

THE CULTURE OF VIENNESE SCIENCE AND THE RIDDLE OF AUSTRIAN LIBERALISM*

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Vienna's scientific culture has long attracted historians' attention. Impressive though the scientific accomplishments of Viennese scientists were, and recognized by numerous Nobel prizes, they alone do not account for the historians' interest. Rather, Vienna's culture of science was imbedded in broader humanistic visions and invested in political and educational projects of major historical significance. Viennese philosophy placed humanity's hopes in science and articulated its historical ramifications to the public, drawing out the political implications of competing scientific methodologies and tying them to dramatic historical events. This philosophy of science still reverberates nowadays in debates on liberty, markets, and government that quickly reveal their underpinning in the methodology of science. Vienna's scientific culture, it seems, has never ceased to capture the imagination, far beyond Austria.

For the post-World War II Western public, Viennese philosophy of science has become associated with liberalism. It actually had different political vintages—socialist, liberal, and even fascist—but only the liberal variant proved adaptable to Western democracies. Philosopher Karl Popper (1902–94) and economist Friedrich Hayek (1899–1992) represented two prominent liberal alternatives, the first oriented toward social democracy and rooted in the philosophy of natural science, the second libertarian, or conservative, originating in the methodology

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of social science. Both based their liberal pleas on the uncertainty and limits of our knowledge of the natural and social world—the conjectural character of science and the unintended consequences of social action.¹ It may seem paradoxical that Austria, which encountered great difficulties in developing a liberal political culture and suffered no shortage of political campaigns for absolute truth, gave rise to Western liberal philosophies emphasizing limits, propounding caution, and foregrounding critical debate. Yet Viennese philosophy responded repeatedly to the political crises of the Empire and the First Republic by imagining utopian alternatives. Popper’s response to the collapse of interwar Austrian democracy was to imagine the scientific community as an ideal public sphere, and turn science into a model for democratic politics—the “open society.”

Deborah Coen’s *Vienna in the Age of Uncertainty: Science, Liberalism, and Private Life* is the most recent contribution to the scholarship on Viennese liberalism and its scientific culture.² Coen gracefully portrays three generations of a scientific dynasty, the Exner family, from the 1840s to World War II. The Exners included imperial Austria’s foremost educational reformer, Franz Exner (1802–53); two *fin de siècle* rectors of the University of Vienna, jurist Adolph and physicist Franz Serafin Exner; numerous accomplished scientists, scholars, and artists, both men and women; and a Nobel Prize-winner in physiology (Karl von Frisch, 1886–1982). As the main context for the Exners’ scientific work, Coen highlights the family’s summer retreat in the Austrian Alps, Brunnwinkl. She raises major questions about the making of Austrian science and Viennese liberalism, suggests innovative ways of rethinking their relationship, and intervenes in the historiography on Viennese modernism.

This essay responds to Coen’s invitation to rethink the relationship between Austrian science and liberalism. I shall address her proposals, offer alternative ways of thinking about the private and the public, the uncertain and the rational in Viennese science, and configure her place in the historiography. In the process, I hope to probe also the riddle of Austrian liberalism—its rapid devolution into German ethnonationalism. Coen sees her major tasks as relocating the production of liberal science and politics from the public sphere to the patrician family, highlighting the liberals’ deft management of an uncertain physical and political universe, and positing the expanded liberal family circle as an ideal intellectual community. Her accomplishment, however, goes beyond her goals, and is, at points, at variance with them. Imagining the Exner family in Brunnwinkl

¹ Friedrich von Hayek, *The Counter-Revolution of Science: Studies on the Abuse of Reason* (Glencoe, IL: Free Press, 1952); Karl Popper, *The Open Society and Its Enemies*, 2 vols. (London: Routledge, 1945).

² Deborah Coen, *Vienna in the Age of Uncertainty: Science, Liberalism, and Private Life* (Chicago: University of Chicago Press, 2007). Page references are subsequently given in parentheses in the text.

as an ideal scientific community, Coen has refashioned a liberal utopia and rehabilitated Austrian liberalism.

POLITICAL CRISIS AND LIBERAL SCIENCE: COEN AND SCHORSKE

Fin de siècle Vienna is a *locus classicus* for the convergence of political crisis and scientific and artistic innovation. Carl Schorske created the paradigm explaining the rise of psychoanalysis and of Viennese modernism in architecture, literature, and the arts as both signaling and responding to the dissolution of Austrian liberalism. Coen's Exners provide an indomitable example of a patrician Viennese liberal family. They seem as if created for Schorske's portrayal of liberalism. But Coen sees it differently and couches her book as a critique of Schorske. Arbitrating her criticism should provide insight into Viennese liberalism and science and their relationship.

Schorske's essays on Vienna appeared over the 1960s and early 1970s in the leading historical journals, then, together with new essays, were published in 1980 in *Fin-de-Siècle Vienna: Politics and Culture*.³ The book so indelibly shaped our picture of the era that the very mention of *fin de siècle* Vienna recalls for many people the book. Schorske painted a daunting picture of the collapse of the harmonious liberal world of the Viennese patricians, of *Besitz* (property), *Recht* (law), and *Kultur* (culture) crumbling under the pressure of populist nationalism and anti-Semitism, of liberal *Wissenschaft* succumbing under the modernist siege. Modernism signaled the dissolution of bourgeois orderliness and progress. *Bildung* ideals foundered; the well-formed character, the psychologically balanced and ethically responsible individual, vanished. In stepped visions of a chaotic universe, social decadence, instinctual life, psychological torment, and morbidity. Schorske articulated the dismay and shock of the liberal patricians, who had presumed to master the world—*Wissen macht frei* ("knowledge liberates")—only to discover that neither their politics nor their science could fathom, let alone resist, the new illiberal politics and modernism.

The rise of the Christian Socials and Pan-Germans in the 1880s created "politics in a new key"—populist, anti-Semitic, proto-fascist. The new politics elevated charismatic leadership, transcended class, eschewed deliberation, and drew on emotion, aesthetic sensibility, and collective identity. By 1897 the Christian Socials' leader, Karl Lueger, became mayor of Vienna, formerly a liberal bastion. Theodor Herzl's Zionism, a utopian nationalist response to the failure of liberal emancipation, reflected the new style too. Against this political background, Schorske displayed the creativity of Viennese modernism, finding the modernists alternating between desperate efforts to domesticate illiberalism and ambivalent

³ Carl Schorske, *Fin-de-Siècle Vienna: Politics and Culture* (New York: A. Knopf, 1980).

appropriations refashioning it. If Arthur Schnitzler appeared as the cool analyst of a dying liberal culture, Hugo von Hofmannsthal gave poetic expression to the new political psyche. Gustav Klimt's expressionist paintings evoked a scandal that pitted the liberals against the modernists. Psychoanalysis signified a withdrawal from the public to the private sphere, from politics to a new science—a frantic endeavor to master scientifically conflicts that liberal politics had failed to manage. Schorske let literature, architecture, painting and music each retain its internal logic of development, but showed this logic responding to the political crisis of liberalism. Three decades after its publication, and almost half-a-century after its first essays had seen the light, *Fin-de-Siècle Vienna* continues to inspire historians young and old.

Fin-de-Siècle Vienna also remains the subject of a lively historiographical debate, as historians have refashioned Schorske's "liberal crisis" in important ways. Steven Beller drew attention to the Jewish profile of *fin de siècle* liberalism, and sought the roots of Viennese cultural efflorescence in Jewish aspirations rather than in the liberal predicament.⁴ Karlheinz Rossbacher exposed the dark side of liberalism—the depression, suicide, misogyny and anti-Semitism among leading intellectuals and Jewish families' assimilation dilemmas.⁵ James Schedel showed the imperial bureaucracy adopting the liberals' program and suggested that, notwithstanding their electoral defeats, they continued to have a hold on power.⁶ John Boyer argued for the conventional middle-class character of the liberals' foremost opponents, the Christian Socials, and found the liberals' Achilles heel in their staunch resistance to democratic suffrage and aggressive anticlericalism.⁷ Pieter Judson highlighted the liberals' fervent German nationalism (and their continued strength outside Vienna) and outlined a liberal devolution into ethnonationalism, grounded in liberal exclusivity and hierarchies.⁸ Lothar Höbelt's overview of the liberal German camp, seamlessly weaving liberalism and nationalism, suggested the vitality

⁴ Steven Beller, *Vienna and the Jews, 1867–1938: A Cultural History* (Cambridge: Cambridge University Press, 1989).

⁵ Karlheinz Rossbacher, *Literatur und Liberalismus: Zur Kultur der Ringstraßenzeit in Wien* (Vienna: Jugend und Volk, 1992); *idem*, *Literatur und Bürgertum: Fünf Wiener jüdische Familien von der liberalen Ära zum Fin de Siècle* (Vienna: Böhlau, 2003).

