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The Rise of Postmodernisms and the “End of Science”

Gerald Holton

In Isaiah Berlin's remarkable essay, "The Apotheosis of the Romantic Will,"¹ he leads up to a key question facing contemporary historians of ideas. He begins with the observation that beliefs have entered our culture that "draw their plausibility" from a deep and radical revolt against the central tradition of Western thought. That central tradition rested on the "pillars of the social optimism," which had found its fullest expression in the Enlightenment, "that the central problems of men are, in the end, the same throughout history; that they are in principle solvable; and that the solutions form a harmonious whole."

But Isaiah Berlin notes that these pillars "came under attack toward the end of the eighteenth century by a movement first known in Germany as *Sturm und Drang*, and later in the many varieties of romanticism...and the many contemporary forms of irrationalism of both the right and the left, familiar to everyone today." In our time, in the alleged absence of "objective rules," the new rules are those made up by the rebels: "Ends are not...objective values," and "ends are not discovered at all but made, not found but created." And he concludes: "The prophets of the nineteenth century predicted many things...but what none of them, so far as I know, predicted was that the last third of the twentieth century would be dominated by...the enthronement of the will of individuals or classes, and the rejection of reason and order as being prison houses of the spirit. *How*

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¹In Isaiah Berlin, *The Crooked Timber of Humanity: Chapters in the History of Ideas*, ed. Henry Hardy (NY: Vintage Books, 1992).

*did this begin?"*² As if to ensure that this question be considered central to the understanding of our age, he adds that the explosion of irrationalism is one of the "outstanding characteristics of our century, the most demanding of explanation and analysis."³ Elsewhere he also appeals to seek the causes of "what appears to me to be the greatest transformation of Western consciousness, certainly in our time."⁴

Focusing my presentation chiefly on the aspects concerning science, one may well rephrase Berlin's question: How did it come about that, in the phrase coined by the philosopher Susan Haack, we have passed again in many areas into an "Age of Preposterism?"⁵; that, for example, scientists, who are now in a period of spectacular advances of knowledge across the board, find a whole array of highly placed academics and journalists asserting that scientists' hopes to reach objective truths--two highly suspect words now--are in vain because there is no difference between the laws scientists find in nature and the arbitrary rules that govern baseball games; that science is "just one language game among others"; that we must "abolish the distinction between science and fiction"; that "The natural world has a small or non-existent role in the construction of scientific knowledge"; and in any case, as the title of a current bestseller has it, we are at *The End of Science: Facing the Limits of Knowledge in the Twilight of the Scientific Age*.⁶

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²Ibid, p. 208-13,

³Ibid, p. 1.

⁴Isaiah Berlin, *The Roots of Romanticism* (Princeton: Princeton University Press, 1999), p. 20.

⁵Cf. her books *Manifesto of a Passionate Moderate* (Chicago: University of Chicago Press, 1998), and *Defending Science—Within Reason: Between Scientism and Cynicism* (Amherst, NY: Prometheus Books, 2003).

⁶For documentation and examples, see chap. 6 in G. Holton, *Science and Anti-Science* (Cambridge: Harvard University Press, 1993); chap. 1 in G. Holton, *Einstein, History, and Other Passions: The Rebellion Against Science at the End of the Twentieth Century* (Cambridge: Harvard University Press, 2000); Perry Anderson, *The Origins of Postmodernity* (London, New York: Verso, 1998); Alan Sokal and Jean Bricmont, *Fashionable Nonsense: Postmodern Philosophers' Abuse of Science* (New York: Picador,

These are only a few glimpses, indicators of a stream of derogations, issuing from academe and the media. But happily, my concern here is not with the details of the current manifestation of what has been called the war on science, but rather with examples of its historic lineage, with earlier phases of what Isaiah Berlin called the "Romantic Revolt."⁷ Here we must begin our analysis by recognizing that any such movement as Isaiah Berlin identified is best understood as a reaction against what went before, a reaction against what became so unsatisfactory or even intolerable as to cause the revolt.

[Editor: keep break]

Historically, the most obvious and early reaction of this sort was the response to the breakthroughs in the seventeenth century that formed science and simultaneously signaled the great rupture from the ancient worldview, one in which the individual, in principle, had been able to be both intellectually *and* spiritually comfortable. As one of the direct ancestors of romanticism, Johann Gottfried Herder (1744-1803), put it, premoderns could still understand and grasp "the solid order of nature, and they lived safely within it"⁸; but after the rise of modern science, in the words of Jean Paul Richter, mankind found itself lost in a mechanistic solar system, that "all-powerful, blind, lonesome machine."

Each field has its own date for the onset of its offensive modernity. For science, the plausible date when "human character changed" is not, as Virginia Woolf put it, "in or

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1998); Noretta Koertge, ed. *A House Built on Sand: Exposing Postmodernist Myths about Science* (Oxford, New York: Oxford University Press, 1998), and Steven Weinberg, *Facing Up: Science and its Cultural Adversaries* (Cambridge: Harvard University Press, 2001).

⁷Berlin, Ref. 1, p. 229.

