



David J. Stump*

The Kantian Elements in Arthur Pap's Philosophy

<https://doi.org/10.1515/jtph-2020-0013>

Published online October 30, 2020

Abstract: Arthur Pap worked in analytic philosophy while maintaining a strong Kantian or neo-Kantian element throughout his career, stemming from his studying with Ernst Cassirer. I present these elements in the different periods of Pap's works, showing him to be a consistent critic of logical empiricism, which Pap shows to be incapable of superseding the Kantian framework. Nevertheless, Pap's work is definitely analytic philosophy, both in terms of the content and the style. According to Pap, the central topics of analytic philosophy concern meaning, modality, and analysis. Pap was also influenced by pragmatism, especially in his dissertation, although he does not fully embrace it in either its classical or its Quinean form.

Keywords: Arthur Pap, Ernst Cassirer, *a priori*, analytic philosophy, neo-Kantianism

1 Introduction

Arthur Pap studied with Ernst Cassirer at Yale, writing a Master's thesis under his supervision. He then returned to Columbia where he had received his undergraduate degree, to earn his Ph. D. under the supervision of Ernest Nagel. One might wonder if either Cassirer, the neo-Kantian, or Nagel, the logical empiricist with a pragmatist streak,¹ had a lasting influence on Pap, given that his oeuvre is

¹ Nagel is a complex figure and hard to categorize. He studied under Morris R. Cohen, who could be described as a rationalist and his early work includes some very important historical pieces on mathematics. Nagel often worked on philosophy of science, writing an important textbook rather late in his career, thus I label him a logical empiricist. His connection to pragmatism includes teaching Dewey's Logic (Dewey was his colleague at the time), writing three articles about Dewey's logic, and having a close relationship with Sidney Hook.

*Corresponding author: David J. Stump, PhD, Philosophy, University of San Francisco College of Arts and Sciences, San Francisco, CA, USA, E-mail: stumpd@usfca.edu

analytic philosophy², with some philosophy of science as well. I will argue that Pap retained Kantian elements in his philosophy, even though some claim that he turned decisively towards empiricism. I will take up the following questions here: Did Pap retain Kantian elements after his early articles, which were written at the time that he was working with Cassirer? If we classify Pap's work as analytic philosophy, is that incompatible with Kantianism? What does Pap see as the central elements of analytic philosophy?

Pap was born in 1921 in Zurich where his father had a successful business. As Jews, the family found it necessary to immigrate to the United States to flee the rise of the Nazis in Europe. Young Arthur Pap had completed high school in Zurich, studying philosophy and the sciences. He studied piano at Juilliard for one term before turning to philosophy at Columbia. Of course, Cassirer and Nagel were also immigrant Jews interested in both science and philosophy. Each of these scholars had a strong influence on Pap at the start of his remarkable career during which he published five books and more than 50 articles before dying of kidney disease at the age of 37. In 1953/54, he was in Vienna as a visiting Fulbright scholar and made a very strong impression there, but was unable to obtain a permanent position (Stadler 2014, p. 21).³ Pap returned to the United States to finish his career at Yale.

2 Competing Claims About Pap

At least one author has claimed that Pap definitively turned his back on Kantianism. Brand Blanchard, writing an epilog and memoir in Pap's *An Introduction of the Philosophy of Science* (1962), says that Charles Stevenson drew Pap away from Kantianism.

After obtaining his bachelor's degree at Columbia, he was still interested enough in speculative philosophy to be drawn by Cassirer to Yale, where he proceeded to a master's degree. But by this time the empiricist antibodies were working strongly in his blood; his budding interest in analytic philosophy was encouraged by Charles Stevenson, and he found that Cassirer's metaphysical speculation held little appeal for him (1962, p. 427).

² Analytic philosophy is a very nebulous term, covering a lot of different styles and content. It is not a specific program such as the Vienna Circle, which had a manifesto. Nevertheless, in the period that Pap was actively writing, it meant something. Pap defines himself as doing analytic philosophy and he wrote textbooks outlining what analytic philosophy is (Pap 1949c, 1955).