⁶ James Schedel, *Art and Society: The New Art Movement in Vienna, 1897–1914* (Palo Alto, CA: Society for the Promotion of Science and Scholarship, 1981).

⁷ John Boyer, *Political Radicalism in Late Imperial Vienna: Origins of the Christian Social Movement, 1848–1897* (Chicago: Chicago University Press, 1981); *idem*, *Culture and Political Crisis in Vienna: Christian Socialism in Power, 1897–1918* (Chicago: Chicago University Press, 1995).

⁸ Pieter Judson, *Exclusive Revolutionaries: Liberal Politics, Social Experience, and National Identity in the Austrian Empire, 1848–1914* (Ann Arbor, MI: University of Michigan Press, 1996).

of a tradition most of us dread, rather than the crisis of a liberalism we can love.⁹ Our picture of Austrian liberalism has become multifaceted and multivalent.

Our view of the relationship between liberalism and Viennese modernism has likewise become more complex. Allan Janik, whose early work had explained, in terms similar to those of Schorske, Wittgenstein's philosophy as a response to the *fin de siècle* crisis, later suggested that strands of Viennese "critical modernism" represented continuity rather than a break with liberalism.¹⁰ My own work underlined the existence of a progressive liberal camp in *fin de siècle* Vienna, optimistic, reform-oriented, enthusiastic about technology and popular education, sustaining liberal values but cognizant, especially in the philosophy of science, of modernist ideas.¹¹ Jacques LeRider rendered the *fin de siècle* crisis as a progressive fragmentation of the liberal subject and Viennese modernism as a series of postmodern responses to the crisis of identity.¹² No one has questioned the liberal crisis or its relevance to modernism. Rather, we have been debating the nature of Viennese liberalism, the roots of its crisis, and its relationship with modernism. We have all been laboring within the Schorskean paradigm.¹³

Coen thinks we have been doing so for too long. She disputes what she regards as central tenets of the Schorskean paradigm. Viennese liberals, she argues, were not the theoretical and moral absolutists Schorske describes. Probability theory and indeterminist physics were trademarks of Austrian liberal science. The liberals developed a unique scientific and political culture grounded in a probabilistic universe, in the presupposition of uncertainty. Schorske misconstrued the relationship between the liberals and the Viennese modernists. Uncertainty was not a modernist adversary of liberalism but an essential dimension of liberalism itself.

Scientific cultures throughout Europe promoted scientific education as essential to character formation, but the Austrian liberals alone, says Coen, made uncertainty central to their educational platform. With uncertainty came the demand for spontaneity, experimentation, and trial and error, for the student's

⁹ Lothar Höbelt, *Kornblume und Kaiseradler: Die deutschfreiheitlichen Parteien Altösterreichs 1882–1918* (Wien: Verlag für Geschichte und Politik, 1993).

¹⁰ Allan Janik and Stephen Toulmin, *Wittgenstein's Vienna* (New York: Simon and Schuster, 1973); Allan Janik, "Vienna 1900 Revisited: Paradigms and Problems," in Steven Beller, ed., *Rethinking Vienna 1900* (New York: Berghahn Books, 2001), 27–56.

¹¹ Malachi Hacothen, *Karl Popper—The Formative Years, 1902–1945: Politics and Philosophy in Interwar Vienna* (New York: Cambridge University Press, 2000), esp. 34–61.

¹² Jacques Le Rider, *Modernité viennoise et crises de l'identité* (Paris: Presses Universitaires de France, 1990).

¹³ Steven Beller, editor of *Rethinking Vienna 1900*, a volume assessing the Schorskean paradigm, disagrees (esp. 11–20).

freedom to trip and temporarily fail. In contrast, the French and German reformers' emphasis on scientific laws' immutability and predictability entailed a more rigid educational program. The contrast with Germany, Coen might have added, went further. Whereas the German mandarins advanced a humanistic *Bildung*, antagonistic to natural science, and encountered, in the Monists, a progressive democratic reaction seeking to replace humanistic education with science, the Austrian liberals insisted on natural science as integral to *Bildung*, on the convergence of the humanities and natural-science education. This education, the liberals surmised, was a training ground for politics, which, much like probabilistic science, required balancing order and uncertainty. Liberal moral and political authority was founded on the ability to manage uncertainty. Hence its central dilemma: how can you sustain authority, founded in doubt, against opposing political currents claiming exclusive access to truth?

Nineteenth-century Austrian scientific culture was a product of patrician liberalism, and incompatible with democratic culture and education. The liberal family, Coen argues, was a crucial formative site for both science and liberalism. She insists that scholarly neglect of domestic life resulted in a major misunderstanding of the character and political import of Viennese liberalism and science. If the family was the laboratory for liberal character, science, and politics, then neither engagement in the private sphere nor scientific commitment could signal, *pace* Schorske, a liberal retreat from politics. The boundaries between private and public were porous, at least in good times, and the home itself was a site for the formation of "a self that is both independent and related . . . a transitional space, bridging the public and private life of its inhabitants" (23). Schorske fell for the widely shared rhetoric, best articulated by Popper, identifying science with the public sphere. The great scientific families of the nineteenth century, the Darwins, De Broglies, Exners, and Huxleys, offer a different model. "Demarcating public from private is always a political act, and we need to learn how historical actors mapped it," says Coen. The Exners viewed family, science and politics as of a piece, the family and scientific culture alike providing political models. We must "rethink the linked dichotomies at the heart of Schorske's thesis—between reason and uncertainty, publicity and privacy" (3).

Coen wonderfully illuminates the domestic life and culture of the Viennese liberal patricians, sensitively probes the intimate relationship between their scholarship and politics, and highlights the cogency and vitality of Viennese liberalism. But I do not think she views her relationship with Schorske correctly. Her rethinking of Schorskean dichotomies is commendable but it is less consequential to Schorske's narrative than she assumes. She refines the Schorskean paradigm at the edges but her narrative, focusing on figures that singly embody Schorskean liberalism, actually sustains his account and shares its merits and limitations. Her conception of liberalism is at least as narrow as

Schorske's, limited to the *Bildungsbürgertum*—the Exners embody liberalism, and the nationalists, the progressives, and most of the Jewish intelligentsia are out. The crisis of liberalism remains a major trope: the rationality and harmony of the Exners' probabilistic universe come under threat from the variety of democratization—Catholic, nationalist, progressive and socialist. Coen strives to relax the boundaries between the private and the public, Brunnwinkl and Vienna, to show that, *pace* Schorske, there was no liberal retreat from politics. Alas, she herself detects in Brunnwinkl, from the 1890s on, the mentality of the besieged, exemplifying Schorske's understanding of the liberal crisis. Brunnwinkl becomes a summer retreat rather than a *Sommerfrische*, the boundary between the private and the public redrawn. Like Schorske, Coen leaves the major riddle of Austrian liberalism, its rapid devolution into German ethnonationalism, unresolved. Unlike Schorske, she has to confront the results of the ethnonationalist transmutation of liberalism—several third-generation Exners professed their Nazi allegiance. She has no convincing explanation. Coen's narrative reads to me more Schorskean than any recent book I have seen. The narrative is enchanting, even when it is not altogether persuasive.

FAMILY AND SCIENCE IN BRUNNWINKL: LIBERAL NOSTALGIA AND UTOPIA

Coen crafts her narrative as a series of chronological episodes representing the intersection of family history, scientific innovation and liberal politics. Combining the three is a challenge, and she meets it with finesse. She speaks of the Exners as having left “a wealth of memoirs and letters,” but the archival records cited appear insufficient for a complete family history. Coen makes extensive use of autobiographical narratives and limited correspondence to highlight aspects of family life. The narratives, she notes, represented conscious efforts to shape historical memory of the family and, one might add, mythologize Brunnwinkl. The Exners' scientific advances are at the center of most episodes, and Coen provides intellectual context to illuminate their significance but does not do so exhaustively. She maps out several fields in nineteenth- and twentieth-century Austrian philosophy and science but this contribution to Austrian intellectual history is tangential to her narrative. She wishes most to illuminate the way family life in Brunnwinkl facilitated the Exners' discoveries and, in turn, the way their scientific conjectures reflect liberal politics. She draws the political significance of each scientific episode by selectively setting up Austrian politics to show the resemblance of family, science, and politics. The interworking of the three drives the narrative, and Coen keeps it under control by claiming unusual coherence for the liberal project—family, science and politics all displaying the balance of spontaneity and order.