⁸Quoted in Alexander Gode-von Aesch, *Natural Science in German Romanticism* (New York: Columbia University Press, 1941), p. 51.

about December 1910," but February 1605, when Johannes Kepler, while working on his *Astronomia Nova*, laid out his breathtaking ambition in a letter to his friend, Herwart von Hohenburg: "I am much occupied with the investigation of the physical causes [of the motions of the solar system]. My aim in this is to show that the celestial machine is to be likened not to a divine organism, but rather to a clockwork..., insofar as nearly all the manifold movements are carried out by means of a single, quite simple...force, as in the case of a clockwork [all motions are caused] by a simple weight. Moreover, I shall show how this physical conception is to be presented through calculation and geometry."

Soon, this approach, hugely successful on its own terms, was regarded by one side as triumphs of reason and experiment, but by the other as deeply felt assaults on the previous sources of mankind's stature and self-confidence--as culture shock and epistemic trauma, to use modern argot. The list of indictments was long: Galileo's completion of the de-centering of the human abode in January 1610, when his telescope revealed the existence of moons around Jupiter, thereby launching mankind, with reduced significance, into the unbound Copernican void, and causing John Donne's anguished outburst of 1611, "Tis all in peeces, all cohaerence gone"; the elevation of the quantitative in nature over the qualitative; the objective and skeptical over the subjective and mystical; the separation of the natural from the supernatural; the validation of rational over intuitive discourse; the "disenchantment of Nature" (in Max Weber's term), partly by turning away from the ancient fascination with individual, wondrous, portentous instances, and toward the search for general and overarching laws; from individual belief to sharable results; the downgrading of the contemplative relation with nature, in favor of active intervention; and above all the mechanization of the model of the universe in Isaac Newton's published writings--if one neglects the few passages in them which hinted that Newton was no Newtonian but rather privately a life-long searcher for the nature of the divinity. Of course, the change of the predominant worldview was slow and complex, with seemingly contradictory strains co-existing for a

long time (as scholars such as Alexandre Koyré, E. A. Burt, and Hélène Metzger pointed out long ago). But appropriately, the word *modernity* and its cognates entered the English language starting as early as the 1620s. As the romantic dramatist Heinrich von Kleist put it later: "Paradise is now bolted and barred."

More elements of modernism followed--the postulation of the mind-body dualism, the findings of evolutionism, some of the tenets of psychoanalysis, each adding to the de-divinization of man and Nature, which Friedrich Schiller had called the *Entgötterung der Natur*. As Koyré remarked: "The mighty, energetic God of Newton who actually 'ran' the universe according to His free will and decision, became, in quick succession, a conservative power, an *intelligentia supra-mundana*, a '*Dieu fainéant*'....The infinite Universe of the New Cosmology...inherited all the ontological attributes of Divinity. Yet only those--all the others the departed God took away with Him."⁹

During the last two centuries, it has seemed to many that science became ever more arcane, and technology a blind juggernaut. Some overreaching remarks by scientists, from Laplace to Wilhelm Ostwald to Stephen Hawking, did not help either. But all the deeds and misdeeds charged against the mindset of the Enlightenment, all the excesses of the project of modernity and its inherent practical and psychological incompleteness, must be understood with sympathy. They served periodically to coalesce a critical mass of strenuous objectors of a great variety, from the clergy under Pope Urban VIII in the days of Galileo, to the brilliant poets, Keats, Byron, Shelly and Blake (William Blake especially, who regarded Newton as his personal Satan); from the mystic Jacob Böhme to a recent lecturer who, to great applause, called for the "return to the Holy Darkness." Thus, the periodic rebellions against the worldview evolving from the rise of modern science--itself to a high degree the child of a reaction in the seventeenth century

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⁹Alexandre Koyré, *From the Closed World to the Infinite Universe* (New York: Harper & Brothers, 1958), p. 276.

against the canon of the ancients--must be understood as episodic up-wellings of a bipolar sentiment deeply rooted in the human psyche: one part an aching mourning for a glamorized version of the earlier state of humanity, the other part a desperate longing for a utopian restitution, in new form, of what had been lost. Throughout history, such passionate sentiment may dominate for a few decades, even inspire immortal works by philosophers, poets, composers, and artists, and then may largely subside in the face of a slowly rising opposition to its excesses--yet leaving a continuing undercurrent which, on the personal scale, each individual may feel, but which, on a large scale, prepares for the next rise, the next phase of the Romantic Rebellion.

To illustrate the context and variety of these major outbreaks over the past two centuries I select here from many worthy examples two works that focus on the intellectual rather than the social factors of the Romantic Rebellion. Furthermore, to signal the widely *differing* aspects of the phenomenon we are discussing here, I have chosen one that was relatively benign, and one that was diabolically destructive. But both have left traces in today's still different versions of the Romantic Rebellion.

