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Lambert on moral certainty and the justification of induction

Aaron Wells

Paderborn University, Paderborn, Germany

ABSTRACT

I reconstruct J. H. Lambert's views on how practical grounds relate to epistemic features, such as certainty. I argue, first, that Lambert's account of moral certainty does not involve any distinctively practical influence on theoretical belief. However, it does present an interesting form of fallibilism about justification as well as a denial of a tight link between knowledge and action. Second, I argue that for Lambert, the persistence principle that underwrites induction is supported by practical reasons to believe; this indicates that Lambert is a moderate pragmatist about reasons for theoretical belief.

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Should practical reasons ever influence what we ought to believe? One reason to say yes starts from the idea that moral oughts can sometimes bring along theoretical commitments. For example, Kant holds that we ought to realize the highest good, and that this obligation makes it rational to assume that the highest good is achievable. A second route begins with pragmatic or instrumental oughts, and proceeds through a means–ends principle. An example is the following indispensability argument: belief in the existence of mathematical objects is an indispensable means to doing science, so if you want to do science, you should believe in the existence of mathematical objects.

Much of J. H. Lambert's hefty *Neues Organon* (1764) is devoted to questions of what we should believe in the absence of conclusive reasons. This paper considers two of his answers, with support from his discussions of

CONTACT Aaron Wells  aaron.m.wells@gmail.com Postdoctoral Research Fellow,  Paderborn University, Paderborn, Germany

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celestial mechanics in the 1761 *Cosmologische Briefe*. I argue that Lambert does allow theoretical belief based on practical reasons – but not in the way one might expect.

First, Lambert develops a detailed theory of moral certainty, one that is actually linked to morality – unlike many familiar early modern views, where ‘moral certainty’ just means high credence. Lambert’s discussion has not gotten much attention in the literature, but it is sometimes flagged as a possible antecedent of Kant’s endorsement of belief on moral grounds (Fonnesu 2011, 188; Gava 2019, 71). Section 1 argues that this is not the case: Lambert’s account of moral certainty is compatible with intellectualism about reasons for theoretical belief – that is, the view that only epistemic justification (or truth-related reasons) can influence theoretical belief.¹ Still, it’s worth reading Lambert on moral certainty for other reasons. He rejects what’s now called the knowledge norm for practical reasoning, and ultimately endorses fallibilism about justification. As I discuss, Lambert’s style of fallibilism bears comparison to some of Kant’s texts.

Second, Lambert seeks to justify enumerative induction through the assumption that properties and laws persist across time. In Section 2, I argue that Lambert’s case for this persistence assumption largely depends on its usefulness – if not quite its strict indispensability – for scientific inquiry. So he holds that there are practical reasons to believe in the persistence principle, and therefore rejects intellectualism in favor of a moderate pragmatism. Further, I show how this can be reconciled with Lambert’s views on moral appearance, which could be seen as excluding practical influence on theoretical inquiry.

1. Lambert on moral certainty

The final part of the *Neues Organon*, devoted to ‘Phenomenology’, takes as one main topic moral certainty (*moralische Gewißheit*). The term is used in two senses, however. I’ll call these broad moral certainty and narrow moral certainty.

Broad moral certainty encompasses any case of certainty that does not arise from the kinds of demonstration used in geometry.

¹A note on terminology: intellectualism is sometimes equated with evidentialism, but I think this underestimates the range of possible positions. On the one hand, evidentialism can be combined with non-intellectualism or pragmatism (e.g. Stanley 2005). Conversely, as Meylan (2020, 206) observes, some reject both strict evidentialism and pragmatism. My terminological preference also has historical grounds. Lambert does not focus his theoretical efforts on the concept of evidence. Appeals to *the* evidence – as opposed qualifying this or that cognition *as* evident – arguably come to prominence only near the end of the eighteenth century (Pasnau 2017, 33–35).

