deduction? I believe he identified this problem very early in his publishing career. For example, in the *False Subtlety of the Four Syllogistic Figures* of 1762, Kant distanced himself from Wolff's account of the mind as a living power of representations and instead focused on the more rarified capacity of the human understanding to make judgments about objects with propositional content, i.e., to say things that are true and false about them.³² He began to assimilate concepts, judgments, and inferences to the capacity of judgment, and anticipated his later notions of “functions of unity in judgments” and “functions of the understanding.” Notably, he based the traditional definition of true and false universal judgments,

³⁰ *Ibidem*, p. xxii.

³¹ I leave out Wolff's attempt to derive the principle of sufficient reason from the principle of contradiction. This proof was widely recognized, including by Wolff himself, not to hold. For this reason, Wolff appealed to another “transcendental argument” to the effect that, if the world were not arranged according to the principle of sufficient reason, we would live in a dream-world or *Schlaraffenland*.

³² See Mihaela Vatavu, “Kant's innovative theory of judgment and cognition in the *False Subtlety of Syllogistic Figures*”, in *Kant-Studien* 110:4, 2019, pp. 527–553.

the *dictum de omni et de nullo*³³, not on Wolffian ontological principles, but solely on the capacity to judge. Thus, he anticipated his later observation in the Transcendental Clue chapter of the Metaphysical Deduction that, with categorical judgments like “all bodies are divisible,” we can relate to objects in appearances more concretely by e.g., stating that “all metals are bodies,” and then, thanks to the structure of concepts in judgments, inferring that “all metals are divisible.” Here is a statement to this effect:

The considerations which have been adduced show that the first general rule of all affirmative syllogisms is this: A characteristic mark of a characteristic mark is a characteristic mark of the thing itself (*nota notae est etiam nota rei ipsius*). And the first general rule of all negative syllogisms is this: that which contradicts the characteristic mark of a thing, contradicts the thing itself (*repugnans notae repugnat rei ipsi*). Neither of these rules is capable of further proof. For a proof is only possible by means of one or more syllogisms, so that attempting to prove the supreme formula of all syllogisms would involve arguing in a circle.³⁴

Importantly, Kant points out that such rules or functions of unity in judgment are not susceptible to further proof of the kind that Wolff attempted to give. They are not “capable of further proof. For a proof is only possible by means of one or more syllogisms, so that attempting to prove the supreme formula of all syllogisms would involve arguing in a circle.” In other words, we cannot meaningfully deduce that these rules, e.g., *follow from* ontologically interpreted principles of identity and contradiction, since such deduction would presuppose and operate by the same rules. Thus, Kant separates the treatment of the rules and language of logic (its functions and forms) from the treatment of its meaning, and thus from the effort to justify its validity, as he should. The question then becomes: how does Kant reconnect in the *Critique* what he separated in the *False Subtlety*, in order to justify deduction in a novel way?

³³ See Aristotle, *Categories. On Interpretation. Prior Analytics*, translated by H. P. Cooke, Hugh Tredennick, Cambridge, MA: Harvard University Press, 1938, p. 202; An. Pr. 24b29. The *dictum* is Aristotle’s definition of the meaning of universal affirmation and universal negation in the *Prior Analytics*. It states that the universal affirmation of a predicate-term of a subject-term (“All A is B”) is true if and only if “no examples of the subject can be found of which the other term [the predicate-term] cannot be asserted.” Similarly, the universal denial of a predicate-term of a subject-term is true if and only if no examples of the subject can be found of which the predicate can be asserted. Logicians have taken the *dictum* to state the criterion of the truth of universal affirmative and negative statements from which the validity of the whole syllogistic (of all its immediate inferences and syllogistic moods) should follow.

³⁴ Imm. Kant, *Theoretical Philosophy, 1755–1770*, translated and edited by David Walford in collaboration with Ralf Meerbote, Cambridge: Cambridge University Press, 1992b, p. 91; Ak 2: 49.