The first example is the ascent of *Naturphilosophie*, prominent for a few decades at the beginning of the 19th century. One of its main sources is, perhaps surprisingly, a majestic figure in the history of ideas who arguably presents both an admirer of the seventeenth-century scientific revolution, and, at the same time, through idiosyncratic readings of his work, was used for a rebellion against it. I speak of Immanuel Kant of Königsberg (1724-1804), that veritable mountain from which different streams of thought descended, like one of those peaks on the Continental Divide which gives birth to rivulets that diverge, grow, and eventually end up in different oceans.

Kant's deep interest in Newtonian science had started in his student years. At age 31, he published his "Universal Natural History and Theory of the Heavens," with a subtitle ending with the words "Treated according to Newtonian Principles." It is full of

remarkable anticipations of subsequent cosmological findings and theories. But importantly--unlike the Newtonians who followed only Newton's mechanistic *Principia* and *Opticks*-- in the early Kant, God still directs Nature after having created space, time, matter, and the laws of Nature. But in the *Critique of Pure Reason* of 1781, he despaired of providing a proof for the existence of God, although he left the door open, by denying that there ever could be a *disproof* of His existence--a point of major importance to his later pietistic followers. Also, in the *Critique of Pure Reason*, space and time became conditions of human knowledge based in Categories, in intuitions pre-existing in every mind. Thus he launched his transcendental idealism, in which the form of experience is supplied by the human mind while the real material world outside the human self is the source of experience that comes to us through sensations. The later idealists, who believed themselves to follow Kant, went much further. Thus, Friedrich Wilhelm Schelling would hold that there was no need to dirty one's hands with experiments.

Five years after his first *Critique* came Kant's *Metaphysical Foundations of Natural Science*. In it, a point essential for our purposes, is Kant's view that "motive forces," of only two kinds, attraction and repulsion, are providing the fundamental attributes of matter. This theme of two opposing forces determining all natural phenomena had already preoccupied the alchemists and the sixteenth-century iatrochemists such as Paracelsus and van Helmont. As elaborated by Kant, the polarity of forces masks a "hidden [*versteckte*] identity," which allows one to hypothesize a unity, a "*Grundkraft*," a fundamental force of which all other forces are variants. We recognize here a thematic line that goes back to Thales of the Ionians, who looked for one substance or essence to explain all phenomena of the material world, and forward to the attempts of our contemporary physicists to unify all four main forces of nature into one. The old Ionian Enchantment, active at the very beginning of science, also infected Kant, for whom Unity was the first of all his Categories; and, as we shall see, it also inspired those who regarded themselves as his pupils.

To those, Immanuel Kant provided the well-springs from which issued two contrary main directions of thought. One is exemplified in the later scientific work of major scientists such as Hermann Helmholtz, Emil Du Bois-Reymond, and Rudolf Virchow, successor to the Newtonian synthesis who embraced the experimental contact with nature and the interest in Newtonian science, which had all been part of Kant's thought. But on the other side, Kant could be read, or misread (as Friedrich Schlegel did) as the father of a very different, new view of science, one infused with the Romanticism of the "Nature Philosophers."

Those *Naturphilosophen* were numerous enough to create a critical mass that sent their ideas exploding into the intellectual life of the period. They included Friedrich Schelling, philosopher, friend of Hegel; the brothers F. and A. W. Schlegel; Novalis; Goethe; and all their influential followers. Schelling shared with most of his friends the view that nature is an organism rather than a mechanism, that the world contains a single *Urkraft* which, thanks to its inherent polarity, produces a conflict between its diverse exemplifications in nature; that matter, contrary to Newtonian physics, was never inert, but was alive and subject to a conflict that explained growth, decay, and chemical reactions. In opposition to the rationalism favored by the Enlightenment, Schelling's books such as *Philosophie der Natur* (1797) celebrated intuition, and he founded two journals on so-called "Speculative Physics."

Johann Wilhelm Ritter, chemist, physicist, physiologist, a tragic and unruly figure, though a prolific experimenter, dabbled in occultism, and like many others in this group believed in a World Soul animating nature, causing all phenomena to be interdependent and unified. Lorenz Oken, natural scientist and philosopher, also supported an enthusiastic romanticism through his concept of *Ur-man*, and the evolution of all life forms from a primal slime. And Christian Weiss, with fundamental contributions to crystallography, was deeply influenced by Kant, by Schelling, and by the philosopher Johann Gottlieb Fichte. Fichte's book, *Wissenschaftslehre* (1794),

powerfully infused the Romantic movement with his idea of the primacy of the individual ego, the freedom from objective rules, and the construction of value by the creative human self rather than being based on the historic canons.

Despite many differences, these men had much in common. L. Pearce Williams has pointed out¹⁰ that they all were born within a span of eight years in the 1770s, the decade that launched, first in literature, the period known after the play *Sturm und Drang* by F. M. Klinger, 1777. They grew up in the aftermath of the Terror and the disintegration of Revolutionary France, and recoiling from it came to believe that "without God, there could be no social order." They gave free run to their emotions in their writings, often taking excessive risks, as well as being open to the arts and especially to literature. As Williams put it, "All felt the near ecstasy of creativity springing from the active mind. Spirit was as real to them as body. All underwent youthful crises, and discovered Kant as the answer to their personal angst." Kant's loophole for the existence of God (by the impossibility of the disproof of His existence) was, as they read it, a liberation that gave a place to the highest intelligence in nature, as well as freedom for rampant speculation in science--precisely a point to which Kant would have objected strongly.

