CHAPTER VIII

A New Philosophy of Nature

i/ The invitation to give a course of eight lectures at the Lowell Institute. Character of this lectureship. The change in Whitehead’s title. Delivery of the first lecture. The thesis to be illustrated in the course. Writing the Lowell Lectures.

ii/ Publication of the books Whitehead wrote in America. Macmillan’s donation of its Whitehead correspondence. Macmillan’s early information that Whitehead would be a Lowell Lecturer.

iii/ Advance from relatedness of extended events (Enquiry) to activity of realizing a value. Comparison with Spinoza. Wordsworth and Shelley. Use of “Value.”


v/ Additions to the Lowell Lectures for manuscript of Science and the Modern World. Its two subjects. Early publication.

vi/ Big sale. Cambridge’s mistake. Invitation from the Atlantic Monthly, and Whitehead’s reply.

vii/ Whitehead’s feeling about science. Concern with rival cosmologies. The preachers of scientific method.
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x/Epistemology in *Science and the Modern World*. Whitehead’s account of the genesis of his organic philosophy.


xii/Samuel Alexander and his way of philosophizing. Alexander’s influence on Whitehead. Whitehead’s marginalia in *Space, Time, and Deity*. Alexander on the quality of deity; Whitehead on God’s primordial nature.

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xiv/Arrangements with the Macmillan Company to publish *Science and the Modern World*. Whitehead’s attitude toward business. His wife’s role.
With Whitehead's acceptance of the Harvard professorship in hand, President Lowell was able on March 18, 1924, to invite him to deliver a course of eight lectures for the Lowell Institute in Boston, on any subject he pleased. Whitehead accepted this invitation on April 1, choosing as his subject “Three Centuries of Natural Philosophy.” He explained that he would sketch in broad outline the growth of modern science with especial reference to its influence on modern mentality, and to the influence of technology on the social structure, comparing it to the effect of the rise of literature in the first millennium B.C. as the result of the popularization of writing.

Whitehead added that, as Lowell knew the audience intimately, he would be “grateful for any suggestion or criticism as to the suitability of this line of thought.” In his reply Lowell expressed delight that Whitehead could give the eight-lecture course, and commented:

the subject of “Three Centuries of Natural Philosophy,” with the outline you give of it, seems to be very good. Of course you cannot expect a large audience, but that is quite unimportant.¹

No one else’s opinion mattered at this point; A. Lawrence Lowell was the sole trustee of the Institute.² His own preference ran toward lecturers on history—political history. Providing several series of free public lectures was no longer, as it had been in the nineteenth century, the primary function of the Lowell Institute, but it was still a notable one; the invitation that came to Whitehead was an honor. The likelihood that the lecturer would present important new ideas was always

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much in this trustee’s mind, as it had been in his predecessors’ minds. Often a Lowell Lecturer turned his lectures into a book. William James’s *Pragmatism* and Bertrand Russell’s *Our Knowledge of the External World* (which Russell read out under the title, “Scientific Method in Philosophy”) were recent examples. As the fee was only $100 per lecture, the opportunity to formulate the ideas for his next book was generally an invited lecturer’s main reason for accepting; so it was in Whitehead’s case. He consulted his Bostonian friend Jim Woods on the propriety of composing his Lowell Lectures with the book more in mind than the audience, and was reassured.

Before Whitehead left London for the American Cambridge, he sent material for announcing his eight lectures to the Institute’s curator, Professor William H. Lawrence, and with this material, a suggestion for changing the overall title. The new title would be “Science and the Modern World.” This fitted the lectures that were delivered a little better than “Three Centuries of Natural Philosophy,” but no short title could be adequate. At the University of London on January 24, 1923, Whitehead, one of eight scientists giving single lectures on “Some Aspects of Natural Philosophy,” called his “The Quest of Science Today and as Exemplified in Its History.” What a cumbersome title that was! Accurate, no doubt, but pure Whiteheadese. I don’t think he felt any need to talk to Evelyn about a single scientific lecture at London University. He did talk to her quite fully about his American undertakings. Probably the title “Science and the Modern World” was Evelyn’s idea. She had a good sense for what would sell.