Kant raises this problem of a new justification of deduction in the *Critique*. In the first sentence of Part III of the Introduction to Transcendental Logic, "On the division of general logic into analytic and dialectic," he states (A57-58/B82):

The old and famous question with which the logicians were to be driven into a corner and brought to such a pass that they must either fall into a miserable circle or else confess their ignorance, hence the vanity of their entire art, is this: **What is truth?** The nominal definition of truth, namely that it is the agreement of cognition with its object, is here granted and presupposed; but one demands to know what is the general and certain criterion of the truth of any cognition.³⁵

I believe that the sense of Kant's question "What is truth?" remains obscure unless we realize that he means by "truth" "logically consequent cognition." Here, Kant accuses Leibnizian dogmatists, especially Wolff, of running together questions of the *form* of logical consequence in cognition with the philosophical proof of the *validity* of that form. Wolff in particular succumbed to this confusion hoping to obtain a "general and certain criterion of the truth of any cognition." But this effort was a "miserable circle" that presents "the ridiculous sight (as the ancients said) of one person milking a billy-goat while the other holds a sieve underneath" (A58/B82-83), as we have seen. Instead, Kant will grant the "nominal definition of truth," "agreement of cognition with its object," and explicate its form in the Table of Judgments. But he will not conferring any immediate metaphysical meaning on it or on its principles. Then he will go about justifying it in a new way.

Kant proposes a new "logic of truth" (A62/B88) in the *Critique*. Given that he needs an alternative method of justifying deductive reason *a priori* in order to make a critical "decision" regarding metaphysics as a science, it must include a new way to the principles of logic truth and to the justification of deduction. I suggest that we can best discover this alternative method in the remarks Kant makes in the Appendix: On the amphiboly of the concepts of Reflection through the confusion of the empirical use of the understanding with the transcendental" (A260/B316). In this section, which is difficult, Kant suggests the following ideas. First, he admits that he shares common ground with the Leibnizians. He agrees with them that all of our cognition is, at bottom, structured according to basic "concepts of reflection." These concepts outline the relations "in which the concepts in a state of mind can belong to each other" (A261/B317). These concepts are identity/difference, agreement/opposition, inner/outer, and matter/form. They seem appreciably basic, since if we do admit we have cognition of objects, it would be hard to deny that we do not conceive of, and think according to, these

³⁵ Imm. Kant, *Critique of Pure Reason*, translated and edited by Paul Guyer and Allen W. Wood, Cambridge: Cambridge University Press, 1998.

distinctions. Kant accuses Wolff and Leibniz of having tried to obtain their fundamental logical-ontological principles from how we compare concepts in general according to the concepts of reflection. However, this procedure is the same “miserable circle” we found in Wolff’s attempt to deduce the principles of deduction and characterize things in themselves according to those same principles. In this passage, Kant singles out Leibniz’s principles (e.g., the principle of identity of indiscernibles, the principle of no logical opposition between monads, the principle of pre-established harmony), not Wolff’s, but the implication is the same. Leibniz ultimately proposed that the object of cognition is intellectually, but not sensibly, intuited. This is true also for Wolff, who tried to base the principle of contradiction in an immediate intuition. But Kant, by reflecting on the “miserable circularity” of the dogmatists’ foundational arguments, refutes this notion and postulates instead that we face only a sensibly intuited object of cognition. Kant then calls his method of reflecting on dogmatics’ circular argumentation, and distinguishing the comparison of concepts of intellectual origin from that of concepts of sensible origin, *transcendental reflection*:

The action through which I make the comparison of representations in general with the cognitive power in which they are situated, and through which I distinguish whether they are to be compared to one another as belonging to the pure understanding or to pure intuition, I call **transcendental reflection**.

Kant suggests that he can use transcendental reflection not only to demonstrate the erroneous production of Leibnizian/Wolffian principles, as he does in the Amphiboly, but that he can also use it positively to obtain a critical account of the principles and rules of our logically consequent cognition of objects. For Kant also describes his fundamental method in this way:

...**transcendental reflection**, however, (which goes to the objects themselves) contains the ground of the possibility of the objective comparison of the representations to each other, and it is therefore very different from [mere logical reflection], since the cognitive power to which the representations belong is not precisely the same. This transcendental reflection is a duty from which no one can escape if he would judge anything about things *a priori*.