Therefore, it does not require distinctively practical or non-epistemic justification, as is found in Kant's discussions of belief (*Glaube*) and moral certainty.²

As for narrow moral certainty, it is one of four species of broad moral certainty. Lambert thinks we can have narrow moral certainty about 'the morality of actions' just in case we have evidence about the 'intention' with which these actions were undertaken (1764/1990 II:410). Here we might expect Lambert to advance a practically grounded assumption of *sincerity*, on the basis of which we reliably form beliefs about the intentions of others.³ But he does not do this: narrow moral certainty is standard epistemic certainty, but held with respect to distinctively practical objects, namely intentions and motivations. The model is the evaluation of testimony, with the paradigmatic case being witnesses (*Zeugen*) in a legal context. Lambert counsels rating agents' credibility based on what we know of their intellectual and practical powers, and how well-informed they are, but he does not mention any general, practical assumption of sincerity (II:396–397; II:409). Though he acknowledges the possibility of insincerity, Lambert's solution is to gather more information about witnesses. He appears confident in the resulting inferences about intentions (II:343). In sum, he gives no reason to think narrow moral certainty involves distinctively practical justification, though we'll see that narrow moral certainty can illuminate how he thinks of the epistemic conditions for rational action.

Before treating broad moral certainty in further detail, let me say a bit more about the objects of certainty on Lambert's view. Certainty is typically a property of a belief. In turn, belief is an attitude that agents can hold with respect to a cognition (*Erkenntnis*).⁴ Since cognitions are propositional, belief can be regarded as a propositional attitude. Testimony, for example, is a cognition we believe (*glauben*) from a particular type

²See KGS 29:778 ('moral belief is as unshakable as the greatest speculative certainty, indeed even firmer'), 24:199–201, 24:734, and Chignell's (2007) discussion. Chance (2019) and Gava (2019) show how, respectively, Basedow and Crusius may have influenced Kant on this score. On the broader history of moral certainty and its significance for Kant, see Fonnesu (2011), Perinetti (2014), Pasnau (2017) and Di Giulio (2024). Translations of the *Neues Organon* are my own, while translations of the *Cosmologische Briefe* largely follow those in Lambert (1976), with modifications noted. For Kant, I use the Cambridge Edition translations.

³I have in mind something like Reid's (1764/1997, 194) 'principle of veracity'. For other eighteenth-century examples, see Perinetti (2014, 269).

⁴Lambert also allows for epistemic attitudes that resemble belief, but are directed at simpler representational states, namely immediate sensations. Sensations are supposed to be partial epistemic grounds of at least some cognitions (NO II:237; II:409). How this works is not clear, so I will focus on cognitions. Note too that for Lambert 'experience' (*Erfahrung*) can mean not only sense perception but also cognitively laden states such as scientific observations (Wolters 1980, 73–81; Watkins 2018, 180–182).

of evidence, namely communication from others (1764/1990 II:409). But agents can have the same attitude of belief towards purely a priori and necessary cognitions, such as Euclid's theorems (II:412). So unlike Kant, Lambert has a broad notion of *Glaube*, with no special connection to practical justification.

A further point of clarification concerns how cognition (*Erkenntnis*) relates to knowledge. The *Neues Organon* often refers to knowing (*wissen*), with cognitions as the associated objects of knowing (1764/1990 I:388). Though it's not clear that cognition and knowing are coextensive, they do often coincide. For example, Lambert thinks that immediate sensory experiences suffice to enable cognition and, correspondingly, that we can 'know ... through immediate experiences,' which are sufficient to yield individual concepts (II:408–409; II:413; I:417–418). As for the nominalized term for knowledge (*das Wissen*), Lambert uses it rarely, and when he does, again tends not to sharply separate it from cognition (e.g. II:397). This is an important difference from Kant's Critical works, where the two terms are emphatically distinguished (Chignell 2007; Watkins and Willaschek 2020).

Let's turn to Lambert's official definition of broad moral certainty, which is negative: broad moral certainty is just any *non*-geometrical certainty (1764/1990 II:408). All certainty is therefore either geometrical or broadly moral. Despite the name, geometrical certainty is not literally restricted to geometry. It just requires the 'form and connection [*Zusammenhang*] of demonstration' that is found in all sciences with strict a priori foundations (II:408). These a priori foundations are 'necessarily true in themselves' and can be conceived independently from experiential evidence about the actual world (I:422; II:412).⁵

A cognition has broad moral certainty, then, if it cannot be demonstrated from purely a priori grounds. Yet cognitions with broad moral certainty, though they lack strict a-priori demonstrations, may still be demonstrable from what Lambert calls relatively or 'more or less' a priori grounds (1764/1990 I:414). A cognition has purely a posteriori grounds if it is immediately derived from experience, and pure a priori grounds if it is not derived from experience at all. Cognitions may also be derived from prior grounds that have a mixed status, such that some of their 'premises' are wholly due to experience and others are