The lectures were scheduled for February 1925; they would be at 5:00 P.M. on Mondays and Thursdays (excepting February 23), and would conclude March 2. The place was Huntington Hall, in the Rogers Building (since razed), at 491 Boylston Street. The lectures were free and open to anyone, but tickets had to be obtained from the Lowell Institute.

At precisely five o’clock on Monday, February 2, the center door to the stage of the hall opened and a tall beadle stepped forward, followed by a small, short man with a manuscript. The lectern was too tall for him to see the audience over its top, so the beadle procured a card table and set it beside the lectern. Professor Whitehead could see his audience by standing behind the card table to read his lecture. Who introduced him? Nobody. This course of lectures had been advertised in the *Boston Evening Transcript*. What the lecturer had to say would show how justified the trustee was in choosing him. There was no need for
the platoon of vice-presidents, deans, department chairmen, and colleagues, which nowadays precedes invited speakers everywhere. Professor Henderson and Harvard administrators could have obliged, but “No introductions” had been one of the founder’s stipulations for the Lowell Lectures. He was a smart man.

Huntington Hall could seat 900. The first lecture, entitled “Science and Modern Civilization,” was entirely about the origins of modern science. It attracted a large audience, but Whitehead’s high-pitched, bell-like voice did not carry beyond the first few rows. That was especially unfortunate, because he was making his debut as a philosopher before the educated public, and the lecture was profound. I shall not go over its argument, but I must call attention to his careful language in stating the thesis of the lecture course. After placing his audience in the sixteenth century and contrasting the quiet beginnings of science with the bloodshed of the Reformation, Whitehead said,

The thesis which these lectures will illustrate is that this quiet growth of science has practically recoloured our mentality so that modes of thought which in former times were exceptional, are now broadly spread through the educated world.4

Most writers would not bother to avoid saying that they will demonstrate their thesis, but the logician Whitehead used that word sparingly. Then he went on to qualify his thesis:

Perhaps my metaphor of a new colour is too strong. What I mean is just that slightest change of tone which yet makes all the difference.

To illustrate this he used William James’s phrase “irreducible and stubborn facts,” and asserted that the union of passionate interest in them “with equal devotion to abstract generalisation” is the novelty that science has brought to our mentality. The villain of the story, “scientific materialism,” was introduced near the close of this lecture.

I have not found a transcript of the Lowell Lectures as delivered, and so have been quoting from the first edition of the book Science and the Modern World, relying on Whitehead’s assertion in the Preface of that volume that the Lowell Lectures, “with some slight expansion, . . . are here printed as delivered,” with the addition of a few chapters.

On December 21, 1924, Whitehead wrote a birthday letter to North.* After saying that Harvard’s three-week first-term examina-

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*North was born on December 31, 1891.
tion period in January would be “a complete holiday” for him,* he continued:

I want the time to write up the eight Lowell Lectures which come off in February. I have now broken the back of the second lecture† and have thought out the whole course. But I want to have them nearly all finished before the course begins.

Fifteen years later he told Lucien Price, “I was never more than one week ahead.” These lectures formed his first public pronouncement in America, and so he spent much time perfecting them. Until all had been delivered, Whitehead gave up his usual letters to North. On March 15 he wrote him that the Lowell Lectures “amounted to writing a book in about two months,” and “were a great strain on me.”

The publisher of the books that Whitehead wrote in America was the Macmillan Company of New York; Cambridge brought out English editions a few months later.‡

In 1966, when both Whitehead and his wife were dead, Macmillan donated its Whitehead file to the New York Public Library. Much of it went elsewhere or was lost; the Library received only items dated between mid-1924 and late 1927, and four dated 1938.⁶

The first item in the Library’s collection is a memorandum dated June 27, 1924, from Macmillan’s President, George P. Brett, to his Assistant, Curtice N. Hitchcock. It says that Whitehead has accepted a chair in philosophy at Harvard for the next five years, and will give Lowell Lectures next winter on “Three Centuries of Science.” “We ought to get in touch with Professor Whitehead the moment he arrives or even before in order to secure this book for American publication.” On July 1 Hitchcock wrote a businesslike letter to Whitehead, reminding him that for many years Macmillan, as the American representative of the Cambridge University Press (which had no New York office at