This quote indicates the following basic stance for Kant’s *Critique*. In any cognition, there is a subject of cognition, who faces a sensibly given object. Any cognition the subject has of the object is structured according to concepts of reflection. This subject has the duty of reflecting in such a manner as to discover the “ground of the possibility of the objective comparison of the representations to each other,” i.e., the principles and rules of logically consequent cognition of sensibly given objects. I will now argue that we can read the Transcendental Clue section of the *Critique*,

specifically the section that leads up to and includes the Table of Judgments, as a prime example of this positive use of transcendental reflection.³⁶

TRANSCENDENTAL REFLECTION AND THE COMPLETENESS OF THE TABLE OF JUDGMENTS

I do not agree with Michael Wolff that, in the section right before the Table of Judgments, Kant makes a division of four “functions of unity in judgment,” which each have under them three “forms” and “functions of the understanding.” Instead, I think Kant takes both these terms, “functions of unity in judgment” and “functions of the understanding,” to mean the twelve moments of the Table. Moreover, in contradistinction from Wolff, I think this section contains a transcendental reflection on cognition of a sensibly given object. Now, I intend to show that, when Kant argues according to this method, he develops *three distinct senses* of what he calls the “Transcendental Clue” for the discovery of the Table of Judgments and the categories.

First, Kant's Clue is very general. It stands for the overarching “idea” or “principle” of the “understanding, as absolute unity” (A67/B92). According to Michael Wolff, this idea is merely the idea we form of our “understanding in general” as being equivalent to “the capacity to judge.” I argue that he must be right but not right enough; rather, Kant must mean that it is idea we form of our own understanding so far as we are seeking to *justify* our cognition and all the functions by which we cognize, including, most profoundly, the validity of deduction itself. Our understanding is organized inwardly like an organism and grows outwardly in its critical self-understanding because it is *self-justifying*. It even reaches beyond the sensible world to attempt to justify itself as a part of the Transcendental Ideal. However, as Kant makes explicit in the Amphiboly, he must begin in the *Critique* by asking how we justify our logically consequent cognition of *sensibly given objects*. Thus, he argues that, as our cognition of sensibly given objects is spontaneous and self-justifying, it is discursive, i.e., our concepts rest on judgments that are in principle forever revisable. We can always revise or refine what we think. Kant gives as his example the judgment “**all bodies are divisible**” (A68/B93). Having made this judgment, we can refine our concept of bodies. We can identify substances we deem “metals” and then state, “every metal is a body” (A69/B94). These two statements together subordinate the concept of “metals” to

³⁶ Here, I am following up a suggestion of Karin De Boer (*Kant's Reform of Metaphysics*, Cambridge: Cambridge University Press, 2020, p. 199): “Clearly, this table [of the concepts of reflection] is analogous to the table of the forms of judgments and, hence, to the table of the categories... These analogies – not explicitly mentioned in the text – suggest that Kant considered the concepts of reflection to instantiate the very functions of the pure understanding that the Metaphysical Deduction treats from a different point of view.”

the concept of “divisibility,” so that we conclude that “all metals are divisible.” Kant’s point is that judgments ground both concepts and syllogistic inferences, in which we unify representations under higher representations. This gives Kant the second sense of the Transcendental Clue, namely that judgments are structured by “functions of unity in judgments” (*ibid.*). Functions of unity in judgments are the basic ways the self-justifying understanding unifies representations. Kant then concludes, before giving the Table, by saying two things. 1) If we *exhaustively exhibit* the “functions of unity in thinking,” we obtain the “functions of understanding,” which are the twelve moments of the table. 2) If we abstract from the content of our actual judgments to get their form, we also get the twelve “functions of understanding” in the table. “Functions of the understanding” must then be Kant’s third sense of the Clue. My reading of these two remarks is that, taken together as they must be, they *jointly describe transcendental reflection*. In such a reflection, we must 1) abstract from any of our actual empirical judgments to get their form, but as we are asking ourselves about the functions that are *universally required* to prove our thoughts to be true or false of sensibly given objects, this means that 2) we also obtain the “functions of unity in judgment” that are the “twelve basic functions of the understanding”.

