Introduction

Science and Its "Mad Clockwork of Epicycles"

The Key to Understanding Boodin

Because Boodin always gave science such a close reading in his work, some preliminary comments on the state of science in the first half of the twentieth century are in order. If there is one single feature of science worth noting in Boodin's lifetime, it is the rise of positivism, both as a theoretical and as an operative principle that would, for many, become the reigning *Weltenschauung* underlying a host of isms that became empirical masks for a priori ideologies about the "proper" relationship between science and society. The problematic nature of the greatest of those isms—Darwinism—has been revealed by the careful work of historian John C. Greene. Almost the entire positivist program was also built upon the fiction of science as a cumulative building-block of progress, a corrective provided by Arthur Koestler and Thomas Kuhn. Once these thorny and controversial issues are examined, Boodin's difficult but courageous position as a vocal non-reductionist in a reductionist age can be seen.

Understanding Science in Boodin's Day and Ours

As we have seen, Boodin's active career lasted thirty-nine years (from 1904 to 1943). This means that he lived through three signal events—properly considered revolutions—in science: first, the rise of the Darwinian theory of evolution with the publication of *On the Origin of Species* on November 24, 1859, and its subsequent synthesis to incorporate modern genetic science

in the 1930s and 1940s; second, Einstein's special theory of relativity first proposed in a paper published June 1905 in the *Annalen der Physik* and proven in a series of confirmations from 1914 to 1916; and third, the rise of quantum theory beginning with Max Planck's "quantum of action" idea in 1900, followed by Einstein's "quantum theory of the solid state" in 1906, added to with Niels Bohr's "atom-model" that evolved over a period of time between 1913 and 1924, eventually leading to Werner Heisenberg's award of the Nobel Prize in physics for the discovery of quantum mechanics in 1932 and to Irwin Schrödinger's Nobel Prize the next year, in the committee's words, "for the discovery of new productive forms of atomic theory." Boodin would carefully follow these developments virtually as they occurred.

Such a summary invites the naive assumption that science proceeds linearly, like building blocks of seminal discoveries stacked one upon the other rising to a great intellectual edifice of human achievement. We might all dismiss this as the exuberance commonly displayed by over-achieving adolescents at the local high school science fair but for the fact that it is frequently displayed by "experts" acting as ambassadors in their respective fields to the public—E. O. Wilson, Richard Dawkins, and Stephen Hawking are examples. And if the bestseller lists are any indication, they have a large and enthusiastic audience. All of them have had distinguished careers: Wilson in myrmecology (the study of ants), Dawkins in evolutionary biology, and Hawking in theoretical physics and cosmology. All of them are examples of good scientists doing bad philosophy. One particularly egregious example is the enormous bully pulpit given to "Bill Nye the Science Guy" in his TV series funded by the National Science Foundation and aired on PBS. His principle expertise appears to lie in his ability to tie a bowtie. While most of it is pretty innocuous, he is sure to tell kids everywhere in his intro song that "science rules!" Reason and logic found new lows when Bill Nye debated Ken Ham at Ham's Creation Museum (more properly called a fundamentalist theme park) on February 4, 2014, becoming every thinking person's game of the weak.

These more recent examples notwithstanding, this attitude has a long history; much of our understanding of science today is rooted in conceptual ideas born in the seventeen century, but its cultural embodiment came two hundred years later. In fact, the term *scientist* was coined by William Whewell when the British Association for the Advancement of Science convened at Cambridge on June 24, 1833. At that meeting William Whewell pushed aside Kant's declaration that philosophy was the "Queen of the Sciences" and crowned astronomy with that honor, agreeing with Samuel Taylor Coleridge

that "natural philosopher" was "too wide and lofty" a term. Something less speculative and concrete was needed, "by analogy with *artist*," he suggested, "we may form *scientist*."[1] It was an interesting shift in perspective that not only sought to relegate the older designation of natural philosophy to the history books but also revealed an attitude toward the discipline devoted to the pursuit of wisdom to be too vague and impractical for his tastes. As significant as this was, the infatuation with science and especially with the promise of scientific progress for our purposes might be said to have begun with Auguste Comte.

