As Vincent Hendricks remarks early on in this book, the formal and mainstream traditions of epistemic theorising have mostly evolved independently of each other. This initial impression is confirmed by a comparison of the main problems and methods practitioners in each tradition are concerned with. Mainstream epistemology engages in a dialectical game of proposing and challenging definitions of knowledge. Formal epistemologists proceed differently, as they design a wide variety of axiomatic and model-theoretic methods whose consequences they investigate independently of the need of giving counterexample-free definitions of knowledge. Or at least, this is a common way to explain where both disciplines stand in the larger landscape of epistemic theorising, and why interactions between them remain scarce.

The main ambition of this book is to show that the distinction between formal and mainstream approaches should not preclude a fruitful interaction, and that it only takes the right outlook on their respective practices to disclose plenty of room for interaction. To reach the right perspective, Hendricks describes the common core of mainstream and formal epistemology in terms of shared problems and strategies, and sets out to study a set of six paradigm epistemic theories, which then yield a more fine-grained appraisal of how formal and mainstream approaches differ. This common core, Hendricks submits, relates to the problems posed by far-fetched possibilities of error, and especially by their dismissal in a wide range of theories; a strategy he places under the common header of forcing-methods. The six paradigms he singles out are, on the mainstream side, the reliabilist, counterfactual, and contextual ways to study the truth-conditions of ‘S knows that p’. On the formal side, then, we have logical, computational, and modal operator epistemology.
Before setting off with the presentation of each of these particular strategies, a more general introduction to what Hendricks considers the common outlook of most mainstream epistemologies is given. In the initial chapter, which is aptly titled “Priming the Pump,” the reader is not only introduced to the core problems of contemporary epistemology, but is also confronted with the challenge posed by the modal nature of knowledge and the apparent need to be infallible in all possible states of affairs. It is relative to this problem that the method of forcing is described as a means to differentiate the infallibility required for knowledge from the more demanding immunity from error in even the most far-fetched misleading situations. This is achieved by showing that some “possibilities of error fail to be genuine in the relevant sense” (p. 9). As such, this initial version of forcing has an overt Lewisian pedigree: it sticks to a traditional infallible understanding of knowledge, and adheres to the distinction between alternatives that need to be eliminated to acquire knowledge and those we may properly ignore. Unsurprisingly, this is also where formal and mainstream considerations most naturally meet.

Apart from presenting the gist of the book’s main argument, this initial chapter includes a number of useful methodological leads, most importantly (i) the distinctions between global and local underdetermination, categorical and hypothetical accounts of method, categorical and stochastic accounts of reliability, and first- and third-person perspectives on knowledge; and (ii) the central role as well as the pitfalls of the mainstream epistemologist’s use of fictions, intuitions, and thought experiments. Essentially, this last feature is what makes mainstream epistemology widely different from formal epistemology. By contrast, most of the distinctions introduced in this chapter can be used to qualify mainstream as well as formal approaches, and therefore constitute the main toolbox used throughout the remaining seven chapters.

Admittedly, Hendricks’s selection of mainstream approaches is clearly meant to facilitate the transition to formal epistemologies, and it is therefore only a partial rendition of the field as a whole. With this proviso in mind, the choice for reliabilist, counterfactual and contextual approaches is surely defensible. More importantly, it is also sufficiently diverse to make claims about the omnipresence of forcing credible. For the presentation of each strategy, one precise account is singled out as a prototypical example: for the reliabilist account, this is Goldman’s approach which centres on the use of methods which aim at gaining truth and avoiding error at a sufficiently high rate; for the counterfactual account, this is Nozick’s proposal requiring beliefs to be sensitive to or track the truth in counterfactual situations in order to qualify as knowledge; and finally, for the contextual one, this is the variety due to David Lewis’s Elusive Knowledge. As already hinted upon, the emphasis on Lewis’s brand of contextualism is all but a coincidence. As a matter of fact, the importance of his insights for this book can hardly be overstated, and can—together with Hintikka’s work—be considered as one of the main inspirations for the views developed throughout this book.