[Editor: keep space]

Even these necessarily fragmentary characterizations I have given here indicate persistent themes parallel to some ideas espoused in the current phase of the Romantic movement. But there are also fundamental differences. The most obvious one is that almost every Nature Philosopher of the eighteenth and the first part of the nineteenth century had, from their perspective, an intense and honorable interest in scientific

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¹⁰L. Pearce Williams, "Kant, 'Naturphilosophie' and Scientific Method," in *Foundations of Scientific Method: The Nineteenth Century*, eds. R. N. Giere and R. S. Westfall (Bloomington: Indiana University Press, 1973).

matters, even if non-Romantic scientists such as Jöns Jacob Berzelius and Justus von Liebig would have none of it. Liebig famously cried out: "the activities of the *Naturphilosophen* are the pestilence, the black death of the century." But most scientifically inclined Nature Philosophers tried to, and some did, contribute to science in their way. For example, after William Herschel discovered invisible infrared light at one end of the spectrum, Johann Wilhelm Ritter discovered invisible ultraviolet light to exist at the other end, reasoning entirely from the Romantic penchant for analogy and polarity. And there was one who ironically did stumble on a most fundamental scientific advance by a fanciful interpretation of Kant's ideas. It is a case worth lingering on for a moment. This man, for whom I have a special fondness, was the Danish scientist Hans Christian Ørsted--a typical Romantic, in his incessant attempts to re-enchant nature by endowing her with *Geist* or spirit, as in his book *The Soul in Nature*--in his pietism, even in his effusion into poetry.¹¹

He made room in his own research for speculation and intuition, and for what he called, in the happy phrase, the willingness to allow the scientific imagination to be guided by an "anticipating consonance with Nature." But on the other hand, arguing that the human mind reflects Divine reason only very dimly, he knew he also had to subject those intuitions eventually to *experiment*. And that he did, preserving in that respect a continuity with the Newtonians, despite the ideological differences and mutual disdain between these two worldviews. He studied in Berlin for a time under Fichte and the brothers Schlegel, but his idiosyncratic reading of Immanuel Kant was Ørsted's main guide from the beginning. Ørsted's doctoral thesis in philosophy of 1799 was on the

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¹¹Most of Ørsted's scientific papers, with useful introductions, are available in Kristine Meyer, ed. *H. C. Ørsted's Scientific Papers* (3 vols.) (Copenhagen: Andr. Fred. Høst & Søn:1920), in the recent, very useful work, *Selected Scientific Works of Hans Christian Ørsted*, eds. Karen Jelved, Andrew D. Jackson, and Ole Knudsen (Princeton: Princeton University Press, 1998), and in *H. C. Ørsted and the Romantic Legacy*, eds. Robert Brain and Ole Knudsen (Dordrecht: Kluwer, in press).

"Metaphysics of External Nature," a recasting and extension of the book *Metaphysischen Anfangsgründe* published by the man whom Ørsted called, at the very beginning of the treatise, "the immortal Kant."¹²

But Ørsted also accepted Schelling's *interpretation* of Kant, that nature's phenomena were to be explained by a "conflict" between opposing exemplifications of the unitary force that sustained matter itself. So in an essay¹³ Ørsted published in 1805 at age 28, he announced that electricity and magnetism--then regarded as completely different and unrelated forces by all mainstream scientists in Europe--were, on the contrary, related "dynamic processes," explainable as "the interaction of opposite fundamental forces in a different form." Seven years later he explicitly used Kantian ideas of the one basic force underlying its polar exemplifications to explain that under different circumstances these should take the form of electricity, magnetism, heat, light and chemical reactions, depending on the experimental conditions.

It took until one evening in April 1820 for Ørsted to get around to first actually testing his fervently held ideas by experiment. He expected that in a thin wire the electric current, considered to be inherently a conflict of opposing parts, would reveal a magnetic field. The theory was entirely wrong. But his demonstration of the actual production of magnetism by an electric current succeeded,¹⁴ and was Ørsted's passport to immortality. This synthesis set in motion the eventual elaboration of the theory through Ampère, Faraday, and Maxwell, as well the invention of electro-magnetic devices, from telegraphy, motors and generators, telephony, and much else that is at the heart of the products of modern industry. Thus, ironically, in tracing its ancestry, modern science and technology can discover a *Naturphilosoph* among their forbears.

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¹²Jelved *et al.*, *op cit.*, p. 80.

¹³*Ibid.*, chap. 19, "New Investigations into the Question: What is Chemistry?" .

¹⁴Meyer, *op. cit.*, vol. II, 214-18. See also *ibid.*, 223-45 and 351-98. There is a large amount of excellent scholarly secondary literature on this discovery.