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*Raphael Demos, as his assistant, would read the examination papers for Whitehead’s lecture course.
†This, on the seventeenth century, was printed as Chapter III in Science and the Modern World.
‡However, the Princeton University Press published, as The Function of Reason, a set of three lectures which Whitehead delivered at Princeton in 1929, and the University of Chicago Press published two lectures (Nature and Life), given there in 1934; the English editions of these works were by Oxford and Cambridge, respectively.
this time), had sponsored his books in the United States. Whitehead never replied to this overture. In the New York Public Library collection there are only two letters from him, but there are many fascinating letters written to Hitchcock by Evelyn, acting as her husband's business manager; I shall discuss them later.*

Brett's memorandum to Hitchcock was accompanied by two pages from the Quotation section of the May 2, 1924, issue of Science. The journal reprinted an unsigned article from the English journal Nature which announced Whitehead's imminent move to Harvard for five years. This article gave a well-informed account of what he planned to do there, and criticized the British university system for the "inelasticity" that made it necessary for a man of such "eminence, charm of manner, and inspiring intercourse" to go elsewhere for "the opportunity of completing his research."

The author had to be some admirer of Whitehead who knew all about the Harvard appointment. He could have been Henry Osborn Taylor or L. J. Henderson, or a close English friend like T. P. Nunn. The forthcoming Lowell Lectures were not mentioned, being outside the intent of this article.

Taylor was probably the source of Brett's early information about the Lowell Lectures. Macmillan was his own publisher. Later, when Science and the Modern World came out and the Whiteheads did not want Macmillan to sell a specially low-priced edition to the New Republic for use as a gift to new subscribers, Taylor was the friend who suggested that Macmillan send Whitehead a suitable royalty agreement; he was the intermediary.

Other facts about the publication of Science and the Modern World will be noticed in later sections of this chapter. It is time now to consider the philosophy of nature that Whitehead expounded in this book. I shall continue to reserve the phrase "philosophy of natural science" for the three books written in his last years in England, which were discussed in Chapter VI.

Recall that in the first chapter of his Enquiry Whitehead asserted that the fundamental characteristic of nature is its passage, or creative advance. But in that book as published in 1919, this was treated as little

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*See Section xiv of this chapter.
more than the temporal dimension of the extensive relatedness of events. In Note II to the second edition—its Preface was dated August, 1924—Whitehead said that the correct doctrine, that not extension but “process” is the fundamental idea, “was not in my mind with sufficient emphasis.” In Note I, referring to the work he hoped “to undertake in the immediate future,” he spoke of analyzing “the process of the realization of social entities.” The difference between the words relatedness and realization marks the difference between the standpoint of the earlier philosophy of natural science and that of the new philosophy of nature.

In the Lowell Lectures, the creative advance of nature is conceived as the outcome of an “underlying activity of realization.” Noting an analogy with Spinoza, Whitehead says,

His one substance is for me the one underlying activity of realization individualising itself in an interlocked plurality of modes.8

These modes are finite events. Is there something that they all have in common because it is the essence of realization in itself? Whitehead raises this question and gives his answer to it in the chapter “The Romantic Reaction,” immediately after presenting the views of nature that he found in Wordsworth and Shelley. He calls the romantic reaction to the triumph of scientific materialism “a protest on behalf of value.”9 In his philosophy of natural science, Whitehead fenced nature in by deliberately excluding any reference to values, moral or aesthetic. As he put it in The Concept of Nature,

The values of nature are perhaps the key to the metaphysical synthesis of existence. But such a synthesis is exactly what I am not attempting.10

In Science and the Modern World, when Whitehead brings up the question of what it is that emerges into actuality in every event, he notes that no one word can be adequate and nothing may be left out; still, he has a ready answer.

Remembering the poetic rendering of our concrete experience, we see at once that the element of value, of being valuable, of having value, of being an end in itself, of being something which is for its own sake, must not be omitted in any account of an event as the most concrete actual something. “Value” is the word I use for the intrinsic reality of an event.11
There is another basic concept which Whitehead introduced into his new philosophy of nature when he appealed to Wordsworth and Shelley: eternality. His notion was that of an infinite realm of "eternal objects." Examples of such objects are colors, shapes, forms, and character that an event may exhibit. He analyzed this realm in the chapter "Abstraction," which he added to the Lowell Lectures. He shunned the name "universal" for an eternal object, as he wanted nothing but what he said about this category to be in the reader's mind. In an accompanying added chapter, "God," he presented his concept of God. God is a principle, the "Principle of Concretion" that is required if a particular concrete event is to issue from earlier events and the welter of eternal objects. Whitehead's God is the supreme metaphysical ground of limitation.