Having mentioned Hintikka, we are almost ready to step up to the formal side. But first we need to explain how forcing fits into each of the three mainstream strategies. Extremely simplified, one way a reliabilist can incorporate forcing is by specifying that knowledge-yielding methods need only be reliable in normal worlds
(with further room for variation as to where gaining truth and avoiding error need to come in). In counterfactual approaches, forcing comes in at two points: tracking the truth puts some stringent constraints on belief (indeed, a much stronger constraint than reliabilism does) and thus avoids their Gettierization, whereas the proviso that such tracking need only be in place in close worlds, takes care of sceptical concerns. The main ingredient of forcing, up to this point, is the distinction between worlds which do matter, and those which do not. Contextualism is faithful to this distinction, but also modifies it by showing how it need not be seen as a rigid way to partition a modal space, but rather as a context-sensitive criterion that is a function of the conversational context in which knowledge is attributed.

With the topic of logical epistemology, Hendricks starts his investigation of formal approaches with what is perhaps the most explicitly criticised paradigm in formal epistemology. As he points out, logical epistemology is in the awkward position of being a field which started off with a clear philosophical agenda, but whose further development was only successful to the extent that it left its epistemological aspirations aside. It is this odd situation which the chapter on logical epistemology aims to resolve. To that end, logical epistemology is presented with an explicit reference to Hintikka’s initial autoepistemic inspiration. In most contemporary presentations, the starting point of epistemic logic is taken to follow from the Kripke-style semantics of modal logic. Yet, in Hintikka’s own formulation, a largely similar system is obtained by combining model-sets with a notion of epistemic defensibility. This leads to a view on knowledge which requires closure under known as well as under valid implications, and even leads to the philosophically more troublesome acceptance of the KK-thesis of positive introspection. Hintikka’s ensuing adoption of $\text{S4}$ as the correct logic for knowledge is, as Hendricks points out, the result of seeing the role of epistemic logic as the enforcement of a rather demanding standard of rationality. Namely, an agent should avoid epistemic situations which would be rationally indefensible in the sense of being logically inconsequential or incoherent in a Moorean sense rather than in a plainly logical sense.

Seeing Hintikka’s proposal as a formal approach to a particular first-person interpretation of knowledge, it is natural to look at what the alternatives have to offer. Hendricks follows the traditional road of reviewing the main normal modal logics in terms of their strength and most plausible interpretation, but also goes beyond it by looking at deductively weaker as well as at more expressive accounts. In the former class we find non-normal and non-regular modal logics which accommodate the counterfactual epistemologist’s rejection of closure, while in the latter class we find an even wider variety of dynamic proposals meant to overcome the overly static view on knowledge as modelled in the basic modal languages.

The suggestion that static models may, after all, not be distinctively epistemic initiates Hendricks move to the overtly dynamic proposals treated in the chapters on computational and modal operator epistemology. A major motivation for these more technical chapters is the view that learning may be considered as knowledge acquisition. Leaving the technical details aside, it becomes possible to review both these dynamical proposals simultaneously. This is to be expected, for modal
operator epistemology is Hendricks’s own attempt to exploit the core insights of learning theory in a logical setting. Put simply, learning theory investigates methods in terms of their ability to converge to the truth. When combined with modal considerations about the set of worlds at which a method should succeed, a comprehensive space of alternative theories is obtained by varying along three dimensions (Hendricks follows Kelly in using a more fine-grained characterisation, but three dimensions will do for the purpose of this review). These are: (i) kinds of methods: bold Popperian versus skeptical Pyrrhonian ones, (ii) convergence criteria which range from the highly demanding certainty convergence to the more lenient gradual convergence, and (iii) the range of worlds at which a method needs to be reliable in relation to the problem that is specified.

Interestingly, whereas the first two dimensions merely reveal the options we have, the latter dimension also reveals a genuine forcing consideration. Namely, that a method need only to succeed at the worlds consistent with the relevant background knowledge (which is itself a function of the specified problem). This idea is called logical reliability, and states that a method is reliable at the actual world only if it is also reliable at the worlds that are consistent with the relevant background knowledge. Hence, we may conclude that the forcing assumption of computational epistemology is exclusively targeted at a global kind of underdetermination, whereas the possibility to vary in method and convergence-criteria is primarily targeted at local kinds of underdetermination. As a matter of fact, the degree to which a method succeeds to deal with local underdetermination can be seen as a measure of the degree of unsolvability of epistemic problems relative to different success-criteria.