³ See Pauline Pap (2006b) for a moving account of Arthur Pap's life and career.

We do know that Pap took courses from Stevenson and that he turned to analytic philosophy when it came time to produce his philosophical works, but we find nothing in the record of what we know of Pap indicating that he became disillusioned with Cassirer. It also seems rather contentious to refer to Cassirer's work as metaphysical speculation. Beyond that, there is also little evidence that Pap became an empiricist in any sense of the term. Indeed, we will see below that he maintains that there is a rational element in our knowledge, something we learn by intuition. Stanford Shieh notes this in his insightful introduction to a recent collection of Pap's papers (Pap 2006a):

This leads Pap to a surprising Kantian conclusion [that there are synthetic *a priori* propositions]. It should be clear that this conclusion is Kantian not merely because Pap uses the words 'synthetic *a priori*' . . . Pap's view is genuinely Kantian because his point is that we can never eliminate from epistemology propositions that we come to know not on the basis of experience, nor by (discursive) reflection on concepts, but in virtue of intuitive insight into their truth (Shieh 2006, p. 27).

Shieh seems to be referring to Pap's later work, especially *Semantics and Necessary Truth* (Pap 1958). He is correct that Pap is led there to a genuinely Kantian perspective, but I will argue that there are Kantian (or neo-Kantian) elements throughout Pap's work, from the very beginning to the end.

3 Pap's Early Articles

Prior to his dissertation, Pap published two articles in the *Journal of Philosophy* (1943a, 1943b) and one in *Philosophical Review* (1944), a remarkable accomplishment for a graduate student. Pap cites Cassirer in these early articles, but not elsewhere. Cassirer is clearly present in Pap's thinking at the time and the topics of the articles—necessity, universality and the *a priori*—show that Pap is working within a Kantian framework. In the last article, called "The Different Kinds of A Priori," Pap distinguishes three kinds of *a priori*, all of which exist in his view. He calls the first the formal or analytic *a priori* and it includes all tautologies and other analytic truths. Next is the functional *a priori*, statements that play the role of *a priori* knowledge but are hypothetical or conditional, that is, they are "predicable of conceptual means in relation to objectives or ends of inquiry" (1944, 2006a, 57). Pap's work on what he called the functional *a priori*, which he develops in his dissertation, focusses on fundamental principles of science that are hardened into definitions and act as criteria for further inquiry. Finally, he advocates for what he terms a material *a priori*, that is a synthetic *a priori* that is supposed to be self-evident. Here Pap says that he avoids using the term 'synthetic *a priori*' because

some of Kant's synthetic *a priori* is actually the functional *a priori*, that is, constitutive while changing status in different contexts. Pap's main examples of the material *a priori* are the principles of logic themselves. Summing up, Pap's three early articles treat Kantian subjects and he refers to Cassirer in them. It is worth noting that he also makes quite a few references in these early articles to pragmatists as well, especially Dewey and C. I. Lewis.

4 Dissertation: *The A Priori in Physical Theory*

In Kant's theory the *a priori* is fixed, certain, and universal. The *a priori* is constitutive in the sense that it is a necessary precondition to inquiry. Many in the twentieth century considered a view where what is considered *a priori* can change over time, thereby accounting for scientific revolutions. For example, while Euclidean geometry is necessary and *a priori* in Kant, the geometry of spacetime has variable curvature in Einstein. Reichenbach expressed the idea of a changing *a priori* in 1920, in *The Theory Relativity and A Priori Knowledge* (1920/1965), the key point of which is that there are two meanings of *a priori* in Kant, necessary and constitutive. Reichenbach argues that we should think of the *a priori* as constitutive rather than necessary, given that it can change over time. Schlick almost immediately convinced Reichenbach to give up the idea of a changing *a priori*, a story well told by Paolo Parrini (1998) and Michael Friedman (1999, 2001). Schlick saw Reichenbach's idea as a modified Kantianism, while he argued for what he considered to be a strict empiricism. In developing his own alternative theory of what had formerly been *a priori* knowledge, Pap was strongly influenced by the pragmatists C. I. Lewis (1923/1970, 1929) and John Dewey (1938/2008). I fill out the details elsewhere (Stump 2011, 2015), surveying the differing types of changing *a priori*, from the early writings of Reichenbach, C. I. Lewis, and Cassirer to the contemporary writings of Friedman, Kuhn, and Hacking. Although Reichenbach's view of the relative *a priori* was revived first, (it had the biggest impact on Friedman) I agree with Franco (2020) who argues that Lewis's conception is actually more promising for addressing contemporary concerns.