Let us consider this moment in the *Critique*, just prior to the Table. We see the inference from “all bodies are divisible” and “all metals are bodies” to “all metals are divisible.” But what justifies this deductive inference as valid? Kant does not have Wolff’s ontological justification of deduction, which is fallacious. He does not possess any justification of it at all. Of course, if the example were based on a mere induction, i.e., an empirical gathering of information about bodies and metals, it would not be valid. Therefore, *Kant needs to outline all the rules involved in the kind of cognition in which we would take ourselves to hold such a judgment, one that we make about inductively gathered content, to be logically consequent*. This cognition extends beyond mere categorical judgments and inferences. I believe Kant obtains his outline of these functions or rules by a transcendental reflection on an example of such cognition. Now, Kant does not offer any example of this procedure of transcendental reflection in the *Critique*. He does not offer an example of an actual logical use of the understanding such that we can abstract from its content, get its form, and grasp the twelve functions of the understanding. But there is a passage in the *Jäsche Logic*, namely Section VII of the Introduction, where he does. The passage is important, and, in fact, it begins with Kant’s question from the Introduction to Transcendental Logic: “**what is truth?**” And it proceeds from that question to the question of the logically necessary criteria for objective cognition. Its example is a proof that “that the earth is not flat.”³⁷ Kant says:

³⁷ Imm. Kant, *Lectures on Logic*, p. 560; Ak 9: 52.

To show, e.g., that the earth is not flat, I may just infer apagogically and indirectly, without bringing forth positive and direct grounds: If the earth were flat, then the pole star would always have to be at the same height; but this is not the case, consequently it is not flat.

We can imagine ourselves conducting this investigation to see all its parts. By abstracting from the content of the judgments involved to get their form, we can then observe how this kind of investigation necessarily presupposes all of the twelve functions of the understanding in the table. First, we state “the Earth is flat.” This is a *singular, affirmative, problematic categorical* judgment. Let us assume we do not know if the statement is true or false. What procedure must we follow according to rules or functions that would compel us to decide? First, we connect the judgment to an outer condition. In this case, we rather ingeniously say, “if the Earth is flat, then the pole star is always at the same height above the horizon.” This is a *hypothetical* judgment in which both component judgments are *problematic*. We then make an *assertoric* judgment that the Earth is flat, and take it as a *problematically necessary consequence* that, no matter where we go, the pole star will always be at the same elevation in the sky. This is an inference of the form *modus ponendo ponens*. But we have to test whether this consequence holds. We could do this by simply traveling around and observing. If this means we make a *particular* judgment and say that the pole star remains at the same height in some observations, we uphold the consequence as probably true. If we make a *universal* judgment and say that the pole star is the same height from every vantage point, then we uphold the consequence as *necessarily* true. And, finally, if we observe a significant difference in height, then we make a *modus tollendo tollens* judgment; we are logically necessitated to conclude with the *negative* judgment that the earth is not flat. Finally, in each case we conclude with a *disjunctive* judgment. For example, in the negative case we say that ‘the Earth is not flat, but not-flat, namely some shape other than flat (circular, ovoid, etc.). This also involves an *infinite* judgment. In the last case especially, our concluding disjunctive judgment is *logically necessary* or *apodictic*. We can be absolutely certain the Earth is not flat. To sum up, reflection on this example shows the twelve essential moments of the logical use of the understanding. The procedure absolutely requires the twelve moments Kant gives in the Table. Therefore, I believe that transcendental reflection on how we must prove our thoughts to be true or false, at the most basic level of experience and cognition, accounts for the completeness of the Table of Judgments.

In the *Jäsche Logic*, Kant gives this example and then, after a brief analysis, concludes from it that only now is he “able to advance three principles here as universal, merely formal or logical criteria of truth.” To repeat, these fundamental principles of logic are:

1. *the principle of contradiction and of identity (principium contradictionis and identitatis)*, through which the internal possibility of a cognition is determined for *problematic* judgments;
2. *the principle of sufficient reason (principium rationis sufficientis)*, on which rests the (logical) *actuality* of a cognition, the fact that it is grounded, as material for *assertoric* judgments;
3. *the principle of the excluded middle (principium exclusi medii inter duo contradictoriam)*, on which the (logical) *necessity* of a cognition is grounded – that we must necessarily judge thus and not otherwise, i.e., that the opposite is false – for *apodeictic* judgments.³⁸

