Introduction

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The essays composing this volume are all concerned with Edmund Husserl's last work, *The Crisis of the European Sciences and Transcendental Phenomenology*, a book that was meant to cap Husserl's long and illustrious career, and yet was never published in its entirety in his lifetime. To date, little attention has been paid to the *Crisis*, which is remarkable when one considers Husserl's reputation during the first half of the twentieth century. Under normal circumstances, its publication would have been greeted with great interest. In fact, few works in the history of philosophy have had such a dismal reception, which begins in neglect, in Nazi Germany, and turns to rejection in the 1950s and 1960s, when both continental and analytic philosophers were opposed to many of its most basic assumptions. What is the source of this aversion? And why should we devote our time to the book now? These introductory remarks provide brief answers to these questions and are followed by a discussion of the individual contributions.

The book was born in a political crisis and, as Eva-Maria Engelen explains in her contribution to this volume, at a time of personal crisis as well. Husserl was invited to give lectures in 1935 in both Vienna and Prague, titled "Philosophy in the Crisis of European Mankind" and "The Crisis of European Sciences and Psychology," respectively. These lectures were later reworked as the first two sections of the *Crisis* and were published in the journal *Philosophia* in 1936, shortly before Husserl became ill. They were supplemented by the third section when Walter Biemel finally published them in 1954 in their final, but still fragmentary, form. The original publication was almost totally ignored, although the publication

in France in 1939 of what later became Appendix VI, *The Origin of Geometry*, did provoke some discussion there.

Husserl used the occasion of the Vienna and Prague lectures to address topics that had come to preoccupy him in the increasingly hostile environment in which he found himself. His state of mind can be inferred from comments made to Gustav Albrecht in the following year, in which he makes clear that he has been driven to take a stand on his own status as a *German* philosopher. "I have finally at least to make clear for myself," writes Husserl, "that I am no stranger in German philosophy . . . , and that all of the great thinkers of the past would have had to count me as a true heir of their spirit, as blood of their blood."[1] His defense against ostracism is to insist first on the primacy of the European philosophical tradition and second on his belonging to that tradition. He responds to opponents who would banish him from Europe by championing it. Philosophical culture is European culture, and European culture corresponds quite exactly to what we refer to as *the West*. We learn that "spiritual" Europe includes some of the "colonies of England" but only those parts that are predominantly white. There are apparently no contributions to the history of science and philosophy from the Arabs, Indians, or Chinese. This is not a popular line to take today, whatever truth there might be to it.

In retrospect, we can see that this political goal was doomed from the start, and thus it is tempting to read the work today without regard to it. Since Husserl was *forced* to make a claim that we find obvious—that he was a German philosopher, heir to the tradition of German Idealism—it can scarcely be enlightening to watch him defend that truism against the absurdities of his National Socialist opponents. It is tragic, or at the very least embarrassing, to find Husserl employing the language of *Blut und Boden* when defending himself against the Nazis. And we are easily induced to adopt the same attitude toward the *arguments* he uses. He should not have to stoop so low.

It is worth emphasizing how much the origins of this text in Nazi Germany affect its content, because these aspects may elicit negative impressions today. They contributed to its peculiar status in the postwar period, when it emerged as a foil to what I call, in my contribution to this volume, the French linguistic turn. In this later context, reaction to the *Crisis* was less political and more philosophical, but it remained critical. And since developments in France were part and parcel of a large interna-

tional movement characterized by suspicion of mental or cognitive explanations, there was little interest or sympathy shown for Husserl's text in the English-speaking world of the 1950s and 1960s outside the embattled and increasingly isolated group of American phenomenologists. As phenomenology petered out in the analytic world, as behaviorism, Quine, and Wittgenstein carried the day, there was no place left for this peculiar phenomenological coda. Lastly, it did not help that, among phenomenologists, Husserl's *Crisis* came to be seen by some as a last-ditch attempt on Husserl's part to keep up with his protégé Heidegger, whose existential phenomenology was breaking new ground. With the possible exception of the school of Constructivism centered at the University of Erlangen, it is safe to say that by the 1970s, this was a book almost wholly unloved (a notable exception is Elisabeth Ströker, 1979, 1997).

But we should be reading it now. The wheel has turned, and many of the doctrines that postwar philosophers rejected, and on whose ground they rejected Husserl, have returned in force. There are systematic reasons for this. On the analytic side, the sustained arguments of Searle and others have forced the theory of intentionality back on the agenda, and there is increasing recognition that Husserl provides us with the most developed modern theory of intentionality. We now realize that the gap between continental and analytic philosophy has limited applicability before the 1940s: As David Woodruff Smith observes, Husserl and Carnap are correctly viewed as sharing problems and methods, for instance the notion of a constitution-system. Above all, the problem lying at the heart of the *Crisis*, namely the relation between the world as experienced and the world as it exists scientifically, is now the subject of lively debate. Recognition of intentionality as a legitimate subject for research has meant readmitting the referents of everyday intentions (think of qualia), that is to say readmitting something very much like Husserl's life-world. One need only consider "theory theory" and the naive science program, both of which seek to analyze the belief systems underlying speakers' everyday reasoning about the world and other people.