In Pap's account of the functional *a priori*, what starts out as empirical knowledge can end up being fixed and taken for granted, that is, it can function as *a priori* knowledge, or as I would prefer to say, it can be constitutive, that is, it can be a required pre-condition to further inquiry. A good example of a pre-condition is the calculus being needed to do Newtonian physics. Of course, mathematics is a non-empirical science, so it did not start out as empirical, which Pap thinks is

typical of functionally *a priori* principles.⁴ A prominent example that Pap uses is the law of free fall. One can measure the force of gravity (Cavendish), but once the law is established, it is used as a definition of free fall, given that anything that falls at a different rate is assumed to have an additional force acting upon it. The most important thing to note is the temporal aspect of this conception of the *a priori*, such that a principle that started out as provisional and empirical will be treated as *a priori* at some other point in time or in some other context. On this view, everything is ultimately provisional, although some elements of our knowledge must be taken as fixed at a given point in order to pursue further inquiry. There is no mention of there being particular kinds of principles that are likely to function as *a priori* elements. As Pap emphasizes in the introduction to his dissertation, the temporal aspect of functionally *a priori* knowledge is the key point that solved the problem that he saw with the logical empiricists' treatment of the *a priori*. There are elements of our knowledge that do not fit neatly into either of the logical empiricists two categories:

The dictum that in so far as a statement is *a priori* it is verbal and “asserts nothing about reality” and in so far as it is synthetic it may be refuted at any moment by experience, always left me with a sense of mental discomfort. After several attempts at rehabilitating the honorable status of “synthetic *a priori*” propositions had failed, the conventionalist writings of Duhem and Poincaré, and especially Victor Lenzen's *The Nature of Physical Theory*, helped me to locate the trouble. If, as methodologists, we adopt a static point of view, and examine the body of scientific propositions as it may be found systematized at a definite stage of inquiry, we will, indeed, successfully divide it into analytic and synthetic propositions, as forming mutually exclusive classes. If, however, our point of view is dynamic or developmental, we shall find that what were experimental laws at one stage come to function, in virtue of extensive confirmation by experience, as analytical rules or “conventions,” in Poincaré's language, at a later stage (Pap 1946, p. vii).

Thus, Pap's key insight is that the status of scientific statements can change over time and from one context to another. The result is that while there is no *a priori* in the traditional sense, there still are and must be scientific statements that play the role of principles and function as *a priori* knowledge, even if they were originally empirical.

Can this view be called Kantian? Has he given up on any form of “material” (or synthetic) *a priori*? What would Cassirer say? Neo-Kantianism formed a context for the work of the pragmatists, the Vienna Circle and Poincaré, grounding the

⁴ A further complication here rests in controversy over whether or not Newton actually made use of the calculus in the *Principia*. It seems the current expert opinion is that he did, but the relevant point is more subtle, namely that as physics developed, what became “Newtonian mechanics” in the nineteenth century requires the calculus, regardless of what Newton used in the *Principia*.