I argue that these fundamental principles of logic are equally formal-logical and transcendental-logical. They obviously correspond to the three relational functions of the understanding, namely categorical, hypothetical, and disjunctive judgments, and to the modalities related to them of the problematic, assertoric, and apodeictic. This makes sense given the organic procedure of proof that Kant outlines. Since Kant arrives at these principles by transcendental reflection, they are a prime instance of transcendental cognition, according to Kant's distinction: "not every *a priori* cognition must be called transcendental, but only that by means of which we cognize that and how certain representations (intuitions or concepts) are applied entirely *a priori*, or are possible (i.e., the possibility of cognition or its use *a priori*)" (A56/B80-1). Transcendental cognition is cognition of how cognition arrived at by deductive means, i.e., *a priori* cognition, is justified as being *a priori*. The unique property of this transcendental reflection for the laws of logically consequent cognition is that it serves as the dual origin of 1) formal logic, which is the "analysis of the actions of reason into their moments, without taking into consideration the particular nature of the cognition about which it is employed" (A131/B170), and 2) transcendental logic, which is the exposition of "the elements of the pure cognition of the understanding and the principles without which no object can be thought at all" (A62/B87). But importantly, this is a common origin that preserves the difference between formal and transcendental logic.

At this point, one could object to Kant that his example presupposes experience. But this objection cannot carry any weight. Since Kant, in the rest of the *Critique*, will bound all possible cognition to experience, it is inconceivable that an example could come from anywhere else. Moreover, Kant has yet to derive

³⁸ Importantly, Kant reverses Wolff's procedure. Wolff's *Latin Logic* is divided into two big parts: a theoretical one on the principles of logic and a practical one on the use of logic, which primarily includes its use in proofs and demonstrations. Kant instead begins with the use of logic, since he knows that the attempt to deduce logic from its principles is circular, and one should instead reflect on the use of it to prove anything whatever. Then he reasons backwards, as it were, from this use to the principles of logic. Kant also speaks of a transcendental "practical logic" in this way (not for morality but as a general method of demonstration) at A708/B736.

the categories from the functions of the understanding. Nor has he argued that the categories are the only possible necessary conditions of the objective validity of the functions of the understanding, so far as they make experience possible. In other words, Kant has not yet justified deduction as such, which is his underlying aim. These rules of thinking in judgment in the Table are, at this point of the argument, simply the subjective way in which we have to think if we are going to say anything we can take to be logically compelling. But as to what kind of objects must exist if we are such creatures that can exercise proof, and whether we can exercise proof beyond those objects – Kant has yet to make these arguments. A related objection would be that relying on such an example seems too contingent. Precisely what kind of argument is this? I would say in response that the argument is guided by *a priori* conditions Kant feasibly believes to be sufficient. To repeat, Kant agrees with the Leibnizians that all cognition is built from “concepts of reflection,” namely the basic conceptual relations of identity/difference, agreement, inner/outer, form/matter. We use these concepts in logical reflection for comparing concepts with each other. But we also use them in transcendental reflection, to compare concepts with each other with respect to sensibly given objects, for the sake of objective cognition of those objects. Thus, these concepts underlie and guide the transcendental reflection which results in the Table of Judgments. To put it briefly, in terms of Kant's example, if we feel we perceive some *identity*, rather than *difference* between the Earth and other flat things, then we entertain the problematic judgment that these concepts *agree* rather than *oppose* each other. We then investigate whether the *outer* relations we perceive really do reflect comparatively *inner* relations between the Earth and the property of flatness by the use of hypothetical inferences. Finally, we conclude by expressing the specific relation between the *form and matter* of cognition we arrive at in the form of disjunctive judgments. Thus, we respond to the *a priori* demands of these concepts of reflections when we seek logically necessary cognition.

CONCLUSION: HOW IS THE REST OF THE *CRITIQUE OF PURE REASON* A JUSTIFICATION OF DEDUCTION?