External factors also impinge on the philosophical debate. The progress of the sciences has accelerated; the gap we experience between the life-world and the world of science is wider. At the same time, the scientific world intrudes in the life-world ever more obviously, further weakening the latter's claim to legitimacy. Finally, even those aspects of the book that may seem politically incorrect to contemporary readers are topical and

merit serious reflection. As Michael Friedman, David Carr, and Rodolphe Gasché all point out in their contributions to this volume, Husserl does not simply champion the European tradition. He subjects it to the same critical inquiry that it has always required of itself, and he detects a paradox in the fact that this supposedly universal form of thought is nevertheless specific to a given cultural and historical setting, and that it may therefore be unjustified in its claim to universal validity.

Like the writings of the late Wittgenstein, the *Crisis* is difficult to read because it presumes working knowledge of the complex development in Husserl's philosophical thinking that preceded it. And it is not just a recapitulation; it introduces new interpretative problems of its own. Because it is in many respects the summation of Husserl's project, it will hardly come as a surprise that this is a book about everything: about the world and the self, though perhaps that is normal for theoretical philosophy, but also about a large part of the history of philosophy and science. In this regard it is nothing short of Hegelian, even if its author was suspicious of Hegel. The essays collected in this volume attempt to provide some of the context necessary for understanding this difficult work. The breadth of topics addressed in the *Crisis* is reflected in the scope of the papers, which are divided into three main areas: Husserl's theories of science and the life-world, the theory of history advanced in the *Crisis*, and the dissemination and application of Husserl's views.

Husserl's *Crisis* is not a work in the philosophy of science as we now understand the term; however, it is deeply concerned with science and its development, with its relation to everyday experience, and with its internal structure. In this sense, the *Crisis* can be correctly said to have a theory of science. In his "Science, Intentionality, and Historical Background," David Woodruff Smith extends ideas drawn from Husserl to consider how scientific theories are grounded in intentional activities occurring in concrete historical contexts, including both the natural world they represent and the human world in which they are developed. On Smith's view, the early Husserl in *Logical Investigations* took a theory to be a form of "pure logic," while in the *Crisis*, the late Husserl worried how our idealized theory of nature–mathematical physics–had become alienated from our commonsense understanding of the world.

According to Smith, a scientific theory is a structure of propositions supported by evidence. These propositions are intentional contents of sci-

entific thought or judgment, formed from concepts developed in the course of scientific research and tied through perceptual evidence to concepts developed in everyday life. Though ideal meanings, theoretical propositions are bound to historical circumstances in several ways. In his chapter, Smith appraises these types of dependence on historical context, addressing both the indexical character of scientific concepts or propositions and the historical background of theorizing they presuppose.

Smith shows how an extended Husserlian view of science elucidates (a) Husserl's seemingly divergent early and late views of theory, (b) Quine's "web" view of scientific theory (with mathematics and logic at the center of the web of belief), and (c) Michael Friedman's revisionary Kantian-Carnapian view of relativized a priori principles within a scientific theory. The basic, formal ontology of a scientific theory is, for that range of theory, a priori (Friedman), the least revisable part of the theory (Quine), and furthest from our ordinary range of *Lebenswelt* (life-world) theory (Husserl). Yet on Smith's view, a theory remains a system of ideal propositions bound by dependence to the world in which we put forth these propositions.

One benefit of Smith's analysis consists in identifying the central role of the life-world in Husserl's theory—a concept some have seen as new to the *Crisis*. In his "The *Lebenswelt* in Husserl," Dagfinn Føllesdal analyzes what he sees as the long role of this key Husserlian notion in phenomenology, with particular attention to the notions of noema, horizon, constitution, and world. On Føllesdal's view, the notion of a life-world derives from a distinction between the "natural" and "transcendental" attitudes that Husserl introduced in 1906, and which he develops under a variety of names, until it makes its first appearance in 1917. This life-world is pregiven and intersubjective, for it contains other people with their own intentional states and attitudes toward the same world we all share. Føllesdal maintains that these essential attributes of the life-world remain unchanged in the *Crisis*, and that its appearance there conforms to Husserl's past understanding. Husserl saw it as opening a new way to approach phenomenology, in that the latter can be understood in part as an attempt to characterize the formation or construction of this natural world.

Føllesdal believes we should resist the urge to see the life-world as something set up *against* science, for the scientific world is itself part of the life-world, scientific statements get their meaning from being embedded

in the life-world, and thus they are also ultimately *justified* by the life-world. He concludes by considering this last key function of the concept, which appears to hold for Husserl even in the case of mathematics. How can the life-world be the source of ultimate justification if it is also the realm of *doxa*, of mere opinion and prejudice? Føllesdal's reply is that for Husserl, there is no dishonor in so justifying our beliefs, because there is no alternative. Even the scientist must revert in ultimate justification to the everyday world and life he lives.