A fundamental concept which appears in Science and the Modern World was introduced early in the Lowell Lectures. Whitehead gave it the name "prehension." He explained that this word was to mean apprehension which is not necessarily cognitive. When one event, or "actual occasion" (as he came to call them), takes account of another in its environment, that is a prehension of the environmental occasion. In the prehending occasion, many concurrent prehensions are integrated. Whitehead calls the integrating occasion an organism. By that word he generally means a temporally bounded process which organizes a variety of given elements into a new whole.

Whitehead's idea that nature consists of organisms is his alternative to the traditional idea that it consists of bits of matter, each of which has the property of simple location, that is,

in expressing its spatio-temporal relations, it is adequate to state that it is where it is, in a definite finite region of space, and throughout a definite finite duration of time, apart from any essential reference of the relations of that bit of matter to other regions of space and to other durations of time.

The meaning of simple location is independent of the adoption of an absolute or a relative theory of space and time. In the account of our perception of nature that Whitehead inserted into his Lowell Lectures, he maintained that we never perceive simply located bits of matter. But it is possible to arrive at them by constructive abstraction from the prehensive unifications of which we are aware. The real error of the scientific scheme that was so victorious in the eighteenth century and
prevailed through the nineteenth consisted in mistaking its powerful abstractions for the concrete realities of nature.\textsuperscript{18}

V

Whitehead sent the manuscript of \textit{Science and the Modern World} off to New York on July 9, 1925. In his covering letter, addressed to “The Manager, The Macmillan Company,” he wrote, “If you can push through the printing, we can get the book on the market for this autumn.” The Cambridge University Press, he said, did not find it necessary to send him galleys. He had gone carefully over this typescript, and would be able to return page proofs “within 24 hours of their receipt.” Once Whitehead had finished with a piece of writing, he wanted pronto to move on. And he hoped that his philosophical ideas would attract a wide public. I expect that he was most eager to know what reception the non-historical parts of the book would get. The chapters entitled “Abstraction” and “God” were not at all about science and the modern world; they were the first-published parts of the general metaphysics he was adumbrating. He never wrote to please his readers, but he was anxious to see how the ideas that he had not had a chance to develop and express in England made out in the New World.

Macmillan published the book in October, 1925.

In his letter of July 9 Whitehead explained that besides the addition of these two new chapters to the Lowell Lectures, “slightly expanded, as mentioned in the contract,”* his manuscript included two lectures delivered elsewhere but not yet published. One, “Religion and Science,” was, so far as I know, his first public post-war utterance on religion; he had given it on April 5 as a Phillips Brooks Lecture at Harvard.\textdagger The other, “Mathematics as an Element in the History of Thought,” was a lecture he had given on April 14 to a special meeting of the Mathematics Club at Brown University.

In the Preface to \textit{Science and the Modern World}, which Whitehead dated June 29, 1925, he said that the additions to the Lowell Lectures were meant “to complete the thought of the book on a scale which

*In the contract, dated June 24, 1925, and signed by Whitehead and President Brett of Macmillan, Whitehead gave the company the sole right to publish in volume form “the material of his Lowell Lectures 1924–25.” No mention was made of slight expansions (or added chapters). Possibly Whitehead was misinformed; possibly slight expansion was mentioned in an earlier, outdated contract; anyhow, it was customarily allowed.

\textdagger It will be discussed in Section iii of Chapter IX.
could not be included within that lecture course.’’ In his letter of July 9 he wrote:

I have completed the book so as to carry out the full scheme of thought which was curtailed for these [Lowell] lectures, . . . The whole makes a continuous train of thought, and the previous history of the material does not mean that the scheme lacks unity—at least in my mind.