⁵The pure sciences of geometry, chronometry and phonomy correspond to space, time and motion. Lambert also thinks metaphysics is on its way to becoming a pure science (1915, §§ 77–80; 1771, §§ 1–75). I set this complex topic aside here: see further Wolters (1980, 15–28), Laywine (2001) and Wellmann (2018).

not (I:413–414). Lambert gives the example of measuring distances among celestial bodies with a unit determined on earth. Initially fixing the unit of measure involves an appeal to immediate experience. But astronomical measurement brings in a priori premises from geometry, which show us ‘the connection and relation between’ the known unit and the distance we seek to measure (I:391). Propositions stating the results of this measurement have both geometrical premises and experiential premises, so they are only relatively a priori.

Geometrical certainty, we’ve seen, is always complete, but it is not the only kind of complete certainty. Lambert holds that we can attain certainty = 1 on a posteriori grounds, as well (1764/1990 II:419; II:318–319; II:406). To take one example, sensations can be maximally certain, as can consciousness of our own existence (II:382; II:405–407; I:561). Skepticism about sensation rests on a statistical fallacy, Lambert thinks: although the *average* degree of certainty of sensations is well below 1, we must not conclude that *all* sensations have certainty below 1 (II:406). A second, more surprising example is that some cognitions based solely on testimony can acquire ‘complete’ certainty on a posteriori grounds (II:412; II:396; II:419). He therefore holds what Dario Perinetti (2014, 277–283) has called the *equal certainty thesis*: beliefs dependent on testimony can in principle be just as certain as beliefs based on a priori grounds. Therefore, some testimonial beliefs are both completely certain and (broadly) morally certain. This position is ruled out by definition in some earlier thinkers – such as Jakob Bernoulli and Georg Friedrich Meier – who regard moral certainty as the highest degree of certainty below 1 (Bernoulli 1713; 1900-, 16:431–432).

Lambert famously espouses an ideal of systematic cognition, whereby necessary truths form an interconnected, deductive system. But the cases of immediate sensation and testimony suggest that you can know *p* even if you do not have systematic scientific cognition of *p*. While scientific cognition is good if you can get it, some cognitions – for example those based on immediate sensation and some kinds of testimony – appear to be both essentially unsystematic and maximally certain. This has textual support from a passage noted earlier, where Lambert states that we can know (*wissen*) through mere immediate, individual sensory experience (1764/1990 II:413).⁶ Nevertheless, systematicity brings along other epistemic

⁶To be sure, *what* we can know in this way may be relatively trivial and insufficient for science. I take this to be one upshot of Lambert’s account of truth criteria. He seems to grant that *some* truths are immediately knowable, independent of their integration into a system of science – the criteria for knowing them are in our soul – while stressing that this model does not hold for all truths (Lambert 1915, § 88).

virtues, aside from complete certainty itself (see further Watkins 2018; Wellmann 2018; van den Berg 2021). Since geometrically certain truths are also necessary, their certainty may have a special quality or modal status: in Lambert's time, the permanence and counterfactual stability of necessary truths was thought to afford them a privileged kind of certainty (Pasnau 2017, 28–29; Gava 2019, 58). Yet even if Lambert subscribes to such a view, necessary truths would not have a higher quantitative degree of certainty than immediate sensations: both have maximal certainty = 1.

Even though Lambert thinks we can have full certainty = 1 in cognitions that have a posteriori grounds, more usually a posteriori cognitions are to some degree uncertain. Consider general empirical cognitions in natural science. Such empirical generalizations are not completely certain, in the first place, because they typically result from induction. Although induction can in principle produce complete certainty – more on that in the next section – this is rarely achieved (II:324). Another source of uncertainty is that empirical cognitions usually make probabilistic claims, so predictions in accordance with them will have degree of certainty < 1 (II:324).⁷ Yet Lambert insists that probable cognitions, though not completely certain, need not be *uncertain* (*Ungewisse*, II:382).

When Lambert denies that probable cognitions are always uncertain, I take him to be not just noting that their degree of certainty is sometimes above .5, but also alluding to two other epistemic features of broad moral certainty.