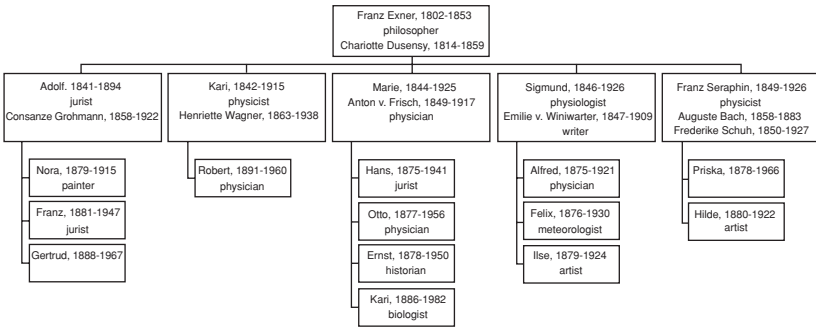


Fig. 1. An Exner–Frisch family tree. Coen, *Vienna in the Age of Uncertainty*, 353.

The dynasty's founder, Franz Exner, emerged from modest middle-class circumstances to become a professor of philosophy in Prague. There he came under the influence of Bernard Bolzano (1781–1848), the philosopher whose logic pervaded Austrian textbooks until the turn of the twentieth century. In the aftermath of 1848, Exner, as an adviser to the Education Ministry, outlined Austrian school reform. Applied by his disciples in the 1850s, the reform modernized Austrian gymnasia and made them Europe's envy. Exner taught an empiricist philosophy grounded in a sensationalist psychology, developed a pedagogy that cultivated skepticism about theology, and introduced German literature into the classical curriculum. He attacked Hegel's philosophy as determinist and reactionary and proposed a probabilistic view of judgment that emphasized diversity, individual agency, and self-discipline. His student, Robert Zimmerman (1824–98), the most powerful Austrian philosopher for four decades, transformed his legacy into an Austrian tradition: empiricist, sensationalist, anticlerical, anti-Hegelian, probabilistic, focusing on pedagogy and the formation of the liberal subject, and persuaded that skepticism is a necessary stage on the way to knowledge.

The five Exner children, orphaned from both their parents at a young age, grew up apart from each other, and matured intellectually in the 1860s, at the height of liberal influence. Coen emphasizes the importance of summer get-togethers in shaping the Exners as a family and a scholarly community. Their interests ranged across the natural sciences, the arts, and law. The oldest brother, Adolph, contributed to modernizing commercial law, domesticated the German Historical School in Austria, and, as Vienna University's rector (1891–3) and member of the Imperial Court (*Reichsgericht*) and the upper house of parliament (*Herrenhaus*), defended liberal political culture. The second brother, Karl (1842–1915), was a physicist, the single sister, Marie von Frisch (1844–1925), an amateur painter and the founder and manager of the Brunnwinkl colony.



Fig. 2. Brunnwinkl, c.1906. Frontispiece to Ernst Frisch, *Chronik von Brunnwinkl* (Vienna: Selbstverlag des Verfassers, 1906).

Brunnwinkl became the Exners' summer retreat in the 1880s. In the years before, they had vacationed frequently in the area, on lake Wolfgang in the Salzkammergut, east of Salzburg, a region still inaccessible by railroad. The *Sommerfrische* in the Alps was an established bourgeois rite, and the charms of rural life were a common motif in urban culture. In the summer of 1882, Marie, her husband Anton, and their family rented the upper floor of farmhouse in Brunnwinkl, a tiny community of mostly downtrodden artisans, in the vicinity of the village of St Gilgen. By the summer's end, the Frisches purchased the house. In the following years, they bought four adjoining houses, turning Brunnwinkl into a vacation colony for the extended Exner family.

Not all Exners vacationed in Brunnwinkl. Adolph came only for short visits. The younger brothers, Sigmund and Franz Serafin, however, spent there much of the summer. Neurophysiologist Sigmund (1842–1924) was chair of physiology at Vienna, a ministerial adviser on medical education, and a noted researcher on color theory and visual memory. His wife Emilie, née von Winiwarter (1847–1909), was an accomplished writer, noted also for her work on reforming women's education. In 1906 she published a first account of Brunnwinkl. The youngest brother, Franz Serafin, was the architect of "Vienna indeterminism"—the probabilistic view of the universe—and the teacher of a generation of Austrian physicists. As Vienna's rector (1908–1912), he defended academic freedom against clerical and nationalist incursions. As the Exner grandchildren were joining

Brunnwinkl in the 1880s and 1890s for a summer on the lake and in the woods, it grew into a bustling rustic community of five cottages. Scholars on their summer retreat nearby dropped in for visits. Brunnwinkl was a vital intellectual community, a mini public sphere.

Coen views Brunnwinkl as a liberal utopia come true. Franz Exner dreamt of enjoying his grandchildren with a thriving family in a country home. His student and fellow school reformer, Adalbert Stifter, provided the model for the country home in *Der Nachsommer* (Indian Summer; 1850): a home that is a refuge from politics and fashion where the family is able to shape the character of youth in light of liberal ideals. The portrait was fictional and ideological, the *Bildungsbürgertum* imagining family, home, and education the way they should be—harmonious, balanced, rational, free of conflict. The Exners portrayed Brunnwinkl using Stifter's tropes, and Emilie Exner declared Brunnwinkl the fulfillment of Franz Exner's dream. Coen, aware of the dream-work, is reluctant to disabuse Emily—and herself—of the illusion. She does not query the Exners' portrayals but uses their language to explain Brunnwinkl and trace its reflections in liberal science and politics. The Exners created the Brunnwinkl myth; Coen assures it remains liberal.

Similar dreams do different ideological work in different historical periods. *Der Nachsommer*, a *Bildungsroman*, provided a blueprint of liberal education for such a time when the *Bildungsbürgertum* might be in a position to govern Austria. The Brunnwinkl myth, in contrast, emerged as nostalgia for a lost liberal world, Emily Exner bemoaning the changing times around the Wolfgangsee. Nostalgia can round more than rough edges. Brunnwinkl fragments suggest that the liberal utopia was replete with generational and gender tensions and with class and ethnic anxieties. After the death of his wife in 1883, Serafin Exner did not draw close to his daughters, Priska and Hilde, for their entire childhood and youth: "now that it is finally clear that *we* have a dear and good father and *you* have daughters," wrote Priska in the late 1890s, "our whole life will be much happier" (quoted at 117–19). They grew up as "tomboys," "wild" and never "reared," playing the lady defending the castle against the knight. (Coen views this education as exemplifying liberal spontaneity. One wonders. Does it accord with Emilie or Sigmund Exner's view of gender roles, not to mention Stifter's elevated view of liberal education?) Artists Nora and Hilde, daughters of Adolph and Serafin, rebelled in 1902, decorated the resort with modernist paintings, and, three years later, departed on their own on a prolonged Italian expedition. The children enlisted in the World War I effort, ignoring Serafin's advice to the contrary, some of them having already become fervent German nationalists. Of those who lived to see the *Anschluss*, a majority supported the Nazis. If "inheritance" was, as Coen suggests, Austrian liberalism's motif, it is not clear that Brunnwinkl sustained it.

The best-kept secret among the Exners was the Jewish origins of the matriarch, Charlotte Dusensy (1814–59). Their partial Jewish descent proved sufficient for

the Nazis to remove some of the grandchildren from their academic positions. It was a source of anxiety to family members. Serafin Exner's circle included many scientists of Jewish origin, but there appear to have been few Jews among the Exners' closest friends, and most belonged to the older assimilated *Bildungsbürgertum*, like the Gomperzs. There were also anti-Semites. As leading Vienna faculty, the Exners had to thwart criticism of the Jewish profile of the graduating medical class by a Brunnwinkl friend, Theodor Billroth. As anti-Semitism surged and assimilation became difficult, Emilie Exner found she could no longer discuss the Jewish question with family friend Josef Breuer: "And yet," she complained, "one still denies that racial peculiarities exist" (quoted at 178). She decried Arthur Schnitzler's *Der Weg ins Freie* (The Road into the Open; 1908), which presented a troubled liberal bourgeoisie unable to resolve the Jewish question. Instead, in a memoir of a friend, Josephine von Wertheimstein (née Gomperz), she presented the Wertheimsteins' salon as embodying the liberal golden age, and assured the reader that neither by character nor by look did they resemble Jews.

Emily's ethnic discomfort seemed to converge with her class anxieties, and, as such, was a bad omen. The Exner brothers presided over a university that made the mercurial Jewish rise in the professions possible. The liberal order was crucial to the Jewish advance, and Emily's anxieties reflected its crisis. On the Wolfgangsee, the Frisch-Exners displaced debt-ridden artisans and inherited their homes. From the start, they romanticized the farmer and hunter and craved to be recognized as locals. After the turn of the century, their claims to belong became desperate. Emilie complained about commercial tourism and the hideous modern villa nearby, built by the newcomers, a Viennese bourgeois Jewish family. She took pains to weave Brunnwinkl into the environment and contrast the Exners' adaptation to nature with the nouveaux riches' rude intervention. The *Bildungsbürgertum*'s romanticization of rural life was acquiring anti-Semitic overtones. Emilie signaled the beginning of a shift in the family's survival strategy, wagering the family's inheritance on local acceptance instead of on political progress, on *Heimat*—the provincial, romantic, xenophobic "homeland"—rather than on liberal universalism. By the 1930s, Hans and Ernst Frisch's Brunnwinkl sagas were embedded in *Heimat* discourse.