The Rise of Positivism

Despite its distinctly French genesis, positivism found a small but influential group of adherents in Britain, first with Richard Congreve, who under Comte's spell openly espoused the "Religion of Humanity," started a positivist church in its name, and was openly declared head of the British arm of the movement by Comte himself in 1857. Others followed, such as Edward Spencer Beesly, John Henry Bridges, George Earlam Thorely, Frederic Harrison, John Stuart Mill, and George Henry Lewes. These British apostles of positivism were following the ideas of Auguste Comte, born in Montpellier, France, in 1798. Comte studied at the Ecole Polytechnique in Paris and befriended Saint-Simon. His initial motivation was to demonstrate that philosophy was becoming absorbed by the sciences. He eventually built this into a scientific religion that even proposed a new positivist calendar of 558 "Great Men" to replace the saints of the liturgical calendar. It was to be a "world-wide faith growing out of philosophy, with positive [hence *positivist*] knowledge at the root."[2] Comte's positivism had two aspects: the first, science validated by a hard verificationism; the second, a system of ethics best considered as secular humanism. Seeing the past as a series of organic developments, Comte always displayed an element of historicism. He accordingly saw humanity as emerging in three stages of development: from superstition and otherworldliness (the *theological* period); then what he called a "fiction of abstractions" (the *metaphysical* period); and finally the organization of knowledge into rational categories, systems, and disciplines (the *scientific* period). Put another way, human society—Comte-invented sociology—moved from legends and myths to the ideas of Plato and Aristotle to the Laws of Nature (duly capitalized to indicate their ontological significance). For positivists, then, all philosophical propositions (especially

metaphysical ones) were simply meaningless, not worthy of serious consideration. All "legitimate" inquiry could be reduced to scientific inquiry with science itself pointing the way toward virtually limitless improvements in the human condition. As such, it is really a comprehensive system best labeled as *scientism*.

This is important because the theory of evolution as presented by Charles Darwin, not only in his *Origin* but also his *Descent of Man* (1871), is really at heart a doctrine of positivism. The theory itself simply states that all life developed from common descent with the diversification of species by means of natural selection. Evolution itself wasn't new. Comte de Buffon gave an account in his *Histoire naturelle* (1749–1789) as did Jean Baptise Lamarck in *Philosophie Zoologique* (1809) and *Histoire naturelle des animaux san vertèbres* (1815). Even Darwin's grandfather Erasmus contributed a deistic version of evolution with his *Zoonomia* (1794–1796). Robert Chambers tilled the intellectual soil of Britain with transmutationism in his *Vestiges of the Natural History of Creation* (1844). Chambers's speculative and quirky work invited considerable criticism, but it also got everyone thinking and talking about transmutation. It sparked another naturalist, Alfred Russel Wallace, on his own extensive journey (first in South America, later in the Malay Archipelago) that would result in his collateral discovery of natural selection that he shared and shocked Darwin with in a long letter from the remote island of Ternate. When Darwin received it on June 18, 1858, he exclaimed, "I never saw a more striking coincidence, if Wallace had my M.S. sketch written out in 1842 he could not have made a better short abstract! Even his terms now stand as Heads of my Chapters." But Darwin's theory with natural selection as the evolutionary drivetrain was unique. As one historian explains, with natural selection, "differential death rates caused by purely natural factors created new species. God was superfluous to the process."[3] More importantly, as Curtis Johnson convincingly argues, Darwin sought to enthrone chance as an operative principle in biology, a principle that gave evolution "a single meaning to Darwin from beginning to end."[4] For Darwin, chance meant something much more than simply an "unknown cause" but rather an unknowable cause "not [due to a] lack of human understanding but rather a lack of directing rational agency."[5] Although this would develop over time, the atheistic implications were understood early on (as early as the spring of 1838 in his personal notebooks and a bit later in his "Old & Useless Notes"). Here the idea is expressed that life sprang from inorganic matter as a purely "contingent" result of responses to the immediate agencies of chemical catalysts responding stochastically to heat,

light, and other atmospheric conditions. Darwin would reiterate this idea in a letter to Joseph Hooker in 1871:

> It is often said that all the conditions for the first production of a living organism are now present, which could ever have been present. But if (& oh what a big if) we could conceive in some warm little pond with all sorts of ammonia & phosphoric salts—light, heat, electricity & c present, that a protein compound was chemically formed, ready to undergo still more complex changes, at the present day such matter would be instantly devoured, or absorbed, which would not have been the case before living creatures were formed.[6]

Darwin, it seems, had settled on this "big if" thirty-three years earlier in his private notes. As Johnson concludes, "Here, at last, we find Darwin's dangerous idea: the pure chance origin of life on this planet. Once chance governs the beginning, chance can govern all the way down. God has been ushered out the door."[7] As for morals, those too are wholly naturalistic, derived from sympathies evolved from our social instincts.[8] If we are to "be moral," we need look no further than our selves. Taken on the whole this is science wrapped in the dogmas of positivism.

Associating Darwin with positivism should not be seen as something new and avant-garde. Darwin's positivism has considerable historiographic precedence. Neal C. Gillespie discusses Darwin's positivism at length, which he has defined as "that attitude toward nature that became common among men of science . . . which saw the purpose of science as the discovery of laws which reflected the operation of purely natural or 'secondary' causes. It typically used mechanistic or materialistic models of causality," and he rejected any supernatural or teleological factors that it regarded as beyond the scientific pale.[9] Intellectual historian John C. Greene agrees with Gillespie as have others.[10] In his theory of social evolution, Greene calls Herbert Spencer a "Darwinian before Darwin" with his emphasis on population pressure and survival of the fittest. "Both [Spencer and Darwin] were powerfully influenced by the positivistic faith of nineteenth-century science as the sovereign key to knowledge of reality."[11]

Given Darwin's strong inclination toward positivism one would think both he and his outspoken apostle, Thomas Henry Huxley, would have been drawn to the British Comteans. After all, both had almost limitless faiths in science and were equally wary of traditional religion. But Huxley was a

vocal opponent of positivism and serves as a good example of why neither he nor Darwin ever joined with Comte's British allies. Huxley was opposed only to the Comtean window dressing added to its more substantive program of hard verificationism, rejection of metaphysical speculation, and insistence that knowledge can be reduced to the senses. Huxley had no patience with a "Religion of Humanity," a positivist priesthood, or what he derisively called "Catholicism *minus* Christianity."[12] As historian Neal Gillespie puts it, for Huxley, "It was not enough to drive out the old ideas. Their advocates had to be driven out of the scientific community as well. . . . In order for the world to be made safe for positive science, its practitioners had to occupy the seats of power as well as win the war of ideas."[13] It would do no good to build a new scientific order upon old ecclesiastical trappings and notions of a humanistic religion. In this sense, Huxley's opposition to the positivists of his day made perfect sense. This notwithstanding, English positivist Frederic Harrison, who sparred with Huxley on several occasions, emphasized their many points of agreement and even offered to bestow Darwin's bulldog honorary membership in the positivist movement. Huxley, for his part, was willing to accept Harrison's olive branch "from the plenipotentiary of latter-day positivism" only if offered under better terms, presumably without the absurd Comtean baggage.