Thus Whitehead believed that the parts of the book hung together. His assertion of a continuous train of thought might be taken to imply the absence of any doctrinal additions or changes. I should not, however, be willing to go to the stake for taking his language so strictly. He may have intended little more than assurance to Macmillan that they were not getting a hodgepodge. Still, some weight must be given to Whitehead’s belief in the unity of his book. It is hard to say how much; few authors are willing to admit that their manuscript lacks unity. It is pretty certain that during his first half dozen years in America Whitehead’s thought was always on the move, and this movement generally expanded or made more explicit what had been vaguely in his mind.*

There are different degrees of vagueness, and the degree got diminished by his effort to explain his ideas to his Harvard and Radcliffe classes in 1924–25.

*That is how he put it when I asked him about his early entertainment of ideas that he wrote up later.
The announcement of the Lowell Lectures\textsuperscript{19} said that they would include some comment on Tolstoy, Ibsen, and Bernard Shaw in the discussion of literature and science, but their names do not appear in \textit{Science and the Modern World}. As the Preface noted additions to the Lowell Lectures but not omissions from them, I infer that Whitehead did not mention these writers. I think that he was too busy finding the best verbalization of his new philosophy to have time to compose incisive comment on Tolstoy, Ibsen, and Shaw. Besides Wordsworth and Shelley, he had used Pope and Tennyson to show the effects of Newtonian science on literature. Those effects were what he wanted to bring out; enough was enough.

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In the mid-1920s there was a fair expectation, most widespread in America, that the gulf between the science of matter in motion and our experience of value could be bridged by a philosophical scientist of sufficient genius. \textit{Science and the Modern World} sold like hot-cakes.*

The Cambridge University Press was taken completely by surprise. The Secretary to its Syndics, S. C. Roberts, wrote:

\begin{quote}
We ordered five hundred copies in sheets [from Macmillan] and soon realised that it was a ludicrous miscalculation. The work was hailed as the most important contribution to its subject since Descartes, and we hastened to set up our own edition, which was many times reprinted.\textsuperscript{20}
\end{quote}

From Roberts's successor, R. W. David, I learned in 1968 that over the years Cambridge had sold more copies of \textit{Science and the Modern World} than of all of Whitehead's other books combined.\textsuperscript{21}

A book in which a new philosophy is heralded is likely to be more ardently welcomed than the definitive statement of that philosophy. And \textit{Science and the Modern World} was the right length: substantial, but not oppressively so. When \textit{Process and Reality: An Essay in Cosmology} was published four years later, it was found to be too intricate and many-faceted for popularity.

Macmillan was not the only American publisher that wanted White-

\footnote{As my own case was not unusual, I mention it. \textit{Science and the Modern World} was one of the two books that led me, a person who had received only an engineering education, to take up the study of philosophy. The other was Will Durant's popular \textit{Story of Philosophy}. The Whiteheads were much amused when I told them this.}
head’s Lowell Lectures. The Harvard University Press tried to get them, and almost succeeded.* Sometime in the autumn of 1924 Ellery Sedgwick, editor of the *Atlantic Monthly* and top-drawer in Boston, invited Whitehead to publish the Lowell Lectures in the *Atlantic* before turning them into a book. On November 16 Whitehead sent a reply that began with honest encomiums, then raised the points that were important to him: “absolute freedom” to publish later as a book, and *no delay* of the book “until all the lectures have gone through the magazine.” In the end, Sedgwick got none of the Lowell Lectures, only the Phillips Brooks Lecture “Religion and Science.”

vii

The desire to reconcile opposed parties rather than to champion one of them has appeared in my account of Whitehead’s life as an essential trait of his character. The same trait appears in his reaction to competition among world-views. In the Preface to *Science and the Modern World* he tells us that in the past three centuries the cosmology derived from science has asserted itself at the expense of those derived from ethics, aesthetics, and religion. The pursuit of science is praiseworthy, and indispensable to civilization, but Whitehead does not want it to run away with us. One of the important functions of philosophy, he says, is to criticize cosmologies,

to harmonise, refashion, and justify divergent intuitions as to the nature of things. It has to insist on the scrutiny of the ultimate ideas, and on the retention of the whole of the evidence in shaping our cosmological scheme. Its business is to render explicit and—so far as may be—efficient, a process which otherwise is unconsciously performed without rational tests.22