Needless to say, Ørsted's achievement had two very different, may I say conflicting, effects in the history of ideas. To the Nature Philosophers, it was proof, if proof they needed, of the correctness of their basic idea that nature was, contrary to Kepler, one coherent organism, a dynamic, pulsating playground of the basic force in its various guises, and infused by spirit. But on the other hand, Ørsted's achievement in physics was soon reinterpreted and understood in terms of the field physics of Faraday, Maxwell, Helmholtz, Hertz and others, all working in the Newtonian, even mechanistic tradition. Their triumphs helped put an end to the stranglehold which Nature Philosophy and the Romantic Rebellion had held on much of the European imagination for a few decades. The great wave of Romantic science and philosophy submerged, at least for a time (with some parts of it playing itself out again in the fights around Darwinism later in the century).

[Editor: keep space]

In the twentieth century and since, there was one sequel after another, and this brings me to my second, far darker example of the periodic ascent of the Romantic Rebellion against well established scientific ideas and methods. The new flight from reason and from the old order began to appear in such works as Oswald Spengler's apocalyptic book *The Decline of the West* (1918), in which soul-less science was singled out as a cancer marking the inevitable, early end of our civilization and of science with it, thus preparing for the takeover of a new form of culture. In 1922, the great scholar of theology, Adolf von Harnack, spoke for many concerned intellectuals who saw and feared the trend: "Throughout the European world of culture of today there swells up again an international Romantic wave....Instead of science and scholarship, one calls for 'Life' and for 'Intuition' instead of reason."¹⁵

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¹⁵Adolf v. Harnack, *Erforschtes und Erlebtes* (Giessen: Alfred Töpelmann Verlag, 1923), p. 344.

Spengler's book, for example, had all the earmarks of the revolt, in its outrageous speculations, its exciting predictions, its distaste for all that the Enlightenment ideals represented.¹⁶ Not surprisingly, most influential thinkers rejected it. But it found an enthusiastic audience in an initially obscure group of politically ambitious *Stürmer* who were intent on producing a new rupture in history, a new form of culture based on a refurbished *Sturm und Drang* ideology. They were of course the leading members of the National Socialist party in Germany. They sought out Spengler personally, to recruit him to their cause. To his credit, Spengler rebuffed them.

But to succeed they didn't need him. In greater and greater measure, their followers in the populace at large opened their hearts to the message of these self-declared new leaders, a message that once again turned away from the core concepts of the Enlightenment. Those concepts, as Isaiah Berlin and others have pointed out, were unwittingly implicated in the rise of totalitarian tyrannies because the rebellions were engineered specifically against them. But the totalitarians, as so often, were also vastly helped by the ineffectiveness and tardiness of opposing forces to mobilize themselves. And while all the earlier, nineteenth-century rebels I have mentioned would have cried out in horror, this new group adopted some of the language and orientation of Romanticism--a fact contrary to the occasional preposterous allegation (e.g., by Zygmund Bauman) that totalitarianism had its roots fully in modernity.

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¹⁶Oswald Spengler, *Der Untergang des Abendlandes: Umriss einer Morphologie der Weltgeschichte*, vol. I, *Gestalt und Wirklichkeit* (Vienna, Leipzig: Wilhelm Braumüller, 1918); Spengler, *Der Untergang des Abendlandes: Umriss einer Morphologie der Weltgeschichte* (Munich: C. H. Beck, 1980), which contains, in revised edition, both vol. I, *Gestalt und Wirklichkeit*, and vol. II, *Welthistorische Perspektiven* (originally published 1922); Spengler, *The Decline of the West*, vol. I (New York: A. A. Knopf, 1926), and vol. II (1928). Spengler's work and influence are discussed at greater length in chap. 5 of G. Holton, *Science and Anti-Science* (Cambridge: Harvard University Press, 1993).

I thus will end tracing key episodes of the rise of postmodernisms by highlighting one of the darkest phases of the anti-modern movement, insofar as it intersected with science.

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The *Naturphilosophen*, no matter how misguided or confused some of their writings seem, had been as a group rather admirable opponents of the contemporary scientific worldview. Many were deeply learned scholars, or well known poets, or serious scientists, and a few among the latter made contributions to *traditional* science despite themselves. But the more recent manifestation of the Romantic Rebellion to which I am now turning has been, in all these respects, the very opposite.

As Fritz Stern, Alan Beyerchen, Anne Harrington, and others have shown,¹⁷ the National Socialist movement, even while holding on to some pro-modern elements, especially technology, was at its inception largely rooted in various romantic ideas, whose common denominator was the rejection of much of modernity. Often these expressed themselves in so-called *völkische* concepts, characterized by idealized notions of a non-rational fiber of the German people and of its quasi-mythological pre-modern life style. These concepts, in part designed to provide a "meaningfulness" which modernism, for many, chronically lacked, were celebrated in mystical Germanic associations and Orders. The National Socialists built on that backward-looking, folk-oriented resentment of rationality. As Hitler explicitly stated in *Mein Kampf*, his ideal