Getting "Caught on the Scientistic Horn of the Positivist Dilemma"

Much more will be said concerning Darwin's evolutionary theory in chapter 3 (including its advance with the neo-Darwinian synthesis in the 1930s and 1940s), but more immediately, within the context of the present discussion and as an idea, positivism faces at least four serious dilemmas. The first is that the positivistic faith in science claims to be based upon some idea of hard commitment to reality but cannot escape its own naiveté on the subject. Science simply is not a discipline of steady or cumulative advance. Thomas Kuhn, for example, has stressed science as a noncumulative process. In effect, these revolutions in our understanding of nature remake the scientific discipline anew. Kuhn argues that scientific disciplines rest upon paradigms (i.e., "universally recognized scientific achievements that for a time provide model problems and solutions to a community of practitioners") and that accumulating anomalies push these paradigms to the breaking point. The ensuing crisis in any one of them at a given time develops into a full-

fledged revolution in which the old order collapses and a new one emerges, transforming the nature of the discipline itself under a fresh paradigmatic structure.[14] Interestingly, Kuhn sees Darwin's theory as a "very nearly perfect" example regarding progress through resolution of a revolution. Greene is less convinced. He sees Kuhn's model as "sealed off" from significant outside issues of politics, power, and national cultures. He is doubtful that Darwinism even fits the Kuhnian idea of a revolution since Darwin's theory arose not amidst pressing anomalies within biology but instead from other outside influences, especially in geology, to wit, Lyell's uniformitarianism. Kuhn also fails to consider counter-paradigms from Buffon or Lamarck.[15] Kuhn does have something valuable to say about the noncumulative nature of science, but it is also a limited monistic, non-contextual model of scientific change.

But we didn't need Kuhn to tell us that science was not a cumulative enterprise. The fascinating polymath, Arthur Koester, told us as much several years before:

> In fact, we have seen that this [scientific] progress was neither "continuous" nor "organic." The philosophy of nature evolved by occasional leaps and bounds alternating with delusional pursuits, *culs-de-sac*, regressions, periods of blindness, and amnesia. The great discoveries which determined its course were sometimes the unexpected by-products of a chase after quite different hares. At other times, the process of discovery consisted merely in the cleaning away of the rubbish that blocked the path, or in the rearranging of existing items of knowledge in a different pattern. The mad clockwork of epicycles was kept going for two thousand years; and Europe knew less geometry in the fifteenth century than in Archimedes' time.[16]

The positivist faith in science was a curious one indeed, not one that could instill a great enthusiasm for the future of humanity. Was the technocratic world that produced the Bomb, global pollution, eugenic genocide, and urban clutter one to instill confidence in positivists' hope for science? Was it really better than the theological world it supposedly improved upon? Koestler thought not. "A puppet of the Gods is a tragic figure," he admitted, but "a puppet suspended on his chromosomes is merely grotesque."[17]

A second positivist dilemma is its insistence that philosophy and metaphysics are meaningless while they boldly—and apparently blindly—express a myriad of metaphysical positions. This was particularly noted with regard

to the so-called logical positivists, Comte's twentieth-century permutation especially in the Vienna Circle founded by Moritz Schlick in 1924 that included Gustav Bergmann, Rudolf Carnap, and Herbert Feigl. Alfred North Whitehead in his *Adventures of Ideas* chided scientists and even some philosophers for avoiding metaphysics by saving "the importance of science by an implicit recurrence to their metaphysical persuasion that the past does in fact condition the future."[18] Similarly, Philip Paul Weiner complained that

> neo-positivists [logical positivists] who define the class of possible operations by reference to future acts of verification can do so only by assigning some metaphysical status to time. The necessity of a temporal distinction in distinguishing operationally actual from possible operations presupposes an absolute assumption about the temporal character of existence and knowledge. This implicit reference to a constant flow of events falls in the class of materially certain and necessary truths. How can this assertion be made compatible with the neo-positivist doctrine that all necessary propositions refer only to the tautologies of discourse and not to events?[19]

As Brian G. Henning has wryly observed, "One can choose one's metaphysic, but one cannot choose not to have a metaphysic."[20]