pragmatist focus on the human element of knowledge and providing the basic distinctions between the *a priori* and empirical and the analytic and synthetic. Neo-Kantianism was also an influence on Pap's functional theory of the *a priori*. Indeed, Pap, in "On the Meaning of Necessity," claims that Cassirer's interpretation of Kant is a version of his own functional theory of the *a priori*: "Cassirer tends to assimilate Kant's doctrine of the *a priori* to the functional-pragmatic interpretation of the *a priori*" (1943a/2006a, 53). Pap does not see any conflict between Cassirer and the pragmatists on the functional account of the *a priori*. He relates Lenzen's views to Kant as well in the following passage, which also underscores why the term *a priori* is problematic:

Lenzen is Kantian in so far as he acknowledges that universal principles enter as essential determinants into what the physicist declares as "reality." These "constitutive conditions of experience," however, are, for Lenzen, "synthetic *a priori*" only in the crooked sense of being, on the one hand, empirically grounded, and on the other hand, *a priori* in their 'constructive function.' (Pap 1946, 21)

That is, universal principles are synthetic in so far as they are empirically grounded. They are statements about objects in the real world, but they are *a priori* only in a functional sense, given that they are neither certain nor known through a special intuition, thus sharing almost none of the characteristics of what has classically been called *a priori* knowledge. Contrary to the view of the logical empiricists, however, they are not simply analyzable in terms of meaning as analytic statements.

5 Cassirer vs. Nagel

In Pap's acknowledgment in his dissertation, there is an interesting asymmetry between his comments on his two professors, in that he thanks Nagel for his frequent criticism of his work, whereas Cassirer is described as having a wonderful personality.

I am indebted to Professor Ernest Nagel for many clarifying instructions and discussions. I hardly exaggerate in confessing that I owe my conversion from the metaphysical "pathos of obscurity," bred by careless and pompous ways of using language, to conscientious endeavors of clear, rigorous thinking mainly to his philosophical influence on my mind. The portions of the present work that owe their final shape to his unrelenting criticism are too numerous to admit of detailed description (Pap 1946, p. v).

On the other hand, we get this description of Cassirer in Pap's acknowledgment page:

My discussion of Kant's "transcendental analytic" has been inspired by late Professor Ernst Cassirer's illuminating interpretations of Kant. The writing of the present work was begun, in 1944, at Yale University, under the friendly and encouraging guidance of the late German scholar. If this were the place for autobiographical details, I would express the great pride I take in having been privileged to be a focus of so much serenity and sweetness which Ernst Cassirer radiated in personal intercourse (Pap 1946, p. v).

The contrast presented between Nagel and Cassirer could hardly be starker. Pap sincerely thanks both of them, but Nagel was clearly a tough taskmaster while Cassirer was kindly and gentle. The first version of Pap's dissertation is available at the Arthur Pap Archive in Vienna. It deserves careful comparison with the published version. From my preliminary reading of it, there are indeed major changes between the two versions. It would be especially interesting to see whether the first version of the dissertation has more Kantian elements from Cassirer, whereas the final version has more influence of pragmatism. However, we have already seen that Pap claims that Cassirer's views are compatible with the functional *a priori*, so it may be difficult to see the difference in the two positions, given how both are being interpreted by Pap.

6 Pap's Middle Works

Following several papers on various topics in the late 1940s, and book on analytic philosophy in which he sets out what he sees as its central elements (1949c), Pap returns to Kantian themes and writes two papers on the *a priori* in 1949, one on the status of logic (1949a) and another critical of the logical empiricist view that all *a priori* propositions are analytic (1949b). By 1950, even though the topics of his papers are by now firmly in analytic philosophy, Pap was willing to explicitly express his view in Kantian terms. He embraced the term 'synthetic *a priori*' knowing that it would be controversial and argued that there must be an element in our knowledge that falls under this category.

I have deliberately postponed the dropping of the bomb to the concluding section of my paper, lest I prejudice from the outset my chances of getting an impartial hearing. Here is the bomb: if by a synthetic proposition you mean a proposition not deducible from logic alone, and by an *a priori* proposition you mean one that is not empirical, and if you define logic by means of an enumeration of a set of concepts called "logical constants" – to which there is no alternative in the absence of a satisfactory general definition of "logical constant" – then you have to accept the conclusion that synthetic *a priori* propositions are acknowledged whenever the territory of logic expands. And it appears, then, that in "reducing" the non-geometrical parts of mathematics to logic, the logisticians have not eliminated the synthetic *a priori* from mathematics; they have merely dislocated it to those regions where mathematical and logical concepts make definitional contact (Pap 1950, 2006a, p. 203).