The first feature is that it can be rational to act on a cognition that has been objectively shown to be probable, even where we lack complete certainty. Lambert introduces empirical probability through simple cases involving games of chance and lotteries, where he suggests it can be rational to bet based on an objective degree of expectation of just $\frac{2}{3}$ (1764/1990 II:320–321). He is not troubled by irrational consequences that arguably result from betting or otherwise acting on beliefs that are merely probable, rather than fully certain, and applies the same point to probable empirical beliefs. Nor would he agree with a conclusion some contemporary epistemologists draw from betting cases – namely that knowledge, as completely certain, must be the norm for practical reasoning and action.⁸ For further evidence that Lambert denies a close

⁷Lambert does not always cleanly distinguish problems of induction from problems of statistical inference. This may be because the *Organon* apparently assumes relative frequency is always a reliable guide to probability: if I know (*weiß*) the former, then I also know the latter (NO II:323–324).

⁸Hawthorne and Stanley (2008) hold that lottery-paradox cases can be explained if knowledge is a norm for practical reasoning and action (see also Stanley 2005, 9). Suppose I start with the premise that I will lose the lottery, and reason to the conclusion that I ought to sell my ticket for one cent. Hawthorne and

link between complete certainty and action, we can return to narrow moral certainty, or certainty about intentions. 'The intention ... constitutes morality', so to know the moral worth of an action, we need to know the underlying intention (II:410). Since acting typically involves representing an intention, we have somewhat privileged access to our own intentions. But this introspective access is highly fallible (II:410). The intention we represent to ourselves may not be the real cause of the action: instead, it might be due to 'hidden motives' (II:410). Determining the intentions of others is even more difficult. Only external, physical characteristics of actions are accessible to sensation, so we don't have sensory direct access to others' intentions. And while we can communicate intentions, this testimony is not always accurate. We can fail to discern our own intentions, and are not always honest about them. Despite all this, Lambert thinks we often succeed in determining the intentions of others through non-deductive inference (II:343). Inferring intentions requires sufficient information about the circumstances of action and the agent's overall behavior. Assuming we can get this information, he is convinced that our beliefs about others' intentions can attain at least high certainty. He even hints at the possibility of complete certainty here, since he distinguishes 'degrees of' moral certainty from moral certainty per se (II:410). Further support for this possibility, given that we must rely on testimony to know the intentions of others, comes from his assumption that testimony can sometimes suffice for complete certainty. But whether or not narrow moral certainty can be complete, he definitely thinks it is often practically rational to act on our beliefs about others' intentions, even when full certainty about those intentions is lacking. This confirms that complete certainty is not required for rational deliberation and action.

The second relevant feature of broad moral certainty, as Lambert understands it, is that empirical cognitions can track objective or 'absolute probability', thereby having objective epistemic reasons or grounds (1764/1990 II:321; II:319). The objective grounds for holding p are roughly the justification or warrant for p . Objective grounds contrast with merely subjective grounds, which underwrite judgments of what an agent merely finds 'likely' (*vermutlich*). I can be persuaded that a certain outcome has a high degree of likelihood, in this sense, even when I don't have objective grounds (II:319). I might be convinced that

Stanley think this reasoning is irrational because I can't know that I'll lose the lottery, and conclude that I should treat a proposition p as a reason for action only if I know that p .

I am likely to win at the roulette table, and bet all my savings on the outcome, even though my objective grounds entail that I probably won't win.⁹

By contrast, the degree of probability of empirical cognitions is ultimately based in 'laws' in 'the nature of things', which fix the objective 'degree of possibility' of outcomes (1764/1990 II:321). This means that empirical cognitions have objective probability and not just subjective likelihood. Though this language might suggest that the laws of nature are chancy or indeterministic, that is not Lambert's view. The laws of nature are ultimately deterministic, but since they are 'highly complex', we are largely ignorant of them (II:323; also see II:330–331; CB, 227–228). Since our knowledge of the laws is usually incomplete, few phenomena can be directly brought under 'simple and necessary laws': in most cases, we characterize the world as probabilistic or random (1764/1990 II:332; Sheynin 1971, 245–246). Unlike my hunch that I'll win at roulette, our probabilistic account of the world is still based on the laws of nature, and therefore on objective grounds.

So it emerges that even when I have objective grounds for holding that things will turn out a certain way, these grounds are often merely probable, and I might turn out to be wrong. Suppose that before rolling a die repeatedly, I believe on objective grounds that the die will not roll three fifty times over. But this outcome is of course 'not impossible', merely improbable (1764/1990 II:321). In the unlikely event that I do roll fifty threes, my belief is false, even though it has robust objective grounds. Lambert, then, allows that objective grounds for cognition can be fallible.