A third dilemma in positivism relates not just to its rejection of metaphysics but its demand for a *conclusive verification* that is impossible to meet. This is not an undesirable goal, but realistically it is simply unrealizable in all instances. Hilary Putnam's favorite example is the statement that "there are no extraterrestrials in the universe" is not amenable to conclusive verification; there might be some verification if ever we contact them or they choose to contact us, but if that statement is true, it will never be conclusively verified. Yet the statement itself should not be regarded as meaningless. In fact, Putnam uses the positivists notion of verification to distinguish them from the pragmatists. "In short," writes Putnam, "for the positivists, the whole idea was that the verification principle should *exclude* metaphysics (even if they were mistaken in thinking that their own ideas were simply scientific and not metaphysical), while for the pragmatists the idea was that it should *apply to* metaphysics, so that metaphysics might become a responsible and significant enterprise. There is all the difference in the world between these attitudes."[21]

Finally is what Greene calls "the scientistic horn of the positivist's dilemma." If science is so narrowly defined so as to exclude all value judgments, all nonempirical statements, then how is *anything* to be regarded as valuable or important? In fact, why should there be any passion for systematic inquiry at all? If, on the other hand, science can serve as a reliable guide to human destiny, which one do we choose: Julian Huxley's humanism, Comtean humanism, Watson and Skinner's behaviorism, Galton's eugenics, Marx's communism, Freud's psychoanalysis, Jung's analytic psychology, and so on? As Greene concludes, "In the ensuing struggle the central idea of science as an enterprise in which all qualified observers can agree as to what the evidence proves vanishes from sight. Thus, whichever horn of the dilemma the positivist takes, science is the loser."[22] In effect, science confronts its own scientism.

In the end, Darwin's attachment to chance as a real force in nature and the constant pull of positivism caught him up near the end of his life in a rather sad nihilism. He told William Graham less than a year before his death, "You have expressed my inward conviction, though far more vividly and clearly than I could have done, that the Universe is not the result of chance. But then with me the horrid doubt always arises whether the convictions of man's mind, which has been developed from the mind of the lower animals, are of any value or at all trustworthy. Would any one trust in the convictions of a monkey's mind, if there are any convictions in such a mind?"[23]

Science versus Scientism and the Pragmatists' Answer

Of course, the problem being delineated here is not science but scientism. The pursuit of systematic inquiry into natural phenomena has yielded wondrous benefits in many ways, and it is as old as human endeavor itself. All the pragmatists appreciated science, Boodin not the least of them. But as a human endeavor it is not omnipotent. When it engages in boundary transgressions into other areas of human inquiry—philosophy, theology, the arts—problems arise. We have been discussing this in the previous section primarily in terms of biology, but it can be seen in physics as well (another discipline that Boodin followed closely). Unfortunately, this seems least appreciated by some of the most popular physicists who are most ready to discard the one discipline most capable of making sense of the physical world's

data. The renowned Richard Feynman was always scornful of philosophy, the late theoretical physicist/cosmologist Stephen Hawking has proclaimed that "philosophy is dead," and astrophysicist Neil deGrasse Tyson considers it "useless." Of course, there are important exceptions like Werner Heisenberg, who was no stranger to philosophy having read Plato's *Timaeus* as a youth hiking through the Bavarian Alps. In answer to the question "Who was right the atomist materialists or the platonic realists?" he said, "I think that modern physics has definitely decided in favour of Plato. In fact these smallest units of matter are not physical objects in the ordinary sense; they are forms, ideas which can be expressed unambiguously only in mathematical language."[24] Also, theoretical physicist Freeman Dyson has escaped the sickness of scientism.[25] Not so with these high-profile nay-sayers who have lodged themselves within our popular culture as authoritative spokesmen for science. Feynman's books are still readily available and read, Hawking's status is iconic, and Tyson's presence seems ubiquitous on major media outlets, from PBS's *NOVA* to his own television series *Cosmos: A Spacetime Odyssey* and most recently his *StarTalk* guest interview show currently aired on the National Geographic channel. Nobel laureate in physics Frank Wilczek, despite his eloquent portrayals of the universe in *A Beautiful Question* (2015) and *Fundamentals* (2021), clearly believes that if science is not omnipotent it is surely potentially omniscient to any question that reasonably "makes sense." This is just another variation on scientism since what "makes sense" is, for Wilczek, cast within his magisterium of science and it alone.