After setting up the Table of Judgments, which outlines the moments we presuppose in proving our thoughts about objects true or false, Kant still has to bring off the profound goal of the *Critique*, which is to justify deduction *a priori* in relation to his critique of metaphysics. How does he do this? I argue that this is where he puts his conception of proof to its intended critical use by proving the domains in which we can, and in which we cannot, use our understanding. But this takes the rest of the entire *Critique*. This involves the Transcendental Analytic and the Transcendental Dialectic. As I suggested in the introduction above, Kant takes the rest of the Transcendental Analytic to prove that if we are able to prove our thoughts to be true or false of sensible objects, so that deduction becomes

validated, then we must confront a world of objects characterized by definite substantive, causal, and communal dynamic properties. This means that we can always ask Baconian questions about nature, i.e., we can search for and rule out potential necessary and sufficient causes of natural phenomena. In fact, if my suggested reading of the work has merit, then this validates Kant's distinction between judgments of perception and judgments of experience. It has long been a mystery how judgments of perception could remain subjective but involve all the categories – as this would seem to confer on them objective status. But, given my notion of the Table of Judgments as an outline of the moments of proof, this can be so! Though Kant proves in the Transcendental Deduction and Schematism that all perception and representation must fully conform to the categories, this does not mean that we actively take each judgment up into the system of cognition and attempt to *prove* it as necessarily true. For example, Kant's example of a judgment of perception in the *Prolegomena*, "if the sun shines on the stone, it becomes warm,"³⁹ qualifies as a judgment of perception and will remain such unless we subject it to rigorous testing, which means attempting to rule out cases that would disprove that the sun is in fact a sufficient cause of the stone's warmth. Only when we explicitly attach the category of causality in rigorous testing does the judgment count as a judgment of experience.

Now, it has also long been a mystery precisely why Kant needs both the Transcendental Analytic and the Transcendental Dialectic. R. Lanier Anderson expresses this wonderment nicely when he says there has long been

... a puzzling mystery about Kant's "Dialectic." After all, if Kant's primary aim were simply to establish, from within the framework of the *Critique*, that any metaphysics of supersensible objects must exceed the bounds of our cognitive powers, then a much simpler and more straightforward approach was clearly available to him. For it is one of the central theses – maybe the central thesis – of the positive theory of cognition worked out in the "Transcendental Aesthetic" and the "Transcendental Analytic" that all cognition requires both concepts and intuitions, where all (human) intuition is sensible. It follows immediately that no cognition of supersensible objects is possible, simply because it would have to exceed the bounds of possible experience.⁴⁰

Anderson gives one answer to this question, but I would give another. I take it that the Analytic proves that if the world has a certain structure corresponding to our conception of proof, then we can prove our thoughts true or false in the context of our experience. Consequently, it validates the kind of deductive inferences we make. It provides an *a priori* reason for why the mere form of the deductive

³⁹ Imm. Kant, *Prolegomena to Any Future Metaphysics*, edited and translated by G. Hatfield, Cambridge: Cambridge University Press, 2004a, p. 53; Ak 4: 302.

⁴⁰ R. Lanier Anderson, *The Poverty of Conceptual Truth, Kant's Analytic/Synthetic Distinction and the Limits of Metaphysics*, Oxford: Oxford University Press, 2015, p. 327f.

inferences we possess are valid. However, this means that the Analytic does not also prove that we cannot justify the validity of deduction in some way that reaches beyond the realm of experience. Disproving this must be the specific aim of the Transcendental Dialectic. As I suggested above, in the Dialectic Kant proves that we cannot prove our thoughts about entities that must exceed the bounds of sensible experience. Kant attempts to prove this explicitly by demonstrating that, when we employ categorical, hypothetical, and disjunctive inferences for cognition of the soul, world, and God, respectively, taken in themselves, then we inevitably end up using fallacious argument in the form, e.g., of a paralogical inference with four terms instead of the requisite three (B410-13, A500/B528, A576/B/604ff.). The argument in the Transcendental Ideal seems to be more complicated, so far as it involves proving that our judgments about God inevitably refer not to God in Himself but to the relation we establish in cognition, or at least in thought, between the world and God. This is, in any case, how Kant describes the argument of the Transcendental Ideal in the *Prolegomena*,⁴¹ since it is important to him that our metaphysical or Dialectical inferences must nevertheless coalesce around the Ideal of Pure Reason which we cannot cognize with formal validity. The end result of the Analytic and the Dialectic together is that, by both justifying the validity of deduction within the experience of a certain conception of the world and then by bounding the use of deduction to reflection on the use of it in that world, Kant accomplishes two things. He completes our epistemological self-justification as deductive reasoners. And he outlines the form of a metaphysics which we must think and rationally believe, according to which God creates the world, and us, as the rationally self-determinative beings we are. This is, then, what Kant in the *Critique of Pure Reason* says about our relation to the reason that is essential to us as rational animals.