Coen partakes in the Exners' romanticization of rural life. The Exners occasionally suggested that the hunter and the farmer provided models of human reasoning (although they hastened to point out their limits). Coen concludes that the Exners culled modes of rationality from the locals. For Sigmund Exner, the hunter embodied the ideal of reason in action and the instinctive operation of the human mind. It shaped his theory of visual memory. For Adolph Exner, the farmer was a model of the diligent paterfamilias, coping with an unpredictable environment, a resource for understanding *force majeure* in commercial law. Coen acknowledges that, when speaking of themselves as hunters, the Exners were

engaged in self-fashioning, but, all the same, she likens their field research—such as observation of plants and animals—to hunting. She naturalizes the Brunnwinklers to sustain her claim that Brunnwinkl, where “nature entered through every crevice” (255), was a laboratory of liberal science. The hunter and farmer become metaphors portending the meaning of the Exners’ scientific culture. Perceptive though these insights are, Coen endows the metaphors with excessive power. They are difficult to evaluate critically, and they sidestep a range of contextual explanations. They conceal the ideological work of turning “rural” and “hunt” into “natural,” repress the violence of hunting, and call attention to aspects of the Exners’ life that may not after all be central to their project.

The Exners did do science in Brunnwinkl. Some of it may have happened, as Coen suggests, on their nature hikes. Sigmund Exner observed insects’ color choice (although the major experiment for his color theory, involving two hundred volunteers, took place elsewhere). There were dinner conversations about physics. Serafin began in Brunnwinkl, early in World War I, his renowned *Vorlesungen über die physikalischen Grundlagen der Naturwissenschaften* (Lectures on the Physical Foundations of Natural Science).¹⁴ For the Exners’ third generation, the evidence is decisive. Karl von Frisch had in Brunnwinkl his insect “museum” and conducted experiments on the language of bees. Felix Exner (1876–1930), “the father of statistical meteorology,” conducted heat transfer studies on the Wolfgangsee, and, in later years, atmospheric measurements around the Salzkammergut. Serafin Exner had his students, among them physicist Erwin Schrödinger (1887–1961), measure the atmosphere’s electric charge in Alpine settings, occasionally near Brunnwinkl. Brunnwinkl science was imbedded in a broad scientific network, predominantly urban, public, and international, but there can be no disputing that Brunnwinkl was a site for the making of science.

Coen’s claim, however, is more radical. She wants Brunnwinkl to be, it seems, *the* site for the production of liberal science. This should make it possible for the family to become the primary scientific community, and for Coen to mount a challenge to science’s public character. Since the Exners spent most of their life in Vienna, Coen seeks to locate the creative impulse in Brunnwinkl, to fold into Brunnwinkl as many scientific episodes as possible, and to show that, in an urban setting, too, the Exners’ scholarly network carried the patrician family’s imprint. Even as she outlines international meteorological controversies and describes Serafin Exner’s students conducting experiments all over the globe, she speaks of “Alpine physics,” first collapsing the globe into the Alps, then into the *Salzkammergut*, and finally into Brunnwinkl. Marian von Smoluchowski’s

¹⁴ Serafin Exner, *Vorlesungen über die physikalischen Grundlagen der Naturwissenschaften* (Leipzig und Wien: F. Deuticke, 1922).

training in Alpine physics, she says, was key to his innovation on the Brownian motion (movement of molecular particles):

The naturalist view he nurtured on his hikes and in his atmospheric research shaped his strategies as a theorist. He proceeded not as Einstein, on the basis of general principles, but in the manner of a naturalist observing the course of a process, or a hunter tracking his prey. (267)

This is beautifully crafted, but it is not persuasive. Brunnwinkl could become a scientific site precisely because every move the Exners made was grounded in scientific traditions, a product of controversies in the research field, and targeted at the broader scientific community. The steady cross-exchange between Brunnwinkl and Vienna, between domestic and public life, amply demonstrates the permeability of the boundary between the private and public spheres. Paradoxically, Coen's endeavor to fold science into the family risks redrawing the very boundary she wishes to erase.

Liberal science did retain more of a domestic character than we often assume. Coen's observations that liberal academic circles resembled extended patriarchal families, with assistants marrying their mentors' daughters, are perceptive. This does not mean, however, "private science." Multiple "families" constituted a public sphere, with scientific debates decided not exclusively within the "families" but among them. Coen appropriately defines Brunnwinkl as a "public" domestic space (26). The Exners were exceptional in that the extended family circle, replete with scholarly talent, could replicate the public, and yet remain intimate. The Exners may have wished for the liberal family to be a model for the public order, but the opposite was true: Brunnwinkl blurred the boundary between private and public by emulating the public sphere in miniature.

Upholding the family as a political model in a progressively democratic age represented serious problems. Austrian liberalism retained strong aristocratic dimensions later than its western European counterpart. The *Bildungsbürgertum* seemed to embody the ancient regime's nexus of family, salon, and court. Yet liberalism also upheld egalitarian citizenship, and the promise of a democratic expansion through education. Liberals, it is often argued, fashioned egalitarian politics by concealing the public sphere's dependency on the private—on the patriarchal family.¹⁵ The Exners wanted to do precisely the opposite—to fashion liberal politics after the patriarchal family—but the patriarchal family could not provide a model for an increasingly democratic polity. Emily and Sigmund found themselves in a thicket of contradictions when planning for public education (of both men and women). *Fin de siècle* progressive reformers shared their conviction about science cultivating rational citizens but wished for school, not

¹⁵ The *locus classicus* is Joan B. Landes, *Women and the Public Sphere in the Age of the French Revolution* (Ithaca, NY: Cornell University Press, 1988).

the family, to become the primary socialization agent. The Exners balked, Emily complaining about the regimentation of public schooling, contrasted with her family's free natural environment. Her anxieties reflected a mixture of class and gender concerns: diminishing the family's and the salon's public role, democratic politics diminished also upper-class women's political significance (while opening new opportunities to others). Planning for democratic public education, the Exners were legislating away their institutional power bases. Their ambivalence is understandable.

Latter-day Exners would recall the happy family of *fin de siècle* years, just as Emily recalled fondly the liberal golden age. Yet Brunnwinkl embodied liberalism in retreat, providing a refuge, its seclusion assuring autonomy, making the fashioning of a small liberal polity possible. The Exners did not give up easily on the capital. The second generation's rise to academic eminence corresponded with the crisis of liberalism. Throughout the 1880s and early 1890s, they hoped to continue to shape Austrian politics and culture by using their remaining power bases—extended family, universities, and administrative connections. Their scientific projects continued to project optimism even later, all the way to World War I. Brunnwinkl could become a base to regroup and reconquer the capital. But as they came under nationalist and clerical siege in their own strongholds—the gymnasia and the universities—it became clear that, on the contrary, the refuge itself was at risk.

For good and bad, the Exners wanted to remember a perfect Brunnwinkl. Their portraits and chronicles celebrated Brunnwinkl's anniversaries and shaped the family's past to address contemporary concerns: from Emily and Ernst in 1906, when the *Bildungsbürgertum* felt it was under siege, to Hans and Ernst in 1931 and 1938, when provincial fascism and National Socialism presented new challenges, to Franz in 1944, when German defeat in World War II appeared probable. Like the Exners, Coen refuses to concede defeat. She shows the Exners' greatest theoretical and scientific accomplishments coming at the height of crisis, when their critics had already consigned liberal culture to oblivion. Vienna indeterminism was the crown jewel of the Exners' achievements.

UNCERTAINTY? LIBERAL PROBABILITY POLITICS

“Vienna indeterminism” is the term Michael Stoeltzner used to christen the tradition in physics emerging from Ernst Mach and Ludwig Boltzmann and issuing in Erwin Schrödinger and the Vienna Circle.¹⁶ Franz Exner stands at

¹⁶ Michael Stoeltzner, “Causality, Realism and the Two Strands of Boltzmann's Legacy (1896–1936),” Ph.D. diss., Universität Bielefeld, 2003, available at <http://bieson.uni-bielefeld.de/volltexte/2005/694/>; *idem*, “Vienna Indeterminism: Mach, Boltzmann, Exner”;

the center of his account as synthesizer of Mach and Boltzmann and founder of the statistical world view. Coen focuses less on the tradition's intellectual history. Rather, she seeks to present the conjunction of a probabilistic universe and liberal politics as the distinctive feature of the Exners' philosophy of science. She expands Vienna indeterminism across the family and insists that a liberal metaphysics underlay the diversity of their projects from physics to psychology to politics and education. All represented a universe of probabilities.