Sociologist Stanley Aronowitz knows better. Science is never an enterprise divorced from the society in which it resides. He writes: "As scientific discourse permeates state and civil society, scientific culture spills over beyond the laboratory. Business dares make no decisions that are not grounded on mathematical calculation that provides projections; legislators enact laws based on 'data' generated by scientifically trained experts."[26] Science today is subsumed by financially and politically powerful agencies sporting three-letter acronyms like the NIH, NSF, CDC, and FDA, all (with the exception of the NSF) well under way during Boodin's lifetime. ln this manner society itself becomes subservient to technocratic elites, and however innocent and well-intentioned their motives, it soon finds itself dominated by an ethos of scientism. As Aronowitz explains, "At issue is the claim of enlightenment science to certainty and its refusal to acknowledge its own discourse as a form of ideology."[27] As the physicists described above search for a "unified theory" that can dispense with the untidy issues raised outside their field, Aronowitz wisely points out, "The facts do not speak for themselves and,

through this door, marches religion and other metaphysical doctrines as well as philosophy."[28] It is this door so many high-profile physicists and biologists wish to close.

In some ways there is nothing new here. Those who would deign to speak on behalf of today's science are quick to chide their medieval forebearers like John Buridan, Nicholas of Autrecourt, Thomas Bradwardine, Duns Scotus, and Roger Bacon of being constrained by the superstitions of the Church; they believe too readily in the myth of science and religion warfare and suffer from presentism, conveniently forgetting that their science suffers from its own constraints. "The popular image of the medieval Church as a monolithic institution opposing any sort of scientific speculation is clearly inaccurate. . . . But the price of having a rich sponsor," writes James Hannam, "is having to bend to their interests and avoid subjects they find controversial. Modern scientific researchers competing for funds from big companies have exactly the same problem. The Church allowed natural philosophers a much wider dispensation than many corporate interests allow their researchers today."[29] Then as now, we need to be reminded that science is a method and an approach that is not a system of ultimate beliefs; it cannot be decontextualized or reified into an idol. Science, as historian Steven Shapin reminds us, is "never pure."[30] When it sports an "ism" it becomes even less pure, not because isms are necessarily bad—they stand or fall on their own merits—but because there is no surer sign of a boundary transgression between science and philosophy as when the former becomes an ism. Boodin surely has his isms but they are part of his overall philosophical outlook and not part of an allegedly "purely" scientific credo.

This leads to one of the untoward consequences of scientism—its role in what Hilary Putnam has productively critiqued as the fact/value dichotomy. It is, in fact, according to Putnam, the dangerous legacy of logical positivism: the notion that values are *subjective*, beyond the scope of rational argument. Putnam insists that there can be responsible inquiry into value questions. This is, of course, of immense practical importance in affirming certain normative values in society. Here a number of philosophers of science must claim a certain responsibility for the problem. Putnam's masterful summation brings us back to the pragmatists and is worth quoting at length:

> I have argued that my pragmatist teachers were right: "Knowledge of facts presupposes knowledge of values." But the history of the philosophy of science in the last half century has largely been attempts—some of which would be amusing, if the suspicion