I've noted that on the rare occasions that Lambert refers to knowledge (*Wissen*), he does not cleanly distinguish it from cognition, and allows a wide range of cognitions to be objects of knowledge. This, combined with his concession that cognitions are not always certain, might suggest a quick route to fallibilism about knowledge: cognitions are fallible; cognitions can be instances of knowledge; therefore knowledge is fallible. But I think we should be cautious here: the nominalized term '*Wissen*' makes only rare and non-technical appearances in the *Organon*. Terminologically, Lambert instead focuses on how objective

⁹This bears comparison to Kant's account of assent from subjective grounds. Kant thinks assent can be the basis for action given sufficient subjective grounds, even when objective grounds are lacking (KGS 24:145–151; 9:68). Chignell (2007, 68) and others read Kant's related notion of *Scheinbarkeit* as denoting merely subjective probabilistic grounds (like my false conviction about roulette). One terminological difference is that '*Überzeugung*', Kant's broad term for assent or conviction, is not used in the *Neues Organon*.

grounds or reasons (*Gründe*) determine the degree of certainty of cognitions, with the paradigm case being systematic, scientific cognition. Once theoretical cognitions are integrated into a system, we have both conclusive reasons for them and full belief in them. What the textual evidence supports is, rather, reading Lambert as a fallibilist about these epistemic grounds or reasons – in contemporary terminology, as a fallibilist about justification.

These last points parallel a current debate in the Kant literature. Andrew Chignell (2021) has argued that Kant is a fallibilist about objective grounds or justification, though not about knowledge. On this reading, I can have objective grounds for assenting to p – in the sense that if p were true, then my assent to p would count as knowledge – even if p actually turns out false. This reading is disputed: Eric Watkins and Marcus Willaschek (2020), among others, read Kant as an infallibilist about objective grounds. I don't mean to settle the matter here. But if Chignell's reading is correct, then there would be at least two important similarities between Kant and Lambert. First, Chignell suggests that transcripts of Kant's logic lectures show he is committed to degrees of certainty, and that this provides a promising way one way to cash out his fallibilism (Chignell 2021, 119–121; cf. 1900-, 24:144; 24:556; 24:743). As we've seen, Lambert's *Organon* explicitly takes certainty to come in degrees. Second, Chignell proposes that infallible knowledge – 'august, high-level *scientia*' – is a worthy goal in Kant's view, yet 'largely out of reach in everyday and empirical science contexts' (2021, 123). Lambert's work provides an interesting point of comparison here. On the one hand, his epistemic ideal is axiomatic *scientia*, which would limn a priori and necessary truths. But he also thinks this ideal is only achievable in restricted, pure domains, leaving most of our cognition merely probable. Rather than drawing skeptical conclusions, Lambert embraces a probabilistic conception of certainty as given by experience, as well as a fallibilist account of objective grounds.

2. Practical grounds for inductive certainty

In the previous section, I argued that even though Lambert's theory of moral certainty deals with questions of moral responsibility, it does not give practical reasons a role in justifying theoretical belief. In this section, I will suggest that practical reasons do play a role elsewhere, namely in Lambert's teleological account of the presuppositions of induction.

We saw that Lambert assumes individual sensations can have complete certainty. He still faces the question of *justifying* more general

propositions from experience. The *Neues Organon* treats numerous modes of non-deductive inference under the heading of ‘induction’, such as reasoning from effects to possible causes or from actions to possible motivations (1764/1990 II:342–343). My focus will be on just one of these modes of reasoning, which we’d now call enumerative induction. Consider this passage from Hume:

It implies no contradiction, that the course of nature may change, and that an object, seemingly like those which we have experienced, may be attended with different or contrary effects. May I not clearly and distinctly conceive, that a body, falling from the clouds, and which, in all other respects, resembles snow, has yet the taste of salt or feeling of fire? (Hume 1748/1975, IV.18)

To take another example, even if all ravens experienced so far have been black, it is conceivable, so not contradictory, that tomorrow we discover that all the ravens have turned white. If there existed any ‘demonstrative argument or abstract reasoning *a priori*’ capable of ruling out this possibility, this would show that the possibility implies contradiction (IV.18). But nothing can show that the possibility implies contradiction, so by *modus tollens*, no such reasoning exists. Hume famously concludes that no ‘reasoning’, only subjective ‘custom’, leads us to think that nature will be the same in the future as it was in the past (V.5).