This interpretation finds agreement in Ulrich Majer's discussion of the views of Hermann Weyl, who claims that the scientist or mathematician always has recourse to primitive life-world capacities. Majer's "The Origin and Significance of Husserl's Notion of the *Lebenswelt*" approaches the life-world from the point of view of contemporaneous philosophy of science, above all the philosophical writings of Weyl and David Hilbert, two prominent Göttingen mathematicians and physicists indirectly connected with Husserl. He argues that Husserl's concept is an important *discovery*—both philosophically as well as from a scientific point of view. For Majer, it would be a mistake to read the *Crisis* as a work on the history of philosophy, enriched with some history of science; rather, we are dealing with philosophy dressed up as history. He identifies the key philosophical problem as akin to what Husserl's contemporary Weyl had described as a "ridiculous circle." To illustrate the circle, Weyl imagines a reductive sequence in which we analyze "the chalk on the blackboard" as an amalgam of elementary particles, and these in turn are "dissolved" into a rule-governed calculus, which is in turn revealed to be nothing other than "concrete signs written with chalk on the blackboard." Weyl contends that this shows us that there is an *irreducible* basis to our experience, which he refers to as "the manner in which we understand man and things in daily life" (Weyl, 1968, 342).

It is in fact one of the central themes of the *Crisis* that we cannot understand science with the methods of science on pain of circularity. But there is a deeper connection to be seen, Majer suggests, when one recalls that Weyl is thinking here in part of the foundations of mathematics, in particular Hilbert's formalism. In such a pure formalism, Weyl argues, we can dispense with almost all familiar (including logical) concepts, but we still presume basic capacities to operate with symbols. It would be wrong, he asserts, "to reduce this naively and roughly understood spatial order of signs to a *purified* spatial intuition and structure as it is expressed

for example in Euclidean geometry." This capacity is a "natural understanding in dealing with things in our natural world surrounding us" (1968, 341). To hope to replace our natural understanding of signs with a theoretical account would be, Majer suggests, a category mistake akin to the confusion of symbol and sign, which distinction is itself a reflection of the distinction between mind and body.

This close agreement between Husserl's and Weyl's views raises the question of whether anyone has actually ever fallen into Weyl's ridiculous circle. Many scientists, Majer points out, are sensitive to these issues. But there are also scientists who believe that all traces of the mental can be banished from our scientific ontology, a position that is of course familiar to many philosophers as strong reductionism or physicalism. To champion this strong view, Majer selects David Hilbert, the scientist who maintained that all problems that can be clearly stated can be solved. If Hilbert is aware of the circle, that would be good reason to believe that most scientists are. And here we may be reassured, for Hilbert himself acknowledges that there is something paradoxical to the idea of a complete scientific theory, one that explains everything, for such a theory would transform our thought itself into something "merely apparent."

The foundations of mathematics are also the main concern of Ian Hacking's "Husserl on the Origins of Geometry," which focuses on *The Origin of Geometry*, an appendix to the *Crisis* that has received almost as much attention as the work itself. While Hacking is sympathetic to Husserl, he is above all critical of the latter's notion of sedimentation, which on Hacking's view is far less common in mathematics than Husserl seems to think.[2] According to Hacking, Husserl is one of those philosophers who is awed by mathematics, particularly by mathematical proof, which is not surprising when one recalls that his doctorate was in mathematics, not philosophy. This awe is bound up with Husserl's historico-foundational project, however; that is to say with the search for what Hacking calls the *Ur* words: the *Ursprung* (primal origins) of geometry, its *Urstiftung* (primal establishment). The search for origins betrays a tendency found also in Freud, ultimately due to Hegel, namely to think that by finding the origin of some event or process (pathology, proof), we will somehow grasp or undo the problems it presents to us. This is a project that Hacking himself cannot share, because, in his view, the ability to make proofs is an innate human capacity, which makes a search for the unique historical origin of mathematical proof otiose.

Hacking develops these ideas by contrasting Husserl's views on the origins of geometry with Kant's, drawing on the well-known passage from the preface to the first *Critique*, in which Kant imagines the first geometer. Unlike Kant's lone geometer, Husserl's form a community; and whereas Kant focuses on the notion of conceptual construction (mathematical proof), Husserl directs his attention to the formation of ideal objects. His primitive geometers construct an ideal ontology through their communal linguistic activity. Lastly, whereas Kant's scientific hero is Newton, Husserl focuses on Galileo, or more precisely on *his* Galileo, what he sometimes calls the "Galilean style." Hacking disagrees with Husserl, however, who he thinks unjustly saddles Galileo with an old ontology of ideal geometrical objects, while what Galileo mathematized were not *things* but *motions*.