Nature and history, physics and politics, were not just homologues to the Exners—they had a unified structure. A determinist universe, they surmised, would unduly restrict human agency, and certainty and “absolute laws” would undercut liberalism. There would be little room for cultivating individuality or for voluntary action. A probabilistic world solved the old problem of determinism versus freedom of the will without undermining scientific knowledge.¹⁷ The liberal subject, the rational citizen, had room for action without being threatened by disorder. But, to cultivate citizenship, science had to remain liberal—that is, probabilistic. Adolph Exner warned, in his 1891 rectoral address, that politics should not be modeled on the wrong natural-science ideal. Politics and science alike were about managing contingency and were not susceptible to absolute laws. Responding, among others, to Catholic demands for firm educational principles and progressive and socialist proposals for scientific restructuring of education and politics, Serafin Exner argued, in his 1908 rectoral address, that *Rechtsstaat* liberalism—and, he might have added, markets too—dealt most adequately with agents' independence and individuality. The liberal political order was natural, anchored in a probabilistic universe.

Probabilism was not, of course, a product of the political imagination alone. It emerged from the Exners' diverse scientific projects. Sigmund Exner's theory of the associative mind (memory) deployed statistical probability to sustain his notion of the “normal eye” and explain the universal effect of certain images. Adolph Exner found the jurist's work on the laws regulating commercial risk facilitated when thinking of agents confronting uncertainty with a probability calculus. The final, and decisive, push for Vienna indeterminism came with the ultramicroscope, the detection of the irregular path of molecular particles,

Synthese 119 (1999), 85–111. Hiebert discusses similar themes under the rubric of the “Austrian Revolt in Classical Mechanics.” See Erwin N. Hiebert, “Common Frontiers of the Exact Sciences and the Humanities,” *Physics in Perspective* 2 (2000), 6–29.

¹⁷ John Beatty has written (email to author, 29 Sept. 2008): “Probabilistic laws do not really solve problems of determinism vs. freedom . . . If alleged laws of societal development, or the course of human history, were probabilistic, one might still feel very uncomfortable about the odds of things turning out for the worse.” Indeed. After World War I, the Exners felt exceedingly uncomfortable about the odds. But the problem continued to be debated in these terms at least throughout the interwar years.

and the discovery of radioactivity. Measured as frequency alone, radioactivity provided the classical definition of randomness and gave rise to statistical laws. Randomness, ineradicable variability, became characteristic of nature itself, not a matter of imprecise measurement. Chance became a feature of the world, not a result of human ignorance, a human failure to establish causality. Indeterminism and “objective probability” became the defining features of Viennese physics.

Coen regards the Exners’ probabilism as the lynchpin of her case against Schorske. Viennese liberals were not hopeless backward-looking absolutists but the avant-garde of modern physics, seizing on the uncertainty characteristic of modernism. She is right about the Exners but wrong about Schorske. For one thing, probabilism did not represent a liberal consensus. Coen details the disputes over probability among liberal psychologists and philosophers. They make it clear that Schorske’s absolutists were alive and well. She may also exaggerate liberal uncertainty: the liberals had no doubt that rational order existed. Probability captured and tamed chance. Friedrich Jodl (1849–1914) spoke of mastering chance (242), Serafin Exner of disciplining a contingent universe, so it yielded data ranging from the very probable to the merely possible. None suggested, as Popper would, that knowledge, or scientific laws, remained forever conjectural and required no metaphysical commitment to a lawful universe. None endorsed, as Popper would, the unpredictability of history—the idea that there were no historical laws, not even probabilistic ones. Such radicalism could undermine liberal authority. The universe had to be lawful so that science would yield true knowledge with varying degrees of certainty and the liberals could expertly manage risk. The liberals vied for probability precisely because it contained the chaos they saw emergent in modernist art and made liberalism indispensable. Schorske may have not been attuned to their probabilism but he grasped well its drift: the liberals were still looking for a foundation in a world in flux.

Unlawful nature, sensed the liberals, threatened the very possibility of rational politics. Kant separated nature and morality, fact and value, but the Exners, like the overwhelming majority of Austrian liberals, were anti-Kantian empiricists. At no time were they ready, or able, to sever the nexus between science and politics, *physis* and *nomos*, let alone declare politics a matter of convention. Serafin Exner saw his *Der schlichten Astronomia* (Simple Astronomy) as a work of *Bildung*. Metaphysical lawfulness seemed a political imperative.

Probabilism was a far cry from Klimt’s *Philosophy*. A photo of *Philosophy*, the designated university mural that evoked a public scandal, appears on the opening page of Coen’s book. However audacious she has rendered the Exners, she still needs to explain their confrontation with Klimt. She does so ingeniously: not certainty but communicability was the central issue between the scientists and the artists, she says. The Exners resisted the modernist closure of aesthetics to rational conversation. Serafin Exner responded similarly to Oswald Spengler’s

subjectivist interpretation of probability in the aftermath of World War I.¹⁸ No particular scientific theory was at issue but rather the possibility of scientific debate itself. Coen modifies Schorske: her liberals appear to be advancing a late modern conception of rationality—communicative rather than foundationist. Yet she also recharts the fault line Schorske has drawn between Viennese liberalism and modernism. The chasm between modern science and modernist art remains open.

Tenuous though the uncertainty the Austrian liberals accommodated may have been, Coen has illuminated an essential feature of liberalism, of significance way beyond Vienna. The liberal affinity for probabilism, the dread of determinism and chaos, reflected the need to assure a measure of freedom and openness for debate and negotiations. Suspension of absolutist claims appears as a permanent requisite of liberal morality and politics. Isaiah Berlin made similar points in his critiques of determinism and monism.¹⁹ So also has liberalism's critic, Carl Schmitt.²⁰ With the suspension of absolutist claims came the dilemmas of liberal authority: discussion and negotiation often did not contain conflict, the liberals having to resort to bureaucratic subterfuges to reach decision, all the while, said Schmitt, obfuscating the fundamental irrational political decision—friend or enemy? The liberals wished to diminish the irrational, but how could one tame the crazed nationalists by arguing the suspension of belief? Liberalism found itself defenseless but Coen appreciates its culture of debate all the more for its dilemmas. Her exploration of the relationship between liberalism and indeterminism stands out as one of the book's achievements.

DECIPHERING THE EXNERS' FAILURE: GERMAN NATIONALISM AND THE TRANSMUTATION OF AUSTRIAN LIBERALISM

Austrian liberalism failed to pass on its political legacy. Throughout the twentieth century, Austria had no major Western-style liberal party. The liberals did not simply vanish, at least not immediately. In Vienna they succumbed to the Christian Socials but, outside of Vienna, especially in the Czech Crownlands, they remained a major force, representing German ethnic interests. German

¹⁸ The episode is recounted in detail in Michael Stoeltzner, "Franz Serafin Exner's Indeterminist Theory of Culture", *Physics in Perspective* 4 (2002), 267–319. Responding to German historical relativism and determinism, Exner sought to rescue a glimmer of hope for liberal culture.

¹⁹ Isaiah Berlin, *Four Essays on Freedom* (New York: Oxford University Press, 1969).

²⁰ Carl Schmitt, *Die geistesgeschichtliche Lage des heutigen Parlamentarismus*, 2nd edn (Berlin: Duncker & Humblot, 1926); *idem, Der Begriff des Politischen* (Hamburg: Hanseatische Verlagsanstalt, 1933).

nationalism, defined increasingly racially, took over the liberal camp. When Camillo Kuranda, son of Ignaz Kuranda (1812–84), among the liberal party's founders and leaders, was elected to the Reichsrat in 1907 as a representative of the Deutsche Fortschrittspartei (German Progressive Party), he faced exclusion from the parliamentary Deutschnationaler Verband (German National Club) on racial grounds. By the interwar years, the *Deutschliberale* shed any liberal pretension—anticlericalism excepted—and joined to form the anti-Semitic Grossdeutsche Volkspartei (Pan-German People's Party). They were virtually wiped out by the National Socialists in the 1932 regional elections, only to remerge in the postwar years in different metamorphoses of the Austrian Freedom Party, mercifully kept out of government for most of the Second Republic. Liberalism remained alive mostly in the culture of predominantly Jewish intellectual circles, among the émigrés and, most distinctly, in Austrian philosophy of science.