While Lambert does not mention Hume,¹⁰ he nevertheless considers this kind of worry:

The actual reckoning of cases [*Fälle*] can only be carried out where the inter-linked causes have something constant and definite in their changes. For otherwise it would not be possible to find a constant or definite relation between the cases belonging to each class, if new causes were always manifesting themselves, or if some ceased without being replaced by others of the same kind, or if they lasted only for a short time, as happens in many of a person’s actions. (1764/1990 II:328)

What’s at issue in this passage is not so much whether there exist causes for natural occurrences, but instead whether these causes are *constant and definite*. Lambert is treating a problem, like Hume’s, of regularity across time and space. Although Lambert assumes without explicit argument that every change has an objective cause (II:332), he seems aware that this is not sufficient to ensure the constant and definite character of causes. Instead, he introduces a different principle in order to back induction:

¹⁰In 1770, Lambert harshly reviewed some of Hume’s essays in the *Allgemeine deutsche Bibliothek*. But that was well after the *Neues Organon*, and there’s no evidence that he read Hume’s main publications (Wolters 1980, 19–20).

The concepts and propositions which are directly indicated by sensations are individual. They become general by induction, and the possibility of making such inductions complete, or of inferring from some [particulars] to whole species, occurs insofar as one can apply the principle of persistence. (II:409–410)

This principle of persistence, in turn, states that ‘what has been constant will continue to be, and in the same way’ (II:394). The principle of persistence states that the laws of nature, and core properties of things, will continue to be constant across time. Lambert mentions inferring the properties of ‘whole species’ from a limited sample, so we can take this principle to dictate that across space as well as time, unobserved cases resemble observed cases.

But why assume the principle of persistence is true? Lambert appeals in part to teleology: persistent natural kinds and laws are plausibly means to God’s ends (1764/1990 II:392). In a move that recalls Descartes’ *Principles*, he even raises the possibility of deriving the persistence principle from divine immutability (II:394). But Lambert concludes that our knowledge of divine attributes and intentions does not suffice in practice for such a derivation, though this may be possible in principle (II:391–392; CB viii–ix). Even with the help of teleology, then, merely theoretical grounds provide insufficient justification for the principle of persistence, and thereby for induction.

Here Lambert brings in an additional practical justification of the principle of persistence. The assumption that the persistence principle is true serves ‘as an incentive [*Veranlassung*] to seek out experiences which perhaps would not have occurred to us without such conclusions’ (1764/1990 II:393). He holds that we have a duty to seek the truth, which entails a duty to pursue scientific inquiry (I:iv–v; II:308). To better discharge this duty, we have practical reason to adopt the principle of persistence. But as the ‘perhaps’ in the quotation suggests, and as I discuss further below, he stops short of saying that the principle of persistence is a strictly necessary means for seeking the truth.

In the course of this discussion, Lambert refers the reader to his 1761 *Cosmologische Briefe*, which give a fuller account of how such an incentive works and of why it is needed (1764/1990 II:327). This earlier work also states a Humean problem of regularity. Even if one so far ‘finds no exception’ to a putative empirical truth, that does not provide conclusive reason to ‘extend’ the assumption ‘further than our experience goes’, since exceptions may lie in what has not yet been experienced (CB, 93). One response Lambert considers would be to continue enumerative induction until all cases have been observed. But as Lambert puts it,

someone who wants to see everything before believing will always stick to this question, and it will always take centuries until the experiences, to which I can refer, will become more complete. I could not very well go farther than merely to try, from my own grounds [*aus meinen Gründen*], to add to these experiences. (93, translation modified; also see 84; 147–148; 312)

To return to our example, so long as new ravens keep coming into being – to say nothing of unobserved ravens in the distant past – the justification of induction by this direct route will remain incomplete.