This is obviously an expansive reading of the *Critique* which, after being suggested here, deserves a good deal more thorough investigation. I also believe that Kant's argument cannot be wholly satisfactory. Ultimately, Kant proposes, according to my reading, a specific approach to philosophy. He proposes that we begin with an initial picture of cognition according to which a subject of cognition faces a sensibly given object which it cognizes, so that the subject reflects on the principles of its cognition of such objects. It reflects on the principles or laws according to which such cognition is logically consequent cognition. This seems to be an auspicious way of beginning the *Critique*. However, Kant presupposes,

⁴¹ Imm. Kant, *Prolegomena to Any Future Metaphysics*, p. 108; Ak 4: 357: "But we hold ourselves to this boundary if we limit our judgment merely to the relation that the world may have to a being whose concept itself lies outside all cognition that we can attain within the world. For we then do not attribute to the supreme being any of the properties *in themselves* by which we think the objects of experience, and we thereby avoid *dogmatic* anthropomorphism; but we attribute those properties, nonetheless, to the relation of this being to the world, and allow ourselves a *symbolic* anthropomorphism, which in fact concerns only language and not the object itself."

according to his reading of Christian Wolff, that each and every cognition is structured according to the concepts of reflection. While this seems feasible, it does cause him to import certain assumptions about the language and meaning of logic, specifically about the Aristotelian syllogistic. For example, he assumes that the relations between concepts, namely in concept subordination ('inner' relations), have a given intensional structure, so that a judgment *All A is B* is true if and only if every concept *A falls under* concept *B* (as in the example "all bodies are divisible"). This agrees with the orthodox interpretation of the syllogistic. But this, as it stands, is a contingent assumption taken from the logical tradition. The orthodox interpretation of the syllogistic, moreover, is problematic. As Jonathan Barnes and others show, it comes with well-known problems of existential import. Nor does it qualify logic as a *science*, in the strict sense of science according to which the perfect syllogisms must count as axioms for the derivation of theorems.⁴² To establish logic as such a science would require a different, so-called *heterodox* interpretation of the syllogistic.⁴³ However, putting all these more technical and difficult issues aside, it would be possible for a successor to Kant to make some needed improvements by beginning from a more presuppositionless starting point – by reflecting on the principles requisite for any cognition of a given object, without presuming anything *at all* about the structure of cognition in the first place. This, as it happens, is how Salomon Maimon began his 1794 text, *Essay on a New Logic or Theory of Thinking*.⁴⁴ He believed that this work more faithfully represented and carried forward what Kant had begun with the *Critique* than either Reinhold's *Contributions* or Fichte's *Wissenschaftslehre*, of the same year. It is possible also to find this same basic approach to the critical philosophy in underappreciated but powerful works like Hans Wagner's 1959 *Philosophie und Reflexion* and Werner Flach's 1994 *Grundzüge der Erkenntnislehre: Erkenntniskritik, Logik, Methodologie*. However, the continuation of Kant's thought is a further story.

⁴² See Jonathan Barnes, "The Science of Logic", in *Truth, etc. Six Lectures on Ancient Logic*, Oxford: Clarendon Press, 2007, pp. 360–447 for these two issues.

⁴³ See *ibidem*, and Marko Malink, *Aristotle's Modal Syllogistic*, Cambridge, MA: Harvard University Press, 2013 for this issue.

⁴⁴ See Salomon Maimon, *Essay on a New Logic or Theory of Thinking*, translated and edited by Timothy Franz, Oxford: Oxford University Press, 2024.