Hacking concludes by considering Husserl's "historical a priori" as well as the process of sedimentation. With regard to the former, he takes a "French" line, seeing in Husserl the source of Foucault's homonymous concept, namely historical structures of thought or speech that determine "conditions of possibility and exclusion that come into being" in a given historical frame.[3] This notion is clearly related to that of sedimentation, in that we call such a priori structures historical precisely because they are now concealed from us. To reactivate them is to unearth sedimented norms. It is on just this point that Hacking deviates most strongly from Husserl's views, for he simply does not accept that mathematical knowledge has the sedimentary structure that Husserl supposes. Considering a number of contemporary examples, he argues that modern mathematicians often have "the living experience of the very evidence, the primal evidence, that Husserl sought." This is because Kant had it better than Husserl: Geometric and algorithmic reasoning are indeed a cultural phenomenon, according to Hacking, but this is because they rest on innate human capacities, which may express themselves whenever the circumstances are favorable, and which therefore do not have, as Husserl believed, an inaugural moment.

The next group of essays concern the second major theme I mentioned in introduction, namely the theory of history implicit in the *Crisis*. How is Husserl's preoccupation with history to be understood? Does it constitute a philosophy of history, and if so, in what sense? How does it compare with other approaches to history? In his contribution, David Carr

develops answers to these questions by drawing on the customary distinction between substantive or speculative philosophy of history, on the one hand, and critical or analytical philosophy of history on the other. Although he allows that there are elements of each in the *Crisis*, he concludes that its most important contribution to the philosophy of history lies in the concept of *Geschichtlichkeit,* or historicity.

On the surface, Husserl's historical method is reminiscent of Hegel's, in that he offers a teleological history of Europe that is simultaneously a history of reason. But it would be a mistake, argues Carr, to read him in this way. The mere appearance of the term *crisis* ought be sufficient to warn us: Husserl views such a Hegelian project "as an object of bittersweet nostalgia and with a sense of loss," for the sciences are in crisis—they are no longer a source of hope and salvation for humankind in the way that Hegel envisaged. Nor will it do to read Husserl as substantive history in the mold of Kant, for here again there is no crisis that demands urgent intervention, whereas when we look to the philosophical literature in the decades preceding the *Crisis*, we find a number of similarly titled works with similar preoccupations. Carr concludes that Husserl's view of history is typical for the early twentieth century, even while the specific form of Husserl's crisis is intimately connected to his personal situation as a Jew (though a longtime convert) in Nazi Germany and to the situation of German philosophy as a whole at this time.

Carr next considers the analytical and epistemological aspects of Husserl's theory: Can it also be regarded as a contribution to the critical philosophy of history? The key distinction here is between the *Natur-* and *Geisteswissenschaften* (natural and human sciences) endorsed by German philosophers and historians in opposition to the historical positivism of Comte or Mill, which would assimilate history to natural science. Husserl sided with his countrymen on this issue, as reflected, for example, in his parallel distinction between the "naturalistic attitude" and the "personalistic attitude." But most of Husserl's subtle treatment of these issues is missing from the *Crisis*, according to Carr, and its contribution to the epistemology of the (human) sciences remains limited.

Husserl's real contribution to the philosophy of history is instead to be found in his notion of *Geschichtlichkeit,* or historicity, a term also prominent in Heidegger, and which may have been derived from Dilthey, according to whom we "are historical beings before we become observers of history" (1968, 277–78). For Husserl, this came to mean that the ego, as a

self-constituting synthesis of temporal relations, constructs a narrative history of its own life; that is to say, it is an aspect of consciousness that it have historicity. But we do not obtain historicity proper until we have intersubjectivity, at which point the background of the individual's past becomes a social past, so that consciousness now includes history as an integral part.

Although historicity is not an epistemological concept, it does have an epistemological aspect, because it explains at the very least our *interest* in the past. Carr suggests that we can grasp the epistemological import of Husserl's notion if we compare it with what he says about the life-world. Just as the latter is the background without which there would be no natural science—a background both independent of and prior to the sciences—so the essential historicity of consciousness provides the background without which there would be no historical questions in the first place, whatever the specific epistemological problems these may raise.

Carr argues, however, that the epistemological implications of the concept go further. For involvement in any science entails an awareness of its historical and communal past, which is most immediately exemplified by Husserl's own awareness of the past history of philosophy, in which he as a philosopher will *intervene*, as opposed to merely describing or analyzing. This is, Carr suggests, a late realization on Husserl's part, for he had earlier insisted, for instance in *Ideas I*, that in doing phenomenology "we completely abstain from judgment respecting the doctrinal content of all pre-existing philosophy, and conduct all our investigations under this abstention" (§ 32). In his late work, Husserl comes to acknowledge that historical prejudices are not *mere* prejudices, that is to say that they too require the phenomenologist's attention. This fact leads to one of the central paradoxes of the *Crisis*, which concerns philosophy's history as a European tradition. For this tradition, as Husserl points out repeatedly, is a tradition that understands itself as free of any prejudices, thus presumably also those that derive from *its* specific historical situation. According to Carr, Husserl can no longer affirm the absolutely universal character of philosophy, but he is similarly aware that in conceiving of philosophy as a European tradition, he opens it to the charge of cultural relativism.