These difficulties are exacerbated in the quest for theories in cosmology and celestial mechanics, a main focus of Lambert's *Briefe*. For example, from a limited table of observation of comets, Lambert seeks to extrapolate a 'law' that 'the comets missing in it, and therefore all comets, must obey' (CB, 209–210; see also 228).¹¹ Indefinitely many mathematical laws might fit the evidence, so curve-fitting problems loom here that do not arise in the simple case of the ravens. Challenges for induction are especially steep for strictly universal mathematical laws for all celestial bodies. The precise value of a law such as Newtonian gravitation cannot realistically be based on a complete induction, since this would require directly observing all the massive bodies in the universe and all their relations. Nor can such laws be 'proven' a priori from our concept of a body (61). Neither inductive evidence nor conceptual analysis can exclude the possibility that the universe is a 'patchwork,' with 'no general law' that 'connect[s] its parts together' (61). Given this predicament, it is tempting to despair of any general, lawlike account of the universe, and to regard even the 'order of planets as fictitious and to conclude once and for all that the true order is the most complicated one and will never be reached by us' (281). Drawing this conclusion would have a chilling effect on future inquiry: if there are no general laws to be found, why look for them? Rather than a 'whole' of scientific cognition, the empirical account of a disordered, patchwork universe can itself be no more than a 'patchwork' of particular doctrines (1764/1990 I:390).

In response, Lambert offers a rule for inquiry: we '*should* necessarily consider [*ansehen*]' everything that happens as stably persisting and as

¹¹He would later publish such a law, partly derived from Kepler's rules, for the time it takes a comet to traverse a parabola (Gray and Tilling 1978, 28–29). Wolters (1985, 146–147) notes Lambert's sympathy with a hypothetico-deductive approach (pioneered by, among others, Boyle and Huygens), where true consequences provide evidence for hypotheses. But Wolters adds that for Lambert, this is largely a method for eliminating hypotheses due to their false consequences (see NO I:359–360). By this route, hypotheses can only be fully verified through a complete 'induction' – in a broad sense – that would consider 'all' their 'possible [immediate] consequences' (II:328–339; compare Kant, KGS 24:220).

‘coordinated’ through general laws (CB, 33; emphasis added). Since it’s possible for us to disregard this principle, it should be taken as articulating a normatively necessary rule, rather than a description of how, necessarily, we in fact consider the world. To the extent that this rule tells us what we ought to do, it counts as practical according to Lambert (1764/1990 II:389). Embedded in this practical rule, however, is a theoretical proposition about the law-governed character of the world.

For Lambert, one important way to follow this rule is to take Newton’s inverse-square law as holding of all matter universally. This law takes the ‘simplest’ (*einfachste*) mathematical form possible, and gives the ‘shortest’ and most ‘convenient’ way to describe not only the solar system but also larger cosmic systems (CB, 97; 114). While Newton’s law has empirical support, it should be stressed that some of the grounds Lambert cites for adopting it are normative and a priori. The normative demand that we ‘should necessarily consider’ the cosmos as law-governed is not itself a product of induction, but stems merely from ‘the abstract reasons of cosmology’ (84). These cosmological assumptions, for example that the world ‘*ought* ... to be necessarily interconnected through universal laws ... give ... the occasion to search for the means’ by which the world satisfies those assumptions (119, emphasis added; 84). The means in question include the actual laws of nature, as well as large-scale structural regularities in the cosmos.

This demand for interconnection leads Lambert to take galaxies and even ‘the whole creation’ as orbiting massive central bodies, on analogy with the solar system (CB, 259). He allows that this conclusion does not follow from physical laws alone. Also needed is an assumption of the ‘preservation of the world-edifice’ (xx; also see 9; 32–34; 198). This resembles the principle of persistence we saw in the *Neues Organon* – but it is stronger, asserting that not only properties and laws but also the large-scale arrangement of matter in the universe remain stable across time (315–316). Leaving aside the merits of this assumption, its purported justification is not limited to the standard teleological line that stability best serves divine ends. Rather, the preservation assumption should be adopted for its epistemic benefits: abandoning it ‘would mean endless complexities’ and amount to ‘taking away everything general in the laws of [stellar] motion’ (306; 222). Lambert’s message is that if we do not adopt an assumption about the cross-temporal stability of the universe, we will have lack the incentive to search for a systematic, scientific account of the cosmos.

Let me note two caveats. One is that Lambert apparently doesn’t regard these assumptions about persistence, preservation and nomic

unity as *strictly* indispensable means to scientific progress. The prediction that without these assumptions, scientific discoveries cannot be made must itself be empirical and probabilistic. New discoveries are in principle possible without these assumptions, even if this might take ‘a few thousand centuries’ (CB, 264). So the practical rationale for the principle of persistence and related norms is in principle defeasible. Second, these norms might be read as only telling us how to subjectively ‘consider’ the universe, such that while they give us reason to hold some beliefs about the universe as ordered, they do not raise the objective probability that the universe *is* in fact so ordered. This point might be reinforced by Lambert’s warning against projecting our ends onto nature by way of (faulty) teleological reasoning (1764/1990 II:393). It may be because of these worries about anthropomorphic projection that he endorses a fallback practical justification of his principle of persistence.