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¹⁷Fritz Stern, *The Politics of Cultural Despair: A Study in the Rise of the Germanic Ideology* (Berkeley: University of California Press, 1961); Alan Beyerchen, *The Scientists Under Hitler: Politics in the Third Reich* (New Haven, CT: Yale University Press, 1977); Anne Harrington, *Reenchanted Science: Holism in German Culture from Wilhelm II to Hitler* (Princeton, NJ: Princeton University Press, 1996). See also Ute Deichmann, *Biologists under Hitler* (Cambridge: Harvard University Press, 1996), and for a study of the place given to technology, see Paul R. Josephson, *Totalitarian Science and Technology* (Atlantic Highlands, N.J.: Humanities Press, 1996).

was the "*völkische Staat*." The scientist Philipp Lenard rejected much of modern physics in favor of the ether, which he associated with the seat of the German *Geist* or spirit. He and his fellow Nobel Prize winner, Johannes Stark, in common with many others, rejected the notion of scientific objectivity by claiming that the race of the researchers would determine their physics. For example, Stark's so-called "German physics" would stress direct contact with nature, as against what he called "Jewish physics," which he charged with emphasis on theory and abstraction. A similar movement held sway in mathematics.

Out of the hellish welter of that movement I want to lift to visibility only one bizarre but telling and largely unknown example of this phase of the rebellion. In 1912, almost a decade before the first assertions of explicit Nazism in Germany, the Austrian engineer Hanns Hörbiger had his ideas published under the title *Hörbigers Glacial-Kosmogonie*.¹⁸ Later known by the title *World-Ice Theory*, the main point of the work ran as follows: The world is under the influence of the eternal warfare between two conflicting principles, Plutonism and Neptunism. Correspondingly, there exist two types of celestial bodies with polar opposite character--hot ones such as suns, and ice-covered ones. In the distant past, several of the latter type crashed into the earth, which, Hörbiger wrote, would explain a number of basic facts observable on earth now, as well as special historical events such as (of course) the destruction of Atlantis. Other ice bodies fell into the sun, with the resulting superheated water vapor explosively ejected; on cooling down, that became Cosmic Ice, most of which formed the Milky Way, the rest falling to earth as hail.¹⁹

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¹⁸Published by Hermann Kaysers Verlag, Kaiserslautern.

¹⁹For details of the theory and its influence, see Brigitte Nagel, *Die Welteislehre* (Stuttgart: Verlag für Geschichte der Naturwissenschaften und der Technik, 1991), and Robert Bowen, *Universal Ice* (London: Belhaven Press, 1993).

German scientists rejected this fable with scorn; but it became popular among the general readers, and eventually reached the highest echelons of the National Socialist regime. This point, I must interpolate, touches on my own main objection to the Romantic and antiscientific rebellion, namely that while it may subvert certain academic departments and media, diverts students from a solid education, and for the masses acts only as yet another opiate, *that rebellion is most ominous, even deadly, when adopted by political leaders*, whether in Lysenkos' Soviet Union, Mao's China, or here at home.

Among the National Socialist leadership, perhaps the most enthusiastic follower of the world-ice theory was Heinrich Himmler, graduate of Munich Technical University, Chief of the SS, and proponent of the *völkische*, backward-looking aspects of National Socialism. Believing himself to be in contact with the spirit world, he wanted to replace Christianity with his own brand of a race-based, secular religion--a paganist revival of pre-Christian Germanic practices and beliefs which contained a strong admixture of ancestor worship. To further his purpose, he initiated a number of research institutes, among them foremost one called "*Das Ahnenerbe*," dedicated to uncovering that heritage. A whole department of that organization was devoted to the world-ice theory. In Himmler's mind, it connected with his notion that the so-called Aryans had descended not from early apes but from heaven, by originating in sperms conserved in the Cosmic Ice that fell on earth. The ice mythology also suitably evoked the idea of the Nordic origin of the Aryans and the ancient Scandinavian epics. The resonance with Romantic thinking was also preserved, from Hörbiger's own writings on, in an inheritance from Nature Philosophy of the theory: that the phenomena in the universe spring from a dichotomy of two basic forces--straight out of the Romantic preoccupation with polarity we have already seen in action before, but expressed in the world-ice theory in the dualism of fire and ice.

The equally sinister figure, propaganda minister Josef Goebbels, had no reason to oppose these fantasies. His doctoral dissertation at the University of Heidelberg had the

title "Wilhelm von Schütz: A Contribution to the History of the Drama of the Romantic School"--a title which he later changed conveniently in his official biography to a more politically significant one, "The Spiritual-Political Movements in the Early Romantic Period." Schütz, by the way, was among the least productive and most maudlin early nineteenth-century Romantic poets. He was obsessed by the view that the innocence and piety that supposedly characterized pre-modern agrarian Germany was lost in modernity. His writings are replete with Romantic Forests--the title of one of his plays (1808)--and with exotic voyages, occasional dionysiac frenzy, and *Sehnsucht* for the lost homeland. At any rate, it may well be that Goebbels, among the whole lot, was the one who most shamelessly and consciously manipulated the excesses of Romanticism for the purposes of the movement.