This deliberate tension, which remains unresolved in the *Crisis*, is a central topic of Michael Friedman's "Science, History, and Transcendental Subjectivity in Husserl's *Crisis*." Friedman traces out the long-standing

connection between Galilean mathematical science and the phenomenological philosophy that begins with Husserl's 1910 "Philosophy as Rigorous Science" and extends to the *Crisis*. In that early text, Husserl took Galileo's work as a model for phenomenology: Just as mathematical physics requires an a priori mathematical structure in order to qualify as a rigorous science, so too philosophy must have an a priori part if it is to avoid the trap of naturalist psychology, and this a priori core is what will be provided by phenomenology. But this analogy between the two disciplines later becomes a problem, for by then the scientific ideal embodied in the Galilean style has caused a crisis at the heart of the sciences. The crisis results from our (that is, for Husserl, European humanity's) mistaking the ideal ontology of mathematical physics, which depends ultimately on life-world experiences, for the totality of objective reality. This mistake is only possible because of the sedimentation of geometric knowledge, that is to say the mechanical repetition of this knowledge without regard to its eidetic origins. Its most immediate consequence is Cartesian mind-body dualism, which cleaves the world into physical and objective matter and psychic and subjective mind.

The Cartesian split leaves the mind as a realm of appearances, and this conclusion can only be fought by adopting a position much like that advocated by Husserl in "Philosophy as Rigorous Science," namely one must recognize the transcendental character of mind, the fact that it has an a priori structure. But Husserl rejects Kant's attempts in this direction because they do not recognize the essentially perceptual or intuitive nature of mind: Kant's transcendental logic is arrived at not by considering the structure of experienced consciousness (even if Kant claims that he does), but by analyzing the sciences of logic and nature themselves and positing their rudiments as basic structures of cognition. Put simply, Kant ignores the life-world in his rush to ground Aristotelian logic and Newtonian physics.

From here, Friedman turns to an extended analysis of Husserl's notion of the life-world. He considers in particular the distinction between objective sciences following the Galilean style and the science of the life-world, which prescinds from all the special kinds of intuition appropriate to each of these sciences, dealing instead with the foundational structure that is the precondition of all of these—a process Husserl terms "the epoché of objective science." This *epoché*, or bracketing, is to be contrasted with the "Cartesian" method of the *Ideas*, in which we prescind from the

entire "external" world, including the life-world itself. But it is not yet the full transcendental epoché Husserl develops in the *Crisis*, which requires changing our orientation within the life-world to reveal its transcendental structure, namely its intentional constitution.

It is here that Husserl's views are most clearly distinguished from Descartes' and Kant's. According to Friedman, Husserl is at pains in the *Crisis* to correct a common misapprehension of his project, namely that it is foundational. As Husserl himself points out, the aim of transcendental phenomenology "is not to secure objectivity but to understand it" (*Crisis*, § 55). This is not Descartes' foundationalist project; it is a transcendental one, which seeks to *ascertain* the conditions of experience. But it is not Kant's project either, because Husserl will not stop at what he calls "the phenomenological-psychological reduction," which is centered on the individual ego. The final transcendental reduction must acknowledge that "self-consciousness and consciousness of others are inseparable" (*Crisis*, § 71), by revealing that I am structured not as an individual consciousness, I am "within an inter-human present and within an open horizon of humankind: I know myself to be factually within a generative framework, in the unitary flow of an historical development" (ibid.).

Like Carr, Friedman argues that in arriving at this terminal position, Husserl also broke for good with the conception of transcendental phenomenology he had articulated on the Galilean model in "Philosophy as Rigorous Science." He does so because on that earlier view, the relation of phenomenology to psychology was analogous to that of mathematics to physics: Phenomenology would articulate the normative structure of psychology. But the new view includes intersubjectivity and historicity as essential elements of consciousness, and it is no longer concerned with the normative structure of an individual ego's thought alone. Instead, the role of transcendental phenomenology is now to intervene in the present crisis and recapture the original idea of science as a philosophical form of human existence.