Given these qualifications, Lambert’s position has affinities with what some contemporary epistemologists call *moderate pragmatism*, according to which some, but not all, reasons for theoretical belief or credence are fundamentally practical (Meylan 2020). This view is worth distinguishing from two others sometimes attributed to Lambert. Gereon Wolters (1985) argues that Lambert is a pragmatist in an *instrumentalist* sense, on which all theoretical inquiry is a mere means to practical ends. I remain neutral on this. Instrumentalism so understood is not entailed by moderate pragmatism. Conversely, instrumentalism doesn’t entail moderate pragmatism: if theoretical propositions can only serve our practical ends by being true, then an instrumentalist can be an intellectualist. Both Wolters and Katherine Dunlop (2009) also read geometrical reasoning in Lambert as practical in yet another sense. Euclidean postulates, via our abilities to iterate geometrical objects, provide *maker’s knowledge*, and thereby secure the certainty of geometry. I am not sure this is the right reading of Lambert on geometrical postulates (compare Debru 1977, 43), but even if it is granted, it need not invoke distinctively practical reasons for theoretical belief.

Before concluding, I wish to briefly discuss a possible objection. Lambert’s account of moral illusion or appearance might be taken as ruling out practical justification. What’s distinctive about moral *Schein* is that, as the name suggests, it is rooted in evaluative or broadly practical attitudes, and especially in our attitudes towards the good and the bad (Walschots 2022, 296). This leads us to conflate our subjective, evaluative attitudes with objective epistemic justification. Responding to this threat of practical illusion, Lambert recommends a tough-minded focus on the truth:

The idea that truth always remains truth, whether we like it or dislike it, must be vividly impressed upon us, and must constantly hover in our minds when we examine things, if we wish to ... present what has not yet been proved absolutely regard as no more certain than it really is. (NO II:315)

Maintaining this separation between truth and what we like or dislike often requires postponing the decision to believe or disbelieve until we are able to do so in unbiased tranquility (II:310; II:314). Better to temporarily suspend belief or judgment, Lambert thinks, than to allow mere likes and dislikes to determine our theoretical assent. Based on these passages, Lambert could be read as having an *intellectualist* conception of the grounds for epistemic states such as belief, rather than a moderate pragmatist position.

In fact, Lambert's worries about moral illusion do not rule out practical justification. All practical representations are linked to the agreeable and disagreeable (1764/1990 II:307). The soul can be either active or passive in this relationship and it is only in the passive case that moral illusion threatens. In volition, the soul is active in connection with the agreeable and disagreeable (II:227; II:321). By contrast, in sensations and other passions, the soul is passive in connection to pleasure and pain. What Lambert wants to avoid, then, is not all practical influence on belief, but the excessive dominance of the passions. The soul's passivity, rather than practical influence as such, fosters illusion (II:227; II:312–313). So long as epistemic states have active grounds in the will, rather than passive grounds in the senses, Lambert will not associate them with moral illusion. Since it can be a matter of volition whether we consider the universe as governed by laws and a persistence principle, to consider the universe in this way is not objectionably passive, or mere practical illusion.

3. Conclusion

I have considered the extent to which, for Lambert, practical grounds can underwrite theoretical commitments. The verdict is mixed. I started off in Section 2 by showing that although Lambert develops a conception of certainty specific to moral subject-matter, this does not yet show that he allows distinctively practical reasons for belief. His account of moral certainty in this narrow sense has other aspects worth examining, however, such as its denial of a knowledge norm for action and its fallibilism about justification. Then, in Section 3, I argued that Lambert gives partly practical grounds for induction, with his normative claim that, necessarily, we should consider the cosmos as stable and lawlike, on

pain of giving up the prospects for systematic, scientific cosmology. What I've sketched out does not yet give a full picture of Lambert's epistemology of induction. I have not, for example, filled in the epistemic commitments of considering the cosmos as lawful. But I do take myself to have shown that Lambert permits practical reasons for theoretical belief.¹²

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