When compared to logical epistemology, computational epistemology develops a distinctively procedural approach with an emphasis on agents who aim at decision and discovery. However computational epistemology is a logically inspired approach to epistemology, its actual implementation does not facilitate a straightforward comparison with mainstream epistemic logic. Hendricks’s modal operator epistemology, by contrast, is meant to capture the same procedural emphasis in a more traditional logical setting. The main insight on which it draws is that it takes more than a single operator to give a realistic model of inquiry. That is, besides the usual epistemic operators which take care of agenthood, modal operator epistemology also includes temporal operators to deal with dynamic phenomena, and alethic operators to handle forcing strategies. Concretely, Hendricks combines the modal logician’s possible worlds semantics with the computational epistemologist’s evidence streams—an input of evidence for a method of inquiry.

This mixture of two concepts allows him to give possible worlds the structure required for interpreting more than one kind of modal operators. More importantly, the resulting framework also enables Hendricks to express what it means for a discovery method to successfully converge, and get a precise grip on different criteria for such success. From this, we can already conclude that modal operator epistemology duly captures the procedural approach of computational epistemology with purely logical tools, but even more can be said. The present framework identifies agents with methods of inquiry, which means that (i) methods are a necessary condition for knowledge, and (ii) which modal axioms are satisfied by the
relevant knowledge operators is made dependent on the method and success-criterion one presupposes. Clearly, in this conception agents have really become active agents, and a precise connection between modal systems, methods of inquiry, methodological recommendations, and convergence criteria is obtained. As this framework also retains the forcing-condition that methods only need to be successful in those worlds consistent with the agent’s actual evidence, modal operator epistemology surfaces as a synthesis of the static logical and the dynamic computational epistemology combined with a clear forcing component.

Considered as a whole, we should not reduce the present book to its introduction of the forcing-strategy, or to the mere correction of a wrongly conceived relation between formal and mainstream strategy. While this is the most obvious result of Hendricks approach, it is a mistake to identify its contribution to the mere rectification of how both fields have long been perceived. Additionally, and this comes most explicitly to the fore in the final chapter on “plethoric” epistemology, it also shows how the rediscovery of a shared core may ultimately be beneficial for practitioners on both sides of the divide. Modal operator epistemology is one example of how insights from different domains can be fruitfully combined, but it is at the interplay between mainstream analysis and formal modelling that we get the highest pay-off. Two more general examples illustrate this.

A first example bears on the role of intuitions in the mainstream epistemologist’s practice of conceptual analysis. The point Hendricks wishes to emphasise in that respect is that the production of counter-examples depends on intuitions about what is possible, but this ultimately rests on how spaces of possibilities are structured. This is where formal epistemology comes in, for logical, topological or other formal tools are by far the most solid tools to structure and evaluate the mainstream epistemologist’s use of modal intuitions, and ultimately prevent then from becoming self-fulfilling prophecies. A second example is the generalisation to all the epistemic theories outlined in this volume of the result that in modal operator epistemology the satisfaction of modal axioms bears on strategies and success-criteria. Concretely, it is shown that when relativized to the relevant perspective (i.e., first vs. third person), the modal axioms of epistemic logic become a means to classify epistemic theories. Such an identification of “parameters with respect to which formal and mainstream epistemology meet” (p. 163) are central to the plethoric epistemology Hendricks has in mind.

By way of conclusion, it is useful to draw attention to the seemingly paradoxical aim of this book. On the one hand, the book is expository and tries to give a concise overview of epistemic theorising. On the other hand, Hendricks clearly wants to do something new: he wants to remodel the relation between mainstream and formal epistemology, and defend the central role of forcing for epistemic theorising in general. This is perhaps an overly ambitious aim for a relatively short monograph. Still, the hybrid character of this book is also one of its major strengths, and it is hard to see how one could even merely sketch how formal and mainstream epistemology could be reconnected without a solid overview of several paradigms. When evaluated as a way to set the agenda for how future research at the interface between formal and mainstream epistemology should proceed rather than as an exhaustive and fully detailed proposal for how one should construct bridges
between formal and mainstream epistemology, the above worries easily dissolve. In that perspective, the present book can, due to its accessible style, serve as a textbook for an alternative introduction to epistemology, and, by using the criteria it proposes to compare formal and mainstream theories, as a guide for further exploiting formal methods in a philosophically engaging way.