This same paradox concerning philosophical and scientific universality is the central topic of Rodolphe Gasché's "Universality and Spatial Form." Gasché argues that Husserl's *Crisis* can be correctly understood as a critique of universality, more particularly of the failure of modern science to deliver on the promise of universal knowledge that was made in ancient Greece. This failure is also a failure of the European ideal, since

Europe, for Husserl, is inextricably linked to Western science. Universal science in the Greek sense is not only the science of the one true (as opposed to apparent) world, it is also a science freed from any particular attachments, whether these be to a given subject matter or to a given knower or community of knowers. But this attitude is effectively lost in the Renaissance, in that the *critical* aspect of this project—calling all particular attachments and traditions into doubt—is offset by an uncritical acceptance of its scientific fruits. Instead of being a truly universal form of knowledge, European science becomes anchored in the specifics of European culture so that the eventual "Europeanization of all other civilizations" becomes a "a historical non-sense" (*Crisis*, § 6). According to Gasché, what is exported as techno-science is a kind of universality that is (paradoxically) *specific* to European culture, thus one whose world is not truly shared by all.

The quintessential product of Greek universal science is geometry, the science of the ideal forms of space, which by determining the spatial forms of all possible (relative) worlds also determines the form of the one we all share. In the Renaissance, this universal aspect of geometry is used as a basis on which new universal sciences are constructed, thus paving the way for the mathematization of nature, a development that Husserl characterizes as "strange," because Greek geometric objects were *nonsensible idealities* (that was the source of their very universality) developed by abstracting from sensible, life-world experience. And yet for Galileo, this connection to the life-world is ignored in favor of geometry's universal, intersubjective aspects, resulting in "a tradition empty of meaning" (*Origin of Geometry*, p. 366). Gasché goes on to demonstrate that, for Husserl's Galileo, the privileged role of geometry derives from positing the one property all bodies have in common—shape—as fundamental, so that the remaining material properties of our experience (the so-called plena) *must be reducible in principle* to this one universal property. This results in the idealization of the whole of our experience, a goal Husserl calls "the Galilean idea," and thus in the loss of those very material properties that originally provided the basis for the universal idealities (*Crisis*, § 9e). According to this idea, the world is in principle completely mathematizable, and yet it remains a "strange" hypothesis, which is subject, in the course of natural science, to an endless process of verification. Modern scientific thought, instead of seeing this unending project as a means of framing the world, objectifies it—it takes "for *true being* what is actually

a *method*" (*Crisis*, § 9h). This is, according to Gasché, "an ethico-philosophical error" that Husserl believes can only be corrected by recognizing the concealed project of universalization and idealization that began in ancient Greece, thereby acknowledging the essential historicity of geometric and natural scientific knowledge. For Husserl, that means acknowledging that they are the product of a constituting consciousness, whose study is precisely an object of phenomenological philosophy.

Eva-Maria Engelen investigates this same basic motif of the *Crisis*—the search for "original" experience or meaning, here exemplified in Greek scientific origins —in her "Husserl, History, and Consciousness." She considers three philosophically important origins of meaning in Husserl's text, and a fourth, personal one: consciousness, the life-world, European philosophy and science, and Husserl's personal origins as a Jewish and German thinker. The last two are evidently interconnected, since in writing the *Crisis*, Husserl is simultaneously establishing his identity as a *German* philosopher—against those who would deny him—by showing that he is an inheritor of the European philosophical tradition. In order to be such a descendant, he must himself engage in critical reflection on that tradition itself, since it has always been a tradition of critical inquiry. Engelen compares Husserl on this point to Michel Foucault, who argues that Kant was the first to pose the question concerning rationality as a *historical* question, that is, as one concerning the social and historical conditions of its development, as opposed to its origins in consciousness, considered atemporally. Husserl deliberately runs these two together: His search for the origins of European rationality is rooted both in present consciousness and past history. Engelen suggests that this historical/ahistorical duality is typical of all four of the origins of meaning that she considers. She concludes by considering the ways in which the concept of consciousness itself has a historical dimension, in that it did not and perhaps could not have existed for Greek thought. This raises the question of whether the Greeks could have experienced a life-world, or whether the latter is actually a post-Cartesian concept that has been illegitimately projected by Husserl into prehistory.

The duality between historical and ahistorical origins forms the basis of Michael Hampe's "Science, Philosophy, and the History of Knowledge" as well. Hampe considers Husserl's *Crisis*, and in particular the concept of a life-world, from the point of view of Wilfrid Sellars's later notions of the "manifest" and "scientific images." According to Hampe,

both Husserl and Sellars were among the first to see something that has only recently begun to preoccupy philosophers generally, namely that a complete account of knowledge must make room for both objective and subjective knowledge and experience, as well as resolving the deep tension that always exists between the two. Both philosophers saw the resolution of this tension as lying unavoidably in philosophy, which thereby acquires a singular importance for human self-knowledge.

Hampe observes that both Sellars and Husserl follow in a line of philosophical argument that emerged in German idealism, in which the origins of human knowledge are described in terms that are superficially historical, but are in fact intended to be rational-dialectical. Like Fichte, Schelling, and Hegel, our two philosophers tell origin stories (the origin of man's concept of himself, the origin of geometry) that are clearly not intended to be actual history, but that instead explain the ideal essence of some unknown, and in their details, unimportant historical events. The fictitious *historical priority* of the life-world or the manifest image explains and justifies their *epistemological priority*, namely the claim that the scientific view is itself a product or development of them. This epistemological priority also shows itself in the present, in that the manifest properties of the life-world (for example, colors) persist as immediate data for the subject even once their natural scientific explanation has been given.