Coen glosses over the thorny problem of the relationship between liberalism and nationalism. She sees democratization as the root cause of the liberals' downfall and does not query the particular forms it took. Even more than Schorske, she talks about the liberals' predicament the way they spoke about it themselves, obscuring their devolution into ethnonationalists. She seems genuinely perplexed to find the third generation of Exners turning Nazi. She is eager to exculpate the liberal parents of the Nazi children's sins and intimates that the children's political choice was contingent: had the socialist Felix not died prematurely, had Nora and Hilda, who would have become socialist, not died prematurely, the Exners' political profile would have been different (as if socialism immunized against Nazism). She discerns a generational rebellion (which did, indeed, occur but took diverse forms).²¹ She finally suggests that the wish to protect the family, which had traditionally depended, like the rest of the

²¹ Coen uses Friedrich Adler (1879–1960), son of Victor, the founder of Austrian Social democracy, and Bettina Gomperz (1879–1948), daughter of the famous liberal classicist Theodor, as examples of a generational rebellion. They rebelled but they do not belong in the Exner story. Neither became Nazi (both were full Jews under Nazi racial laws); Bettina was not even a nationalist (from World War I on, she lived in Switzerland). Adler served until 1946 as secretary of the Socialist International and went into exile in the US during World War II. Bettina's oldest brother, philosopher Heinrich Gomperz (1873–1942), would have served Coen better to illustrate the transition from liberal parents to nationalist children. One of the few diehard Jewish Pan-Germans, he refused to join, in 1934, Dollfuß's *Vaterländische Front* (Fatherland Front) on account of its opposition to German unification. He was retired from his Vienna professorship, and, from his US exile, he endorsed the *Anschluss*. His brother Rudolf Gomperz died in a concentration camp in 1942. Rudolf declared his two sons illegitimate to protect them under racial laws. Both became Nazi and at least one served in the Waffen-SS. The Gomperzs encapsulate the ironies of Jewish Austro-German liberalism. The Exners look conventional by comparison. Rossbacher, *Literatur und Bürgertum*, 533–84.

Bildungsbürgertum, on state patronage, was a cause for the Exners' collaboration. This may all be correct but it treats the young Exners' shift from liberalism to ethnonationalism as if it were anomalous, whereas it was typical. The youth who had been cheering Serafin Exner in his defense of academic freedom against clericalism in 1907 were not, like him, mild liberals but German nationalists. By 1914, Serafin's opposition to the war made him a political relic, representative of an older liberalism, found mostly among the Monists and Freemasons. The Exners' generational pattern is just what a historian of Austrian liberalism would expect. Yet Coen's puzzlement is understandable. Austrian liberalism's implosion and devolution into German ethnonationalism is its greatest riddle.

Austrian liberalism's nationalist transmutation has international parallels. Throughout central and western Europe and North America, late nineteenth-century liberalism often, although not always, became hypernationalist and imperialist. Everywhere, liberalism was responding to democratization and the pressures for social reform in the wake of the Second Industrial Revolution. Everywhere, the liberal response represented a new stage in nationalization. In central Europe, an area of unsettled ethnic boundaries, nationalization proved highly disruptive. The emergent national consciousness of the different minorities inhabiting the Habsburg Empire led to protracted ethnic and cultural conflicts, and the ones in Bohemia and Moravia threatened the hegemonic Germans, who had long regarded themselves the *Staatsnation*. The defense of German ethnic interests became the liberals' primary concern. Liberal nationalism acquired virulent forms and became hardly recognizable.

The expansion of the suffrage in Austria, the political involvement of growing segments of the population, and the industrialization of parts of the empire spelled a modernization ridden with national anxieties. The authoritarian state inhibited the development of democratic mass parties, creating the conditions for populist politics. Both the Christian Socials and the Pan-Germans discovered that drawing ethnic and cultural boundaries, and projecting modernization's anxieties onto the "other," proved of enormous popular appeal. The socialists were the only exception—a partial one—to the rule that the more socially progressive a political movement was, also the more anti-Semitic. The *Bildungsbürgertum* and its liberalism could not long survive in this environment. Liberal continuity—or "inheritance," to use Coen's language—became exceedingly difficult. Everywhere, liberalism had to adjust to modernization or die. In Austria, its adjustment was also its death.

Did liberalism succumb to populist attacks or was the problem liberalism itself, its evolution into ethnonationalism reflecting inherent tendencies? Schorske and Coen emphasize external pressures; Boyer, Höbelt, and Judson—from very different perspectives—internal development. Hannah Arendt's acute perception of the nation state's dilemma, in *The Origins of Totalitarianism*, may help account

also for Austrian liberalism's inherent difficulty: realization of "universal" human rights proved dependent on citizenship, and citizenship became controversial, especially in central Europe, "one of the most [ethnically and culturally] mixed of all the thoroughly mixed regions of Europe" (according to Popper).²² The liberal parents made German *Bildung* a precondition of citizenship. However elitist their conception, it left admission open, if not easy. The Jews were only too glad to abide by the conditions of admission. The ethnonationalist children drew the boundaries racially, making Jewish integration impossible. Coen sensitively notes, in the course of her discussion of *fin de siècle* education reforms, how the Exners' emphasis on the patrician family as a precondition for *Bildung* was closing down previously open gates to citizenship. She correctly diagnoses their move as reflecting class anxieties. But similar, and more effective, closure was taking place on the ethnic plane. Coen's narrative sounds the warning on many occasions but she pays little heed to them. The Exners could provide an ideal site for charting liberalism's transformation and arbitrating scholarly debates on its causes. Coen declines the opportunity. I would like to take advantage of it, using the signposts she provides.

The transmutations of Austrian liberalism reflected its continuous struggle with the German Question. Dynastic founder Franz Exner urged his newlywed wife in 1841 to remember that she lived "for the power and glory of Germany: your sons will likely one day have to fight against the presumptions of the French and Russians" (46). Germany was still a loose confederation including Austria, and German nationalism an emergent, diffuse, oppositional force encountering Prussian and Austrian resistance. But the founder's military and Pan-German sentiments make the pacifism of a minority in the *fin de siècle* liberal intelligentsia, including his son Serafin, seem all the more exceptional. The failure of German unification in 1848–9 found Exner and fellow moderate liberals redirecting their efforts to Austrian reform without giving up altogether on the Great German dream. Only the forcible exclusion of the Habsburg Empire from Germany in 1866 ended the dream—for a while. Austrian liberals had now to redefine their German patriotism and renegotiate it with imperial loyalty. *Bildung* as *Deutschtum* ("Germanity") and propagation of German culture throughout Austria was their solution. They defined Austro-German nationalism culturally, allowing Austrians (and other German-speakers) membership in the German cultural sphere (*deutsche Kulturbereich*). Declining a Leipzig offer in 1891, Adolph Exner said, "What holds me here is basically banal patriotism . . . I cannot leave

²² Popper, *The Open Society*, 2: 48. For Arendt see Hannah Arendt, *The Origins of Totalitarianism* (New York: Harcourt Brace Jovanovich, Publishers, 1958), 267–302: "The Decline of the Nation-State and the End of the Rights of Man."

my home and country [and] as a good German, I can serve the cause of German *Bildung* here better" (p. 138).

This precarious balance of Austrian patriotism and German culture, typical of the liberal era (1861–79), was already under attack in 1891. The rise of Pan-Germanism in the 1880s challenged Austrian patriotism. While few were ready to dismantle the empire to join Germany, as Schönerer proposed, mounting ethnic tensions disrupted the liberal German *Kulturbereich*. German nationalists were making strides in converting a partially inclusive liberal *Kultur* into an ethnic category. The *Bildungsbürgertum* itself was not free of ethnic prejudices, and a beleaguered liberalism brought them out. Emily Exner's nostalgia for the liberal era had anti-Semitic overtones and reflected a new proto-fascist *Heimat* discourse. Still, her anti-Semitism remained contained. The second generation of Exners began their careers during the late liberal era, the short period in the history of Austrian liberalism when the political union of all Germans was not on the agenda and when the hegemony of the Austrian idea and the cultural definition of *Deutschtum* were not in question. They reached the peak of their careers, and their children came of age, when resurging German nationalism brought the old liberalism under attack. This helps account for the parents' moderate nationalism and defensive liberalism as opposed to the children's militant nationalism. It also explains why, for Brunnwinkl to serve as a liberal utopia, Coen must present it as reflecting the old liberalism, short in its duration and by no means typical, in its moderate nationalism, of Austrian liberalism.

The liberal inheritance became transformed in odd ways. The transmutation of the Exners' scientific discourse from the second to the third generation suggests how the children tweaked the parents' liberalism to convey nationalism and racism. Sigmund Exner researched the interaction between environment and inheritance. Already before World War I, Karl von Frisch's study of the language of bees suggested the primacy of communal inheritance and highlighted the territorial and cultural struggle between German and Italian stocks. He was imagining ethnic warfare in nature and advancing German claims. Robert and Franz Exner's interwar psychology and criminology, both using extensively racial categories and racist stereotypes, could be read as pushing further Sigmund's research on inherited psychological abilities. Yet, as Coen emphasizes, Sigmund's physiology was universalist, individualist, and probabilist, leaving room for self-cultivation, education, and human action, whereas his nephews' work was racist, collectivist, and relativist. Parents and children were politically worlds apart.