> of the very idea of justifying a value judgment that underlies them were not so serious in its implications—to evade the issue. Apparently any fantasy—the fantasy of doing science using only deductive logic (Popper), the fantasy of vindicating induction deductively (Reichenbach), the fantasy of reducing science to a simple sampling algorithm (Carnap), the fantasy of selecting theories given a mysteriously available set of "true observation conditionals," or, alternatively, "settling for psychology" (both Quine)—is regarded as preferable to rethinking the whole dogma (the last dogma of empiricism?) that facts are objective and values are subjective and "never the twain shall meet." That rethinking is what pragmatists have been calling for for over a century. When will we stop evading the issue and give the pragmatist challenge the serious attention it deserves?[31]

Some may be confused by William James's call for radical empiricism, thinking it has some relationship to an undue—perhaps even a scientistic—attachment to science. But as James Woelfel has explained, James "remains a fresh and timely voice on a range of contemporary issues" that include "an open-ended attentiveness to the richly nuanced concreteness and complexity of experience that refuses to reduce either the human phenomenon or the universe itself to the boundaries set by the sciences."[32] For James, *radical* empiricism was not radical in its reductionism at all but instead in its thoroughgoing commitment to *experience*, indeed an ontology of pluralistic "pure experience." Unlike those who would sacrifice values on the altar of science, James rescues values from such an inglorious fate. He fears an all-embracing science that threatens "the diminution of man's importance." The practical import of this is that "James promises us an outlook that will enable us to hold on to both our love of fact and our confidence in our 'human values,' " write Ruth and Hilary Putnam, "and do so without transcendentalizing those values that they become ineffectual."[33]

Another pragmatist response to scientism can be found in John Dewey. Although Dewey's appreciation for scientific method sometimes associates him with positivism or even scientism, some regard this as an unfair and superficial reading. More will be said on this in chapter 6, but Deweyites insist that his appreciation of science never meant it to be the *only* valid epistemology. For Dewey, the association of what is known with what is real is a serious "intellectual fallacy." Knowledge cannot, for Dewey, be reduced

to science alone; experience is pluralistic in a way that science gives but one of many pictures. Scientific method as Dewey sees it is at once experimental and fallible. Dewey's call for a "scientific treatment of morality" is not, on a Deweyite reading, positivistic or scientistic. Gert Biesta makes a case "that rather than aiming for a scientific treatment of morality, Dewey was actually articulating a moral treatment of science."[34] In this Dewey made a lot of assumptions about how science has transformed our understanding of the world and was too taken in by the Darwinian explanatory lure, but his main concern expressed as "How is science to be accepted and yet the realm of values to be conserved?" is not for Deweyites amenable to a positivistic relegation of values to subjectivity.[35] Interestingly, this was not entirely Boodin's interpretation of Dewey, which we will examine later.

Back to Boodin

It is within this complex milieu of ideas that Boodin grappled—the rise of positivism and scientism and its impact on philosophy, all of which are being keenly felt today. While confounding and marginalizing him professionally, it also gave him significant opportunities to craft an alternative philosophical view and metaphysical vision. Nothing makes you stand out better than when you are battling a clear and present danger. The pressing issues outlined in the previous section should make clear the relevance of Boodin today. We can thus see in Boodin James's pragmatism and Royce's absolutism, but he made his own way and developed his distinctive answers to our relationship with nature and the universe. Having examined all his published work, I cannot see Boodin as anything other than an underappreciated philosopher of the first rank whose poetic writing style and perceptive grasp of twentieth-century science and the history of philosophy deserves a fresh reading and a fair review. Moreover, Boodin did something James was never able to do, complete a comprehensive metaphysic. Boodin was able to creatively transform the ideas of James and Royce into something genuinely new and, I believe, important.

We are now able to begin our intellectual journey with Boodin in earnest. In the pages that follow, Boodin's ideas will be presented as completely and systematically as possible. In so doing I have not relied on Boodin's private papers and correspondence, which reside in the special collections of UCLA. If this were a conventional biography that material would be

indispensable, but, as mentioned earlier, this is not a biography. Boodin's ideas as presented in the public arena are of interest here. We will begin with an examination of Boodin's epistemology in his treatment of time.