Pap adds in a footnote:

I do not intend to resuscitate the ghost of Kantian epistemology by using this Kantian expression, and would be sorry if my terminology had this effect. I would justify my usage by pointing out that the term “synthetic” as well as the term “*a priori*” is in good standing with philosophical analysts who are fully emancipated from metaphysics; so why should the term “synthetic *a priori*” be disreputable? If, indeed, the term “analytic” is used so broadly, as, e.g., in C. I. Lewis, that any statement which can be established by reflecting upon meanings is analytic, then “analytic” becomes synonymous with “*a priori*” or “non-empirical” and the thesis of the analytic character of all *a priori* truth becomes irrefutable on account of triviality.

While Pap may not intend to revive Kantianism, his use of the term synthetic *a priori* clearly cannot be seen as innocuous. He is taking a stand against logical empiricist orthodoxy and supporting a Kantian position, even if he has limited the scope of the synthetic *a priori* considerably by arguing that only logic fits into that category. The existence of a synthetic *a priori*, no matter how limited, raises Kant’s question all over again—how is it possible that there is synthetic *a priori* knowledge. Here again, Pap will provide a neo-Kantian answer, that it is intellectual intuition that grounds our knowledge of logic.

During Pap’s visit to Vienna he writes another book on the elements of analytic philosophy (Pap 1955), this time in German and with the help of his assistant Paul Feyerabend. Feyerabend wrote up Pap’s lecture notes, which allowed Pap to produce a book in record time. The topics generally speaking follow those of the Vienna circle, starting with the criterion of meaning, but he also includes a chapter on explanation, which was a topic from the 1950s.

7 Pap’s Later Work

In *Semantics and Necessary Truth*, Pap rejects the logical empiricist rejection of Kant in two ways (Pap 1958, p. 89). Pointing out first that in order to formulate the logical empiricist (or modern empiricist) position that all necessary or *a priori* statements are analytic and all synthetic statements are empirical, one must adopt the Kantian vocabulary and distinctions. Secondly, the very project of philosophically reflecting on the conditions of the possibility of knowledge is a Kantian project. Thus, the logical empiricists end up continuing the Kantian project in some sense, rather than rejecting it. Of course, to be fair, the existence of synthetic *a priori* (and necessary) statements is rejected by the logical empiricists, and such statements were central to Kant’s project. Still, Pap has a point, and he furthers it by making a case that the attempt to show that all necessary truths are analytic

fails. Specifically, he argues that a narrow interpretation of the word analytic, statements that are demonstrable on the basis of definitions and principles of logic alone, faces unsurmountable difficulties, such as defining logical truth independently of entailment or necessity in order to avoid a circular definition. On the other hand, he argues that a broader interpretation of the word analytic, in which statements are true by virtue of meaning alone, the thesis that all necessary statements are analytic becomes true but trivial. Without going into the details of the argument here or even passing judgment on whether or not Pap succeeds in undermining the logical empiricist or modern empiricist project, I can point out that Pap clearly is attempting to defend Kant, or at least criticize the critics of Kant.

For the purposes of this paper, it is enough to show that Pap maintained a Kantian or neo-Kantian element and that he did not become a strict empiricist or logical empiricist. Pap continues his critique with quite specific arguments against the logical empiricist distinctions, using conceptions formulated by the logical empiricists themselves:

For a logical empiricist, belief in synthetic *a priori* knowledge is tantamount to confusion of the *a priori* and the factual. This dualism, expressed by the dictum “necessary statements say nothing about reality,” is found to be undermined by three central notions developed by empiricists themselves for the purpose of logical reconstruction of scientific knowledge: ostensive definition, implicit definition, and reduction sentence (Pap 1958, pp. 90–91).

