

that Francis Bacon's purported dislike of the mathematical method is only a shallow reading of this philosopher, and Lesley B. Cormack insists that practical, applied mathematics cannot be ignored in the historical development of modern science. Finally, Kurt Smith commits to perhaps the most challenging adaptation of all. His text "Leibniz on Order, Harmony, and the Notion of Substance" goes against the usual grain of interpreting Leibniz as a philosopher who subordinated mathematical method to metaphysical principles, and underlines aspects in which Leibnizian metaphysics made good use of mathematics.

This cursory glance of available topics and approaches covered merely a half of the texts that can be found among the pages of this book, and those that we omitted from this review should not be considered any less relevant than those mentioned. They engage with other interesting issues, ranging from mathematical methodology to mathematical realism, offering valuable philosophical analysis and ample historiographical information. However varied the immediate topics of these essays are, and irrespective of how sympathetic their authors are towards the mathematization thesis, an overarching sentiment still emerges, a conclusion that answers the challenge that was initially articulated by the editors. Much like the case of the idea of a monolithic scientific method, the idea of monolithic mathematization at the dawn of modern science is deconstructed into numerous variegated instances that are neither in complete accord with one another nor completely divergent from one another. Mathematics is still seen as being at the root of our science; it is, however, shown that this root has more branches than was previously understood. Thus, while this collection of essays is perhaps not as bold or daring as its title would at first suggest, it is nevertheless interesting, useful and, above all else, true to its promises.

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Epistemic Angst

Radical Skepticism and the Groundlessness of Our Believing

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We ordinarily take ourselves to know many things about the external world. However, radical scepticism, the thesis that propositional knowledge of the external world is impossible, poses a significant threat to contemporary epistemology. Epistemologists have developed various proposals to tackle this threat. Duncan Pritchard, a leading epistemologist, makes his unique contribution. His proposal is significant in three aspects.

First, radical scepticism has two influential arguments, i.e., the closureRK-based and the underdeterminationRK-based sceptical arguments. They are logically independent but equally devastating, and thereby a satisfactory treatment of scepticism should be able to counter them at the same time. However, many anti-sceptical proposals fail to do so. Pritchard's project is unique in this respect.

Second, the sceptical challenge can be easily evaded if one adopts externalist theories of knowledge. However, externalism would concede that we do not have rationally grounded knowledge and that what we have is merely animal knowledge. In a word, the externalist strategy makes a big concession to the sceptic. While internalists aspire to save rationally grounded knowledge, it is easier said than done. Pritchard's book provides an internalist anti-sceptical proposal in which the possibility of rationally grounded knowledge is secured.

Third, the sceptical challenge is posed as if it is a paradox residing in the fundamental tenets of epistemological theories. Hence, it is not enough that we simply rebut the sceptical arguments. To relieve our intellectual worry, we need to diagnose the sceptical problem. A diagnostic anti-sceptical proposal may include the following inquiry. What is the source of scepticism? Is the source innocent or problematic? Where do we go wrong when we take the sceptical paradox as plausible? Pritchard's diagnostic story helps us to resist the sceptical lure.

In his new book *Epistemic Angst*, Pritchard offers a novel approach to solving the sceptical problem.

In the first part Pritchard formulates two forms of sceptical arguments, i.e., the closureRK-

based and the underdeterminationRK-based sceptical arguments for scepticism as follows:

The ClosureRK-Based Sceptical Argument

(CR1) S cannot have rationally grounded knowledge that q (e.g., I am not a BIV).

(CR2) If S has rationally grounded knowledge that p (e.g., I am reading a paper), and S competently deduces from p that q, thereby forming a belief that q on this basis while retaining her rationally grounded knowledge that p, then S has rationally grounded knowledge that q. [The closureRK principle]

(CR3) So, S does not have rationally grounded knowledge that p. (P. 41.)

The UnderdeterminationRK-Based Sceptical Argument

(UP1) If S's rational support for believing that p does not favour p over an incompatible hypothesis q and S knows the incompatibility, then S does not have rationally grounded knowledge that p. [The underdeterminationRK principle]

(UP2) S's rational support for believing that p does not favour p over q and S knows that p is incompatible with q.

(UP3) Thus S does not have rationally grounded knowledge that p. (P. 34.)

He explicitly formulates the sceptical challenge in an epistemic internalist line so that he can establish the conclusion that rationally grounded knowledge (what RK stands for), rather than brute externalist knowledge, is nonetheless possible. When it comes to anti-sceptical strategies, Pritchard argues for undercutting approach over overriding approach. The former approach takes the sceptical challenge as a spurious paradox which will disappear if one exposes the faulty assumptions hidden in the sceptical reasoning; while the latter approach takes the challenge as genuine and hence advocates a revisionary theory. Pritchard notes that two forms of arguments are closely related so that a satisfying anti-sceptical proposal is required to solve the sceptical problems in one attempt.

In the second part, Pritchard is mainly concerned with the closureRK-based sceptical argument. He exposes its underlying commitment to *the universality of rational evaluation thesis* (p. 55). This thesis says that there is no in principle limitation on rational evaluation, such that global rational evaluations are perfectly legitimate. However, in light of the Wittgensteinian account of the structure of rational evaluation, Pritchard argues that rational evaluations are essentially local in the sense that one must first presuppose hinge propositions and then conduct rational evaluations.