The task of explicitly concocting a new spiritualization, to be spread widely by Goebbels and others, was given to Alfred Rosenberg, who later became also foreign affairs secretary of the Nazi Party. His book, *The Myth of the 20th Century*, was the new ideological bible defining the National-Socialist *Weltanschauung*. First published in 1930, and embraced by Hitler who otherwise insisted he had no forerunner other than Richard Wagner, Rosenberg's vicious diatribe went through at least 130 editions and was meant to reach every household. It declared "Our time, too, has its Romanticism," although one steeped in the glorification of force and "*Volksgeist*," in racism, in what he called "the deep mystery of blood." Herder's late-eighteenth-century celebration of the concept of *Volk* and *Volkstum* had undergone a grotesque perversion.

Much as one would like, one cannot avoid saying something about Hitler's own role with respect to science. By training and temperament he had no patience with the traditional Humboldtian style of *Bildung*, but rather abrogated it in favor of natural instinct--an echo of Herder's famous exclamation: "I am here not to think, but to be, feel, live!" Hitler wrote in *Mein Kampf* that the contemporary "semi-education serves the

people from the instinct of nature."²⁰ According to Hermann Rauschning,²¹ President of the Senate of Danzig, Hitler said "I don't want there to be any intellectual education," and he proclaimed that mankind now found itself at the "end of the Age of Reason." Race was the carrier of natural instinct, which needed to be liberated from the dominance of reason. An admirer of Schopenhauer, Nietzsche, and the eugenicist Houston Stewart Chamberlain, Hitler bluntly rejected core scientific principles cherished by the German professors--objectivity, truth, respect for knowledge in its own right. He proclaimed, in sentences which are uncannily similar to what can be heard today from people quite innocent of their predecessors:

"A new era of the magical explanation of the world is arising, an explanation based on Will rather than knowledge. There is no truth, in either the moral or the scientific sense. The concept of an independent *Wissenschaft*, free of any preconditions, could only emerge in the age of liberalism. It is absurd. Science is a social phenomenon....With the slogan of objective science, the professoriat only wanted to free itself from the very necessary supervision by the State.

"That which is called the crisis of science is nothing more than the gentlemen are beginning to see on their own how they have gotten on to the wrong track with their objectivity and autonomy."

For Hitler, objective science was impossible, and all attempts in that direction should end. He claimed: "there can be only a science of a certain type of mankind and within a certain period. Thus, there is a Nordic science and a national socialistic one, in contrast to the liberalistic Jewish one."²²

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²⁰ From Hitler's *Mein Kampf* (Munich:Zentralverlag der NSDAP, 1939; first published 1925), p. 469. The passage, in translation, runs as follows: "Our semi-education severs the people from the instinct of nature, it pumps into them a kind of knowledge without being able to lead them to final understanding; industriousness and good will alone won't do; it has to be, necessarily, the understanding one is born with."

²¹Hermann Rauschning, *Gespräche mit Hitler* (New York: Europe Verlag, 1940). Originally a follower of Hitler, Rauschning eventually became an opponent. Needless to say, his publication was later the subject of much debate. But whether or not Rauschning's reports all came directly from Hitler's lips, we shall see soon that the same sentiments pervaded the whole Nazi leadership.

²²Rauschning., pp. 210-11.

Not surprisingly, Hitler was also a great supporter of the world-ice theory; wholly in character, he planned to celebrate it in one of his grand architectural schemes, the transformation of the city of Linz into a new metropolis. In 1942 he discussed with Albert Speer its design, specifying a building that would contain "the three world pictures: Ptolemy's, Copernicus's, and the World-Ice Theory."²³

Finally, Hitler's position with respect to science was to be made operational throughout the educational system by the notorious Bernhard Rust, Minister for Education of all Germany. Rust used the occasion of the 550th anniversary celebration of the University of Heidelberg in 1936, before an international audience, to explain why the German authorities, from early 1933 on, had dismissed large numbers of scholars and scientists, and changed the direction of the curricula fundamentally. As Rust put it in his talk entitled "National Socialism and the Pursuit of Learning,"²⁴ you couldn't just change a few regulations. "It is our conviction that no significant reform in the pursuit of higher learning can occur except as it proceeds from a new idea of what science [*Wissenschaft*] really is....It was necessary to act with all the more rigor and firmness, in that these individuals were seen to be using as a screen for furthering their own designs the prevailing theory regarding the pursuit of learning--namely, that it must be dispassionate, objective, free from prejudice and preconception." The "expulsion" of the scientists and the other scholars was necessary, because to act otherwise would, he said, only show "tolerance toward the arch-enemy of German self-confidence." In any case, many of those expelled were "of alien blood [who] were by nature incapable of conforming their teaching to the spirit of German culture." "Science...[is] not free, in that it is rooted in

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²³*Ibid.*, p. 298.

²⁴Translated from *Das nationalistische Deutschland und die Wissenschaft* (Hamburg: Schriften des Reichsinstituts für Geschichte des neuen Deutschlands, 1936). It contains the lectures by Rust and Krieck at Heidelberg.

something other than science, namely philosophy." National Socialism's philosophical principles are the only basis on which science can find its "true objectivity."