Pap ends up with a position here that is reminiscent of pragmatism. He argues for gradualism in the distinctions between analytic/synthetic and necessary/contingent statements (Pap 1958, pp. 91), which is in line with what Dewey would say about these dichotomies, given that all of the dualisms of traditional philosophy are undercut in this way on his view (e.g. Dewey 1925/2008, p. 268–9).

As Shieh notes, Pap ultimately defends use of intuition. In the final section of *Semantics and Necessary Truth*, Pap argues that analytic philosophy is impossible without it and that it is justified in the same way that the use of perception is justified in empirical science. Philosophers have a common understanding of logical necessity and possibility, Pap argues, and if they did not, we could not even begin to analyze concepts. For example:

the only condition on which Tarski's explication of the concept of truth can be regarded as an explication of the conception ordinarily associated with the word “truth,” rather than as a construction of a concept which is arbitrarily named “truth,” is that the equivalences of the form “p' is true if and only if p” which he stipulates as material conditions of adequacy express necessary propositions according to the ordinary usage of “true.” If their necessity were not pre-analytically evident, their selection as adequacy criteria would be arbitrary and unrelated to the aim of clarifying a concept already in use (Pap 1958, p. 421).

A pre-existing understanding of the concept of truth, or more precisely, the necessary conditions of any concept of truth, is required to make analysis of the concept of truth possible, otherwise, we are just stipulating the meaning of an arbitrary sign. This is essentially a Kantian transcendental argument, applied to a topic in analytic philosophy. There must be something in place that allows analysis to move forward, and this pre-existing understanding would have to be known by some kind of rational intuition. Pap's argument here is one of the most explicitly Kantian moves in his oeuvre, exhibiting both a Kantian form and a Kantian result.

As I said in the beginning, Shieh is correct in his view that Pap maintains a Kantian influence that originates with Cassirer. Shieh uses this influence to explain Pap's critical attitude towards logical empiricists, despite the fact that his work is deeply engaged in a dialog with them, and correctly puts the focus on Carnap, whom Pap saw as carrying the logical empiricist project as far as it could go.

Let me conclude by offering a general characterization of Pap's philosophical work. Mary Hesse once described Arthur Pap as a "logical empiricist with a bad conscience" (Hesse 1966, 456). To my mind, this is true as far as it goes, but its emphasis is not quite right, nor does it go far enough. Much of Pap's bad conscience derives, as I have suggested, from allegiance to Cassirer's neo-Kantianism. Pap wouldn't give up this allegiance because he saw a deep tension in logical empiricism at its very best, namely, in the work of Carnap. The tension is between Carnap's adherence to the picture of rational inquiry underlying his continued insistence on an analytic-synthetic distinction, and his attempt to be thoroughly pragmatic, as manifested in his adoption of the Principle of Tolerance (Carnap 1934/1954, 51ff)" (Shieh 2006, p. 43).

Rather than seeing Pap as a logical empiricist who cannot quite accept all of the doctrines of that movement, it would seem more appropriate to see him as a neo-Kantian who is engaging in debate with the philosophy of his time, that is with analytic philosophy. Logical empiricism, especially as elaborated by Carnap, contains a limit beyond which Pap will not go. Shieh elaborates on the tension that he thinks Pap saw in the work of Carnap as follows:

What Pap, along with Quine, saw, was that a truly thoroughgoing pragmatism cannot countenance any standards not open to empirical revision, and, equally, a truly thoroughgoing commitment to rationality in inquiry cannot make sense of the possibility that the rules defining inquiry could themselves be changed in response to the empirical evidence they make possible. Quine went with pragmatism, thereby giving up a deeply entrenched conception of rationality. Pap took the other horn of the dilemma, and came to hold that logical empiricism has limits beyond which empiricism cannot go, where there lies nothing other than intuitive knowledge of logic itself." (Shieh 2006, p. 43)