According to Hampe, both Husserl and Sellars suppose that in articulating the concealed elements of our knowledge—that is, the life-world background of the modern scientific view—we will achieve unification through transparency: By revealing hidden or "sedimented" knowledge-structures, we will supply the elements whose absence hinders unification. But in setting up the unity of knowledge as the goal to be achieved, they fail to recognize that much (scientific) knowledge is tacit and may therefore be in principle beyond "reactivation." Finally, it is just this project of unifying by revealing concealed knowledge-structures that necessitates the peculiar view of history just outlined: Each philosopher sees it as a development toward unification, as a process with a "hidden aim." Hampe has doubts similar to Engelen's about the assumptions bound up with Husserl's own conceptual tools. This whole approach would only make sense, Hampe argues, if historical investigation itself were completely transparent and did not rely on implicit knowledge of its own—and yet this is almost certainly not the case. Indeed, this assumption is

reflective of a general tendency to underestimate the complexity and resilience of nonscientific knowledge and institutions, a tendency that might, on Hampe's view, "foster a kind of anthropological essentialism"—one that might, however, resemble that advocated by Hacking in his contribution when discussing mathematical proof.

The last three essays of this collection concern the application and dissemination of the late Husserl's theory of science. David Hyder discusses the relations between Husserl and later French authors such as Cavaillès and Foucault, who transform Husserl's transcendental project into a form of linguistic analysis. Friedrich Steinle shows how Husserl's ideas may be fruitfully extended and applied in historical research in the experimental sciences, in this case, chemistry. And in his "On the Historicity of Scientific Knowledge," Hans-Jörg Rheinberger considers Husserl's work as an instance of wider developments in the first decades of the twentieth century, in particular what has been called a "crisis of reality" or a "crisis of historicism." This double crisis, which Rheinberger argues is found in the work of Gaston Bachelard and Ludwik Fleck as well, led to a transformation in the history of science, whereby it became a properly epistemological enterprise and no longer merely the chronicler of positive scientific developments.

According to Rheinberger, late nineteenth-century thinkers, for example, Emil Du Bois-Reymond or Ludwig Boltzmann, held to a curious fusion of mechanism and historicism, in which historical explanation in the life sciences meshed with a naturalization of history, the link being Darwin's theory of evolution. But this view was only of brief duration, for two developments within the sciences themselves led to a new perspective on history, one exemplified in Husserl's and Fleck's writings. These developments were the rapid changes within contemporary physics and the same problem of the unity of the sciences just mentioned in our discussion of Hampe. The first of these led to an increasing awareness of the open-ended nature of scientific investigation, the fact that every theory is provisional. The second was given its bite both by the peculiar status of biological explanation, which employed concepts apparently distinct from physics, and by the internal differentiation within biology, both of which suggested that biology was not to be united with the rest of science easily, even if the Vienna Circle had made unification their watchword.

This is the context in which Ludwik Fleck, whose work is also discussed by Steinle, argued for an epistemology of the sciences that is both social and historical. Fleck's contemporary Bachelard drew similar lessons from developments in quantum theory: We should conceive of science as the activity of a community of human subjects who interact with the world in an ongoing process of investigation, as opposed to one in which they reflectively contemplate it. At that point, the sciences themselves become an object that can be investigated with historical methods. Rheinberger argues that we can understand Husserl's *Crisis* as motivated by shared questions concerning the (new) nature of the natural sciences, particularly the problem of accounting for human subjectivity in the terms of the natural sciences. We have seen this problem before: Natural science itself is a product of human activity, so this means explaining science by means of science, the very circularity Hermann Weyl called "ridiculous."

The absurdity of such circularity leads Husserl to ask for a "critique and clarification" of "that huge piece of method . . . that leads from the intuitively given surrounding world to the idealization of mathematics and to the interpretation of these idealizations as objective being" (*The Vienna Lecture*, p. 295). According to Rheinberger, Husserl understands himself to be supplying the necessary critique and clarification by means of his historico-epistemological investigation. But he could not free himself from foundational presuppositions, so that his historical investigations presuppose a teleological order to history and terminate in a foundational life-world. It is only in more recent work on the historical epistemology of the sciences that these foundational presuppositions are finally abandoned.