Rust's lecture was followed by a speech by Ernst Krieck, soon to become Rector of the University of Heidelberg. His lecture was entitled "The Objectivity of Science: a Crucial Problem." He dutifully repeated the main points of Rust, but took aim at Immanuel Kant in particular for "claiming for science complete autonomy as if it were a law unto itself. The whole struggle of tradition versus reconstruction centers around one crucial concept: the objectivity of science." One must go beyond Kant, Krieck remarked, because "The case is simply this, that an idea born of the Enlightenment--that is, an idea of Western civilization, bearing the marks of a limited period--has set itself up as an absolute and declared itself a criterion applicable to all peoples and at all times. Here we have an example of Western imperialism, a bold assertion of supremacy." "One cannot, like Kant, speak of 'mankind as such.' One must keep in mind the various fundamental racial characteristics of the people concerned."

And then Professor Krieck ended with a warning to his unprotesting international audience: "We [in Germany] are called to lead the way. [It is] a path which our sister nations, some sooner, some later, are destined to tread." Starting three years later, a supine world discovered the cost of not having taken those new myth-makers seriously.²⁵

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²⁵ Because Krieck is now relatively unknown, but was a type that defined the ruling elite of that era, a few more words about him illustrate (as do the speeches of Goebbels, Rosenberg, Rust, *et al.*) the intellectual atmosphere governed by Hitler and his cohort. Ernst Krieck (1881-1946), originally a teacher in a primary school, was a fierce ideologist and voluble writer. A Nazi since the early 1920s, on 1 April 1934 he was appointed to the chair of Pedagogy and Philosophy at the University of Heidelberg. His subsequent rise was irresistible. In mid-1935, upon the dismissal of the philosopher, Ernst Hoffmann, Krieck became co-head of the Philosophical Seminar, together with Karl Jaspers. On 30 September 1937, he was made Rector of the University of Heidelberg, and remained Rector until 1 October 1938, at which time he "asked" to be relieved of these duties because his view on anthropology had annoyed Alfred Rosenberg. But Krieck remained in the chair of Pedagogy and Philosophy, and wrote numerous books on National Socialist education.

In one of them (Ernst Krieck, *Wissenschaft, Weltanschauung, Hochschulreform* (Leipzig: Armanen-Verlag, 1934, pp. 6-7, 11) we read: "Wissenschaft does not create and does not live from a knowledge of truth that is independent of time and people (*Volk*) and valid in every time and every place. Rather, it brings a truth that is *völkisch* and temporally limited and enjoined by race, character, and fate, casting it into a rational form according to the worldview....Like it or not: Nowhere shall we pursue the thing in itself, we

[Editor: keep space]

Looking back over these very different historical examples of the periodic outbreak of the enthronement of the will and the rejection of reason and order, and thinking of the outbreaks in our Age of Preposterism today, we must of course not conclude that these convulsions are connected by a neat causal line. We must exempt the current Romantic Rebels from any suspicion that they have even heard of any predecessors in the rise of today's rebellions, and of their urge to see the end of science of our day. Thus when one of them recently wrote that faith in the progressiveness of scientific rationalism has brought her to the point where "a more radical intellectual, moral, social, and political revolution [is called for] than the founders of modern Western cultures could have imagined," she surely did not know that the same sentiments characterized the German ideologues. There are also marked idiosyncrasies in today's version, most notably the postmodern horror of Unity, unlike the penchant in favor of it in the 19th-century phase.

But despite all the differences between the cases, no matter how benign or evil or even banal in each of their exemplifications, the Romantic Rebels of the past and of the present, in their very heart of hearts, share that twofold sentiment I mentioned at the beginning: that pitiable longing, that homesickness for an idealized, spiritualized Golden Age, assumed to have existed before modern science, and at the same time a more or less conscious determination to bring about a newly spiritualized future. That twofold sentiment, playing against the real and imagined failure of modernism to provide adequate answers to the psychological need for meaningfulness, is a chief source of energy and appeal of the movements--and probably always will be. Johann Wolfgang

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shall no longer reach for the object of supposedly pure knowledge, and no longer merely record the state of the world. This fiction...is gone forever..."

von Goethe hinted at this syndrome when he wrote, after studying the mechanical-materialistic book of Holbach, *System of Nature* (1770):

"But how hollow and empty we felt in this [book's] melancholic, atheistic half-night, in which the earth vanished with all its images, the heaven with all its stars. There was to be matter in motion from all eternity, and by this motion, right, left, and in every direction, without anything further, it was to produce the infinite phenomena of existence....[And yet] we felt within us something that appeared like perfect freedom of will."

I started with Isaiah Berlin's chilling observation that no one predicted that our era would be dominated by the "enthronement of the will" and the "rejection of reason and order." I have sketched aspects of two of the earlier forms of the Romantic Rebellion to help respond to his grave question, "How did this begin?" But our historical excursion may teach us also that, if insufficiently attended to, and its excesses only lazily opposed, this variegated movement, in ever-new guises, can arise to assert dominance in the future too, again and again.

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