Among hinge propositions are anti-sceptical propositions such as that I am not a BIV or that I am not radically deceived by demon. It is for this reason that closureRK-based scepticism is misusing the closureRK principle. In particular, closureRK principle is innocent, but the sceptic is misapplying this principle. This dubious application consists of a rational evaluation from an everyday proposition to an anti-sceptical proposition. After all, anti-sceptical propositions are not under rational evaluations from the Wittgensteinian perspective, and therefore they are not in the market for rationally grounded knowledge. However, the Wittgensteinian approach, as Pritchard sees it, struggles to deal with the underdeterminationRK-based sceptical argument.

In the third part, Pritchard deals with the underdeterminationRK-based sceptical argument. What underlies this form of scepticism is *the insularity of reasons thesis* (p. 55). This thesis says that our rational support for perceptual beliefs, even in the best case, is insular to the extent that our having rational support is compatible with widespread falsity in our perceptual beliefs. To undermine this form of radical scepticism, Pritchard relies on his brand of epistemological disjunctivism which is extensively defended in Pritchard's *Epistemological Disjunctivism* (Oxford University Press, Oxford 2012). Here is the core claim of epistemological disjunctivism (henceforth ED for short):

“In paradigm cases of perceptual knowledge, the knowledge in question enjoys a rational support that is both factive and reflectively accessible (...) the rational support one has for one's knowledge that p is that one sees that p.” (P. 124.)

According to ED, in the good case, one's rational support is one sees that p. This rational support favours one's everyday belief that p over its sceptical counterpart. In particular, Pritchard distinguishes favouring support from discriminating support:

Discriminating support: For any p, q and S, S has discriminating support for her belief that p if she can discriminate the object at issue in p from the object at issue in q, where p and q are incompatible propositions that S is aware of.

Favouring support: For any p, q and S, S has favouring support for her belief that p if p is more likely to be true than q does given S's rational support, where p and q are incompatible propositions that S is aware of.

Crucially, although one's rational support in the good case (i.e., one sees that p) does not provide one discriminating support for one's belief, one is nonetheless provided favouring support for one's belief that

p. After all, seeing that p entails that p. Thus, underdeterminationRK-based sceptical argument is wrong in assuming that one cannot have factive reason in good cases and one's rational support does not favour everyday proposition. Nonetheless, Pritchard notes that ED cannot offer a modest answer to the closureRK-based scepticism.

In the fourth part, Pritchard combines his two diagnoses into a unified anti-sceptical proposal in an undercutting fashion. While the local nature of rational support cannot deal with the challenge posed by underdeterminationRK-based sceptical argument and the factivity of rational support cannot offer a modest answer to closureRK-based scepticism, these two features of rational support are compatible and mutually supportive. Hence, Pritchard argues that rational support can be both local and factive. The bispic proposal has the potential to undercut both dubious theses underlying two forms of sceptical arguments. Overall, the epistemic angst caused by radical scepticism is thus avoided.

This book is clearly written and well structured. It contains illuminating ideas and cogent arguments. What is particularly helpful is that Pritchard compares his novel proposal with other existing anti-sceptical proposals, such as attributer contextualism, abductivism, epistemic externalism, contrastivism, dogmatism, and so on. It is via those comparisons that his own proposal gains dialectical advantages. While the book covers much ground in radical scepticism, some points can be challenged. Recall his discussions of the universality of rational evaluation thesis and the insularity of reasons thesis. He offers a Wittgensteinian account of the structure of rational evaluations and ED to argue against these theses, respectively. One might think that what he merely shows is the weak conclusion that these two theses are incompatible with the Wittgensteinian account and the epistemological disjunctivist account respectively. What he actually aims to establish is,

however, the strong conclusion that the two theses are wrong. For sure, when two things are incompatible, we need more reasons for thinking one thing true and hence reject the other. In this aspect, he could either seek help from pre-theoretic intuitions. For example, he can argue that both ED and the Wittgensteinian account are more in line with our intuitions. This strategy may help undermine the plausibility of the two theses. However, this move may turn out to be dialectically improper for the reason that the sceptic can refuse to accept such intuitions. Alternatively, he can gain help from using some form of transcendental arguments, a strategy recently defended by Wang (Ju Wang, "Radical Scepticism, How-Possible Questions and Modest Transcendental Arguments", *International Journal of Philosophical Studies* 25 (2017) 2, pp. 210–226, doi: <https://doi.org/10.1080/09672559.2017.1296881>). Transcendental arguments, via a prior reasoning, start from a premise that radical sceptics accept and arrive at a necessary condition for the possibility of the premise. Hence, if we are to undermine the *prima facie* plausibility of the sceptical arguments, we can identify some premises that both sceptics and non-sceptics will accept. After that, we use transcendental arguments to establish some necessary conditions for the possibility of the premises. On the one hand, sceptics are forced to embrace conclusions of the arguments given the special characteristic of transcendental arguments; on the other hand, conclusions of such arguments can help illustrate why we have to endorse certain views, such as the local nature and the factivity of rational support. This strategy can provide further strength for Pritchard's proposal so that his strong conclusion can be secured.

Epistemic Angst is a superb book, especially for those who are interested in radical scepticism.

Ju Wang