David Hyder's "Foucault, Cavaillès, and Husserl on the Historical Epistemology of the Sciences" deals with the impact of Husserl's *Crisis* on subsequent French philosophy of science, in particular the work of Jean Cavaillès and Michel Foucault. It is in France that the *Crisis*, and perhaps even more so, *The Origin of Geometry* had their greatest influence, in part due to the publication in 1939 of the latter text, with a series of commentaries, in a widely read special issue of the *Revue internationale de philosophie*. The substantial effect of this publication on the work of Jacques Derrida is well known;[4] however, its influence on the school of history and philosophy of science grouped around Gaston Bachelard is less well documented. Hyder shows that Jean Cavaillès drew heavily on

Husserl's account of scientific development in his *Sur la logique et la théorie des sciences*, a book that deeply affected Georges Canguilhem and his student, Michel Foucault. He argues that, in the hands of these French critics, the overall form of Husserl's account of sedimentation is preserved, but a fundamental thesis shared with Kant—that the history of science is in some sense a history of consciousness—is explicitly denied. The result is that while the sedimentation of scientific ontologies and their historical a prioris is an essential part of these French critics' approach, Foucault in particular insists that the structures in question are linguistic, as opposed to mental. He refers to the process of unearthing these hidden normative structures as "archaeology." Hyder argues that even the latter notion can be traced back to Eugen Fink's commentary on *The Origin of Geometry* in that same 1939 publication. The result is a Husserlian philosophy of science that has taken a linguistic turn remarkably similar to that which took place simultaneously in the English-speaking world.

Thus Husserl's thinking has affected the history of science quite significantly, aside from possible influences of his thought on analytic notions such as that of a constitution-system. Friedrich Steinle's contribution gives us a practical application of his ideas to a case of sedimentation in the experimental sciences, one that apparently runs against Husserl's assumption that it occurs only in the deductive-mathematical ones. For Steinle, there is more sedimentation in experimental science than Husserl envisaged—the converse of Ian Hacking's criticism, according to which there is less sedimentation in mathematics than he supposed. His case study concerns Charles Dufay's discovery of the bipolar nature of electricity.

According to Steinle, Dufay's research was directed more toward articulating *concepts* than it was toward *theories*. Dufay did not offer any explanatory theory to go along with his conceptual articulation; thus we are not dealing in his case with an episode in the deductive sciences. But Husserl's concept of sedimentation, while it was developed with an eye on the axiomatic, a priori sciences, is nevertheless just as applicable in cases such as Dufay's. For in the laboratory sciences, knowledge can sediment as materials and methods. In particular, the long sequence of conceptual articulation required by Dufay to attain his new concept of electricity eventually sedimented for his successors because they were able to purchase devices and textbooks that rendered the two electricities

immediately accessible to them. Their unreflective use of these concepts and equipment both contained and concealed the results of Dufay's painstaking laboratory work.

Steinle agrees with Hans-Jörg Rheinberger in seeing parallels between Husserl's notion of sedimentation and Fleck's account of the origination (*Entstehung*) of scientific facts, according to which these bear traces of the now-hidden experimental and theoretical activity that generated them. The existence of such processes suggests to Steinle that science may not have the sedimentary structure Husserl ascribed to it. Instead of a successive layering of axiomatic systems, Steinle sees a haphazard structure reminiscent of a coral reef, whose living and sedimented parts are in flux, and which can only be understood by investigating its organic history.

The breadth of these essays is reflective of the scope of Husserl's *Crisis*, which may strike us as absurdly ambitious by present standards. Few philosophers today feel able, and more importantly, they do not feel compelled, to do philosophy on the scale that Husserl does in this book. There can be no doubt that this is one of the last works of philosophy that is free of the nagging self-doubt typical of much philosophy in the latter half of the twentieth century. The collapse of both structuralism and the project of unified science left both continental and analytic philosophy in similarly fragmented states. Perhaps, as Michael Hampe argues, Sellars was an exception to the rule, but it is fair to say that philosophy after the 1950s is chastened and modest in its ambitions, having largely retreated to the analysis of language. Husserl's book, on the other hand, seems like a remnant of classical German Idealism stranded in the twentieth century. It knows no restraint; and if it is despairing, it is emphatically not jaded.

But the *Crisis* still makes for instructive reading, perhaps for this very reason. Is not the process of dissolution and self-doubt that infects postwar philosophy something the *Crisis predicted*? Is it not a symptom of the crisis itself? Postmodernism began by explicitly *rejecting* Husserl's solutions, but that meant first accepting in large measure the diagnosis he had offered, in particular the account of sedimentation and axiomatic (written) systems. Similarly, analytic philosophy has conducted a long campaign to reduce the mental to the physical but has only recently come to acknowledge the tenacity of intentional and semantic concepts. The philosophy of mind operates in the very gap between life-world and

science that Husserl so precisely surveyed. It lives, one might say, in a permanent crisis.

This is not to say that a modern-day reader will have an easy time extracting contemporary lessons from the *Crisis*. As with most late works, we are in the presence of a master, but one who is increasingly alone, who feels ever less of a need to explain or justify himself. That makes comprehension arduous. But the effort is well rewarded. Anyone who takes the time to work through his arguments stands to gain much from these night thoughts of Husserl.