Before proceeding, however, it might be appropriate to end this introductory chapter with a sense of the poetic spirit of his writing. It comes out periodically, but initially in the opening chapter to *A Realistic Universe*, "The Divine Five-Fold Truth." Designed as a lead to his metaphysics, despite its beauty it is not expansive enough to capture the whole of his philosophy. For that "Reality as Actuality" in his *Studies in Philosophy* seems a better candidate. It appears as he left it and as Donald Ayres Piatt published it seven years after his death. It serves as an interesting expression of his life and his work as he perceived it, emphasizing those themes—community, time, space, history, nature, and the cosmos—that formed such an intimate part of his thought. Here is Boodin's love of science, of life, of faith, and of philosophy waxing most eloquent:

> I live in a community of time and space. Temporarily I am old as life. The history of life is my history. In me are the "recollections," the traces of the whole history of life; and in its general features my history recapitulates this history, though the perspective has been, in many ways, foreshortened. Walt Whitman gives this expression to his idea in poetic form in *Song of Myself*:
>
> > I find I incorporate gneiss [rock], coal, long-threaded
> > moss, frutis, grains, esculent roots
> > And am stucc'd with quadrupeds and birds all over,
> > And have distanced what is behind me for good reasons,
> > And call anything back again when I desire it.
>
> Of course we must not expect accurate description from a poet, but his intuition is sound. We are part of the temporal community of life. The history of life is my history—a history of adaptation to the cosmos. I am as old as the hills and older. The constituents of my body were forged prospectively through the history of the earth and the sun, back to the nebula from which the sun was born. In the crucible of nature the elements of my body were formed in due proportion. In the backward view, nothing is foreign to me. And the form of the future is indicated in the history that has passed and is, as the man is

indicated in the conditions of nature in his embryonic history. The restlessness of dust is part of my inheritance as are the passions of the animals—their love and hate—and man's long groping to find a satisfactory life in union with his fellow man and nature.

I live in a community of space. The extensity of my life in space comprises the whole cosmos. I am part not only of the field of the earth with its atmosphere and of the sun of which our earth is a part, but my life includes the most distant galaxies. Cosmic radiation from the most distant parts affects my life, though unknown to me; so that my life would be different if this radiation were different. I am part of a community of space as well as of time. This whole sensed world is part of me and much that I do not sense. Sirius is part of me and I am Sirius in this perspective. The world is mine and all its glory—and tragedy. But I also have a wealth that belongs to me alone, of feeling and emotion, of will and thought; and before this richness, the magnificence of the stars pales.

And I am part of the theme, the space-time structure, of the whole which is expressed in the vast drama of time and space, which governs the entrances and exits of galaxies as well as our entrances and exits. Time is immense and space is immense but eternity is a theme that pervades time and space and gives rhythm and order to change in a contingent world. The rhythm of electrons, of atoms, of life is an expression of this universal order. And this is an order of time and not merely of space. To stop time would be an end to all music and drama. It would mean the freezing of chaos. If we could view the cosmos from the point of view of the whole, the symphonic structure of the field of fields, we would see the cosmos as the actuality which descends centrifugally, through various levels of spirit, soul, and body, thus engendering a centripetal striving towards the actuality of the field of fields. But the relation is not a simple logical relation from premises to conclusion. The relation is a creative interaction of fields within a pluralistic world—a world of contingencies where the parts may fail and often do fail of adjustment, with consequent tragedy. Without tragedy there can be no progress. Without suffering we cannot learn our failure. And the spirit of the whole must love and suffer (in a way we cannot understand) or there can be no atonement, no harmonization.

> Within this drama, my personality is the intersection with the route of nature, viewed from my perspective, not only with the contemporary community, physical and spiritual, but also with the whole direction, the ought, the eternal Logos as it becomes incarnate in finite relationships. In this cosmic symphony of movement, my vocation is to realize my actuality, as I am able and ready, from my perspective in harmony with the whole.[36]