Thus, Pap argues that there is a foundation or starting point of our knowledge which seems necessary to make sense of inquiry itself. If everything is set aside as

not yet known, there is nothing left to inquiry with. We need to start with something. Pragmatists would claim that you can conduct inquiry using provisional tools that are taken for granted for the moment but still considered as fallible and thus open to inquiry in some other context. Pap does not take the pragmatist path, but instead argues for the necessity of some fixed starting point. Logic is certainly a good place to look for such a principle, if we consider how difficult it is, for example, to avoid a principle such as *modus ponens*. It would seem that such a basic principle is hard to justify as well, except to say that it is obvious.

8 Conclusion

Even though Arthur Pap is thoroughly engaged in analytic philosophy, arguing with logical empiricists on the one hand and ordinary language philosophers on the other (Pap 1949c, p. ix), he remains committed to Kantian forms of argument, whether in his interpretation of the a priori or in his defense of intuition. I propose that we read Pap's foray into analytic philosophy as defined more by the topics about which he chooses to write, rather than a commitment to a set of doctrines. Looking at the titles of his articles alone, his work practically defines what it is to work in analytic philosophy in the post war period.⁵ However, we cannot take the titles alone to indicate what Pap believed, given that he was always critical as he was writing about these topics.

To answer my original questions, Pap clearly does retain Kantian elements after his early articles, which were written at the time that he was working with Cassirer. First, there is a Kantian element in all of the versions of the relative *a priori*, since Kant set out the idea that the a priori is constitutive. The constitutive element is missing from the strict empiricism that Schlick advocated, for example, but the pragmatic, relative, dynamic, and functional *a priori* are all seen as constitutive. Second, Pap defends the view that there are synthetic *a priori* elements of our knowledge using Kantian forms of argument. As to whether or not Pap's work in analytic philosophy is compatible with Kantianism, clearly, they are. The positions that he takes are neo-Kantian, but the subject matter and style are that of analytic philosophy. Finally, according to Pap, the central topics of analytic philosophy have to do with meaning, modality, and analysis, which is why so much of his work consists of explications of key concepts in philosophy, such as necessity, truth, explanation, value, probability, etc.

Pap was also influenced by pragmatism, especially in his dissertation and related works on the functional *a priori*, although he does not fully embrace

5 See the complete list of Pap's publications by Alfons Keupink in (Pap 2006a, pp. 375–379).

pragmatism in either its classical or its Quinean form. Indeed, Pap's view on pragmatism seems to change over time. He embraced pragmatism in his dissertation, but as Shieh points out, he turns away from a thoroughgoing pragmatism in his later work, in rejecting Carnap's principle of tolerance. Logic is treated as intuitively given, rather than something we choose for pragmatic reasons.

Acknowledgments: I thank Sebastian Luft and Massimo Ferrari for organizing the conference Cassirer's Children in Turin, where work on this paper originated. I also thank the participants in the conference for helpful discussion. I also gave a version of this paper in Vienna as the First Arthur Pap Annual Lecture and thank Friedrich Stadler for inviting me. The audience in Vienna also provided useful discussion of the material. In addition, the comments of two anonymous reviewers helped improve this paper considerably.