The problem was less the vulnerability of liberal scientific discourse to fascism and more the radical change in political circumstances. No discourse is immune to political perversion, and cultural constructionism would not have

saved Sigmund's physiology from his nephews' abuse. As Robert and Franz were developing their psychology and criminology, Austria became a radically different place, a small nation state that no one wanted, rump of the empire, torn by cultural and political warfare between Catholics and socialists, the provinces and Red Vienna. Their parents' liberalism vanished together with the *Bildungsbürgertum*. The majority of their countrymen were eager for German unification. For avowed secularists, the socialists and Pan-Germans were the political alternatives. Both supported a Great Germany, the socialists holding up the 1848 vision of a democratic Germany—the liberal inheritance—the Pan-Germans counterposing an ethnocentric vision. Felix Exner, director of Vienna's Central Institute for Meteorology, apparently opted for the socialists. Given their class and academic background, it is not surprising that some of his cousins appear to have opted otherwise.

In interwar Austria, racial discourse cut across the political spectrum, and so did anti-Semitism. The Pan-Germans excelled in joining together nation, race, and anti-Semitism, surpassed only by the Nazis, and the socialists disentangled the three, neutralizing their worst effects. But, like the Exners, the socialists endeavored to make inroads into the provinces by accommodating *Heimat* discourse, futilely striving to convert proto-fascist local patriotism into democratic nationalism. As part of a "national climate" project, Felix Exner delivered in 1926 a university lecture on the Alps' climatic contribution to Europe. A year later, city councillor Eduard Bürger led a seminar on the *Heimat* idea at the Vienna Pedagogical Institute. A young socialist, Karl Popper, criticized the educational limits and political dangers of *Heimat*, eliciting Bürger's mild rebuke.²³ For all his love of nature and Alpine summers, Popper recognized the fascist pedigree of *Heimat* and would have none of socialist efforts to appropriate it. He was challenging a hegemonic discourse.

Coen seeks to rescue the Exners' liberal legacy from the Nazi children. "They took charge of the Exners' legacy," she says, "but the historian need not leave it in their hands" (348). She is right but she cannot recover the liberal utopia by relegating the third generation of Exners to an aberration. Ironically, and tragically, in the history of Austrian liberalism, the liberal parents' mild nationalism appears anomalous and the children's racism mainstream discourse for their time. Coen's Exners permit us insight into the German nationalist syndrome of Austrian liberalism, and the beginning of an effort to decipher the tragic riddle of its transmutation and demise.

²³ Karl Popper, "Zur Philosophie des Heimatgedankens" (1927; on the philosophy of the *Heimat* idea), in *Frühe Schriften, Gesammelte Werke in deutscher Sprache*, ed. Troels Eggers Hansen, vol. 1 (Tübingen: Mohr Siebeck, 2006), 10–26.

THE EXNERS' LEGACY: LIBERALISM AND THE SCIENTIFIC IMAGINATION

“Here stands the tree: many individual leaves may fall from it, but its foundation and its structure are solid and fine. It will always sprout new branches and new leaves will always fall; [but] it itself will never fall” (189). The Exners used Fechner’s ever-living family tree (*Stammbaum*) to express their hopes for their family. Coen, seeing the hopes as emblematic of Viennese liberalism and its scientific culture, keeps them alive by turning the Exners into an inimitable model. Yet, in reality, the Exners’ world fell apart, empire, family, and all, and Viennese scientific culture remained alive first and foremost among the Austrian émigrés. Can one still speak of “inheritance” after 1918, 1938, and the unspeakable horror that followed?

The socialists claimed the liberal legacy. Already around the turn of the century, socialists and liberals began collaborating on cultural questions such as school reform and popular education (*Volksbildung*), and constituted a united anticlerical front. The Viennese progressives provided a bridge between the liberals and socialists. Most were younger and less established than the Exner parents, heavily but not exclusively Jewish, open to democracy, supportive of economic planning and social legislation.²⁴ They shared with the socialists a belief in the blessings of scientific culture, and the building of municipal socialism in interwar Red Vienna proved a solid terrain for their collaboration. As the socialists also avowed liberal democratic nationalism, they could have hoped to make inroads into the middle classes. But the fears evoked by the Bolshevik Revolution, reinforced by the socialists’ Marxist rhetoric, made class divisions pivotal. The socialists had to retain the liberal legacy without the liberal constituency.

There were limits to the socialists’ inheritance of the liberal legacy. Austria’s political culture remained illiberal. Secure in their family, intellectual circles, and lecterns—in “Brunnwinkl”—the Exners introduced uncertainty into scientific culture. Uncertainty implies suspension of belief and openness and, if extended beyond intimate groups, can contribute to liberal politics. This did not happen. Interwar Austria was a battlefield with a raging civil war, cold for long intervals, hot and bloody on numerous occasions. The permanent state of emergency (*Ausnahmezustand*) allowed no uncertainty or openness. Marxism reinforced the socialists’ embattled political culture. The public sphere existed by default, a result

²⁴ Ingrid Belke, *Die sozialreformerischen Ideen von Joseph Popper-Lynkeus (1838–1921) in Zusammenhang mit allgemeinen Reformbestrebungen des Wiener Bürgertums um die Jahrhundertwende* (Tübingen: Mohr, 1978), 5–56; Albert Fuchs, *Geistige Strömungen in Österreich, 1867–1918* (Vienna: Löcker, 1949), 133–62.

of truce among the warring camps, independent newspapers and intellectual circles, and, for a while, constitutional protections. The *Anschluss* put a rude ending to whatever public sphere remained by 1938. In the postwar years the “social partnership” of Catholics and socialists, determined not to repeat interwar mistakes, negotiated differences on the corporative level, precisely so they would not become publicly contentious. The silence imposed on the great open secret—Austrian collusion in Nazi crimes—became emblematic of an entire political culture. Austria did not develop a liberal political culture until well into the post-World War II era.

Liberal scientific culture fared better. Serafin Exner’s students all obtained chairs in experimental physics in Austria and had formidable international reputation. In Red Vienna the reach of scientific education expanded, albeit not as much as the socialists had hoped. The Vienna Circle, too, retained the Exner legacy, and, like the physicists, had an international reach, with an organizational network in central Europe’s urban centers and disciples throughout Europe and North America. The circle internalized the Exners’ probabilistic universe and radicalized uncertainty. “Philosophical absolutism” and “metaphysics” became pejoratives, marks of unscientific philosophy. Science grasped at a modicum of order in the universe but made no metaphysical assumption about it. “Objectivity” and rationality became serious problems, as they never were for the Exners, and the ability to retain them against “subjectivism” (Heisenberg) and romantic irrationalism a measure of a philosopher’s success. Coen highlights the differences between the Exners’ humanistic liberal *Wissenschaft* and progressive–socialist technocratic science, between *Bildung* and the Vienna Circle’s scientific world view (*wissenschaftliche Weltauffassung*). She is right, but the differences can also be exaggerated. The socialists have been criticized for haplessly trying to impose humanistic education on the workers, with libraries on every Viennese corner displaying Kant and Goethe.²⁵ Many Vienna Circle members had also humanistic interests. The socialists adjusted the liberal legacy to democracy and the Vienna Circle tweaked it to radical uncertainty.

At the end, liberal scientific culture was more successful than liberal politics because it could go into exile. Serafin Exner’s students had, unlike his nephews, an anti-Nazi profile: a majority was dismissed in 1938 and a good number, counting two Nobel laureates (Victor Hess and Erwin Schrödinger), emigrated. (So much for libeling natural-science thinking as incipiently fascist.) The Vienna Circle’s annual congresses for scientific philosophy, begun in 1935 in Paris, solidified British and American interest in scientific philosophy and facilitated the migration of the circle’s members. Within a few years, most of them had left

²⁵ Helmut Gruber, *Red Vienna: Experiments in Working-Class Culture, 1919–1934* (New York: Oxford University Press, 1991).

central Europe. The Viennese diaspora inherited the Exners' family science and spread it internationally.