References

- Blandshard, B. 1962. "Epilogue: A Memoir" in *Arthur Pap, an Introduction to the Philosophy of Science*, 427–31. Glencoe, IL: The Free Press.
- Carnap, R. 1934/1954. *Logische Syntax der Sprache*. (Wien, J. Springer) *Logical Syntax of Language*. London: Routledge & K. Paul. Translated by Amethe Smeaton (Countess von Zeppelin).
- Dewey, J. 1925/2008. *Later Works of John Dewey, Volume 1, 1925, Experience and Nature*. Carbondale: SIU Press.
- Dewey, J. 1938/2008. *Later Works of John Dewey, Volume 12, 1938, Logic: The Theory of Inquiry*. Carbondale: SIU Press.
- Franco, P. L. 2020. "Hans Reichenbach's and C.I. Lewis's Kantian Philosophies of Science." *Studies In History and Philosophy of Science Part A* 80: 62–71.
- Friedman, M. 1999. *Reconsidering Logical Positivism*. Cambridge: Cambridge University Press.
- Friedman, M. 2001. *Dynamics of Reason: The 1999 Kant Lectures at Stanford University*. Stanford: CSLI Publications.
- Hesse, M. B. 1966. Review of Arthur Pap, *an Introduction to the Philosophy of Science*. *Mind* 75: 456–7.
- Lewis, C. I. 1923/1970. "Pragmatic Conception of the A Priori." In *Collected Papers*, edited by J. D. Goheen and Jr. L. Mothershead, 231–9. Stanford: Stanford University Press.
- Lewis, C. I. 1929. *Mind and the World Order: Outline of a Theory of Knowledge*. New York: Dover Reprint.
- Pap, A. 1943a. "On the Meaning of Necessity." *Journal of Philosophy* 40 (17): 449–58.
- Pap, A. 1943b. "On the Meaning of Universality." *Journal of Philosophy* 40 (19): 505–14.
- Pap, A. 1944. "The Different Kinds of A Priori." *Philosophical Review* 53 (5): 465–84.
- Pap, A. 1946. *The A Priori in Physical Theory*. New York: King's Crown Press.
- Pap, A. 1949a. "Logic and the Synthetic A Priori," *Philosophy and Phenomenological Research* 10: 500–14.
- Pap, A. 1949b. "Are All Necessary Propositions Analytic?" *Philosophical Review* 58: 299–320.

- Pap, A. 1949c. *Elements of Analytic Philosophy*. New York: Hafner.
- Pap, A. 1950. "Logic and the Concept of Entailment," *Journal of Philosophy* 47: 378–87.
- Pap, A. 1955. *Analytische Erkenntnistheorie: Kritische Übersicht über die neueste Entwicklung in USA und England*. Wien: Springer.
- Pap, A. 1958. *Semantics and Necessary Truth: An Inquiry into the Foundations of Analytic Philosophy*. New Haven: Yale University Press.
- Pap, A. 1962. *An Introduction to the Philosophy of Science*. New York: Macmillan.
- Pap, A. 2006a. "The Limits of Logical Empiricism: Selected Papers of Arthur Pap." In *Synthese Library*, v. 334, edited by A. Keupink and S. Shieh. Dordrecht: Springer.
- Pap, P. 2006b. "Arthur Pap: Biographical Notes" in Pap, Arthur. *The Limits of Logical Empiricism: Selected Papers of Arthur Pap*, 369–74. Dordrecht: Springer.
- Parrini, P. 1998. *Knowledge and Reality: An Essay in Positive Philosophy*. Dordrecht and Boston: Kluwer Academic Publishers.
- Reichenbach, H. 1920/1965. *Relativitätstheorie und Erkenntnis a Priori*. (Berlin: J. Springer). The Theory of Relativity and A Priori Knowledge. Translated and edited by Maria Reichenbach. Berkeley: University of California Press.
- Shieh, S. 2006. "Introduction" in Pap, Arthur. *The Limits of Logical Empiricism: Selected Papers of Arthur Pap*, 3–43. Dordrecht: Springer.
- Stadler, F. 2014. "From the Vienna Circle to the Institute Vienna Circle: On the Viennese Heritage in Contemporary Philosophy of Science." In *European Philosophy of Science – Philosophy of Science in Europe and the Viennese Heritage (Vienna Circle Institute Yearbook, Volume 17)*, 9–32. New York: Springer.
- Stump, D. J. 2011. "Arthur Pap's Functional Theory of the A Priori." *HOPOS: The Journal of the International Society for the History of Philosophy of Science* 1(2): 273-90.
- Stump, D. J. 2015. *Conceptual Change and the Philosophy of Science: Alternative Interpretations of the A Priori*. New York and London: Routledge.