This international community gave rise to a compelling reformulation of liberal ideals in Popper's philosophy. For Popper, a heterodox Viennese socialist laboring on the outskirts of the Vienna Circle, the scientific networks of interwar central Europe and the Viennese diaspora provided a model for the restoration of liberal democratic politics. The Exner circle—a closely knit “family science”—would have had no place for a fiercely independent maverick, defying the rules of academic patronage. But the Vienna Circle's network did, if only with difficulty. By modeling the scientific community on democratic ideals, Popper accentuated the communal features that gave him admission: openness, equal access, and public criticism. Uncertainty, too, became a central tenet, in the form of non-foundationalism: “Science does not rest on a rockbed. Its towering edifice . . . rises over a swamp. The foundations . . . do not reach a natural base, but . . . one resolves to be satisfied with their firmness, hoping they will carry the structure.”²⁶ Democracy, in turn, mimicked science and was liberal. Protection of civil rights was founded in recognition that no one had monopoly on truth and all arguments had to be heard. Majorities needed to be restrained. Western democracies, providing refuge for the émigrés, approximated the scientific ideal. Fascism destroyed liberal science and politics in central Europe. Popper responded in his New Zealand exile by reshaping them as free cosmopolitan communities, engaged in critical debate. Imagining the Viennese diaspora as a commonwealth, he created the open society.

Coen contrasts the Exner scientific dynasty with the democratic public, and liberal science with Popper's public criticism. “Most of the social groups of a modern open society . . . do not provide for a common life,” she quotes Popper, “with the exception of some lucky family groups” (352).²⁷ The “lucky family,” a patrician mini public sphere, had lost its place in Austrian politics by the interwar years. Popper needed to reconstruct the public sphere from scratch—for democracy. Coen sympathizes with liberal science and implies that democratic “publics” represented no progress. Anchoring liberal science in domestic life and ignoring the cosmopolitan character of Popper's democratic public, she undercuts the major links tying liberalism and democracy, nineteenth- and twentieth-century philosophy of science—their progressivism

²⁶ Karl Popper, *Die beiden Grundprobleme der Erkenntnistheorie* (1930–33) (Tübingen: Mohr, 1979), 136; revised as *Logik der Forschung: Zur Erkenntnistheorie moderner Naturwissenschaft* (Vienna: Julius Springer, 1935), 66–7; translated into English as *The Logic of Scientific Discovery*, trans. Karl Popper (London: Hutchinson, 1959).

²⁷ Karl Popper, *The Open Society*, American edn (Princeton, NJ: Princeton University Press, 1950), 170.

and internationalism. This diminishes the Exners' legacy. The Exners saw a populist mob in every democratic public, so Coen refuses to recognize democratic appropriations as fulfilling the liberal promise. She has no way of reclaiming the liberal legacy from the Nazi Exners and falls back on their nostalgia for the old order. Truly, the Exners remain instructive because Popper and his generation took liberalism over from patrician families and reworked it to confront the challenges of democracy and uncertainty.

Historicizing the Exners as "family science," Coen also does not fully see her own accomplishment in creating an Austrian history *de longue durée* to illuminate twentieth-century philosophy of science. From Franz Exner's gymnasium reforms in the 1850s to medical school reform in the 1880s to *fin de siècle* fights over religious instruction in the *Freie Schule* to the *Horte* (childcare centers) and *Kinderfreundeschule* in socialist interwar Vienna, science, educational reform and politics were continuously and inextricably linked. Coen highlights the connections between psychology, philosophy, natural science, and educational reform, creating an Austrian philosophy that periodically opens up to German influences, but has an identity of its own. Popper's critical rationalism appears as the radicalization of a long Austrian pedigree of uncertainty. Two of his intellectual feats become clear against the Austrian background Coen draws: he disentangled the century-long Exner equation of empiricism and skepticism, idealism and absolutism, by reshaping Kantian skepticism; and he married democratic politics, often associated with predictability and immutability, with liberal uncertainty. We do not know, he said, there is no way ever to be certain, and this must become a basic ethical, educational, and political guideline. Otto Neurath's 1929 construction of an anti-German, anti-idealist Austrian philosophy and efforts today to reclaim Popper as an Austrian philosopher, which may seem opportunistic, now appear historically well reasoned. Coen provides the signposts for an Austrian philosophy that shaped influential intellectual currents of the twentieth century, and the Exners play a central role in its formation.

Coen's enchantment with Brunnwinkl also prevents her from tracking the Exners' legacy. Against the background of Weber's disenchanting science and Popper's ruthless public criticism, Brunnwinkl's charm seems obvious. For, theoretically unimpeachable though critical rationalism may be, it confronts sociological and psychological obstacles. Critical communities are not happy ones, and not always the most creative. Coen, a young scholar in an academy where professionalism obliterated intimacy without eliminating arbitrariness, craves Brunnwinkl's "public domestic science," the conjunction of family, community, and university. In Brunnwinkl, the family "mediates between solitude and companionship," relatives are research collaborators, scientists and poets dwell together, and the scientist is also a poet. Family bridges intimacy and distance

(objectivity), diversity and community, private and public, city and wildlife. Play and learning, village and academic life, urbanity and nature all join together in colorful harmony. Science fashions the self, “trains the senses and the communicative faculties” and “mediates between interiority and intimacy” (23). The Exners made extraordinary claims for science and the family. Coen badly wants Brunnwinkl to be true and vindicates their claims.

Colluding in the Exners’ mythmaking, Coen creates an indomitable picture of their liberalism. The coherence of their probabilistic universe—liberal politics, science, and family all conveying, like Brunnwinkl, a balance of spontaneity and order—is unreal. The coherence is as much a product of Coen’s metaphorical imagination, which discovers the liberal family and the Alpine landscape in molecular relations observed through the microscope’s lenses, as it is of liberal discourse. Her discussions of the intellectual context for indeterminism, of the research field and its theoretical challenges, lead back to politics and family only through her metaphorical intervention. Even after Coen observes that the Exners no longer felt assured of a public afterlife, she joins together diverse liberal practices and discourses about inheritance—personal, political, legal, psychological (memorization), and biological—creating the impression of liberal success, whereas liberal inheritance failed miserably, and was saved mostly by socialists and émigrés. Brunnwinkl embodies the whole life, the totality craved by romantics. Through liberal nostalgia, product of a crisis, Coen projects a coherent liberal ideology. Nostalgia’s less palatable aspects—the proto-fascist, anti-urban, anti-Semitic *Heimat* discourse—Coen forgives. The Exners’ liberalism is too good to be true.

Coen has created a liberal utopia. This utopia is remarkable for restoring dignity to nineteenth-century Austrian liberalism against the major tenor of contemporary scholarship. Schorske was kind to the patrician liberals but their liberalism seemed doomed and his cultural heroes were all on the modernist side. For Coen, the Exners’ liberalism is vital: “The version of rationalism they were defending was as self-consciously antidogmatic as it was hostile to the undisciplined subjectivity they saw in Klimt’s mural” (212). Against Rossbacher’s dark picture of patrician families, Coen counterposes Brunnwinkl, suggesting that the Exners were different. Against Beller’s predominantly Jewish Viennese liberalism, she portrays a largely non-Jewish liberal culture. Against Boyer’s pinning of the Austrian culture wars on liberal anticlericalism, she suggests that it was the Christian Socials who started the war, and that the Exners were defending academic freedom. Against Judson’s liberal ethnonationalists, she counterposes Franz Serafin Exner, opposing mobilization for World War I. Against my own marveling at the Viennese progressives, she suggests that their scientism entailed a loss of *Bildung*, of the humanist dimension of science. Her sense of loss of liberal culture, however nostalgic, is touching. Unlike Popper’s open society,

“Brunnwinkl” looks backward to the patrician past rather than forward to the democratic future, unusually for liberalism. But Coen senses something real and important about the lacunae of contemporary academic culture. Envisioning a patrician liberal utopia is her response.

Coen does not recognize how audacious her liberal utopia and intervention in the field are. She is kind to every historian but Schorske, whose narrative is closest to her and whom she vindicates, despite herself. No one, since Schorske, has treated patrician liberalism with greater compassion and respect. Austrian scholarship has never lost interest in the *Großbürgertum* and, liberalism being irrelevant politically in Austria, has not targeted liberalism for critique either. US scholars, in contrast, have lost interest in the Viennese patricians but poured criticism on liberalism, in whatever form, in Austria and elsewhere. Even my own rehabilitation of Popper underwrote his liberalism as progressive socialism. I never imagined that conservative liberalism, antidemocratic, would become a model to emulate. Indeed, it would be near impossible for a historian of my generation, only fifteen years older than Coen. It is not a coincidence that a younger historian forged a patrician liberal utopia. The historical profession and the academy are once again going through a generational change. For those who have always felt more comfortable with Schorske and his liberals than with their own generation, Coen’s book is a welcomed surprise. Schorske has recently received the Austrian Victor Adler State Prize, honoring his life work (and suggesting whom the Austrians regard as inheritors of the liberal legacy).²⁸ Coen’s book has received the Susan E. Abrams Prize in History of Science from the University of Chicago Press. They deserve congratulations together.

²⁸ Victor Adler (1852–1918) was the leader of Austrian Social Democracy.