The championing of science, notably in the last hundred years, has seldom been expressed in terms of cosmologies; it has most often taken the form of insistence that the scientific method is the right way, and the only right way, to deal with situations. As first developed in the natural sciences, its hallmarks are isolation of a problem, careful observation, framing and exploring hypotheses in the imagination, and testing by repeatable experiments. In everyday life and in the social sciences, the isolation of the problem is made urgent by a feeling of need to change a situation that is being experienced as not good. In *Science and the Modern World*
World Whitehead does not explicitly discuss the claim to sovereignty made on behalf of this method. The claim was most often advanced in America, where it seemed highly appropriate to the reign of technology. But Whitehead was an Englishman and a mathematician, and old-fashioned enough to ponder "the nature of things." It would be natural, but mistaken, to think that proponents of the scientific method are less dogmatic and more flexible in outlook than proponents or opponents of scientific materialism as a cosmology. Who is less open to persuasion than the man who says, "There are many cosmologies and anyone is free to frame another, but I show you how to think, the only way that leads to sound conclusions about anything"?*

VIII

Whitehead entitled the last of his series of eight Lowell Lectures "Requisites for Social Progress."† In it his wisdom stands out. I shall call attention to only a few highlights.

No sooner has he reminded his audience that in the philosophy which he has sketched organism takes the place of matter, than he declares, "An organism is the realisation of a definite shape of value."23 Since he is convinced that everything in nature is such a realization, it would be correct to call his new philosophy of nature a "pan-valuism," however clumsy that label is.

In the nineteenth century scientific materialism and the manufacturing system became partners; when the assumption that matter in itself is devoid of value was taken seriously, much ugliness was produced.

Whitehead brings the idea of value into every topic he discusses in this lecture. An example is the need to balance specialist with general education. He had touched on this in more than one of his essays on education. Now he describes the kind of general education that is needed, needed most of all in a civilization that has been shaped by scientific materialism.

*The preachers of scientific method were riding high during the years that Whitehead taught philosophy at Harvard. Most of them were liberal social philosophers dedicated to reform. Only a few had an active interest in physical science, and none wanted to reduce cultural to material realities. The important point to all of them was: no recognition of any road to knowledge that is essentially different from the experimental road of the scientist. The philosopher they admired most, John Dewey, urged all philosophers to keep their thoughts inside problem-solving human situations and to stop theorizing about what he called "antecedent reality." Thus Whitehead's preoccupation with cosmology was ruled out. See John Dewey, The Quest for Certainty (New York: Minton, Balch & Co., 1929), passim.

†It was printed as the last chapter in SMW.
The type of generality, which above all is wanted, is the appreciation of variety of value. . . . What is wanted is an appreciation of the infinite variety of vivid values achieved by an organism in its proper environment.\textsuperscript{24}

A simple illustration follows.

When you understand all about the sun and all about the atmosphere and all about the rotation of the earth, you may still miss the radiance of the sunset. . . . What we want is to draw out habits of aesthetic apprehension.

The last sentence conveys the requisite that Whitehead thought most imperative. If you wonder whether he was undervaluing the understanding he had learned and had taught in comparison with the apprehension that Evelyn possessed to a high degree, you may be relieved by noticing Whitehead’s next illustration: the values involved in a factory.

Our attitude toward adventure and tradition is crucial. Whitehead wrote:

There are two principles inherent in the very nature of things, recurring in some particular embodiments whatever field we explore—the spirit of change, and the spirit of conservation. There can be nothing real without both.\textsuperscript{25}

Whitehead had long been convinced of this necessary duality; he would dwell on it at length in \textit{Adventures of Ideas}. Now he emphasizes the side that was most important to Evelyn. The human soul, he declares, cannot endure monotony; it needs to be “fertilised” by transient but vivid experiences; art meets this need.\textsuperscript{26}

The late nineteenth century found out how to train men whose knowledge would be professional, that is, thorough and progressive within its limits, and supported by a lesser knowledge of neighboring subjects. Whitehead wrote:

This situation has its dangers. It produces minds in a groove. . . . Now to be mentally in a groove is to live in contemplating a given set of abstractions. The groove prevents straying across country, and the abstraction abstracts from something to which no further attention is paid. But there is no groove of abstractions which is adequate for the comprehension of human life.\textsuperscript{27}

Because our life moves at a faster pace than formerly, professionalism has to be handled by greater wisdom.
Let us recall that when Whitehead wrote to his friend Mark Barr on January 13, 1924, about his interest in a possible offer from Harvard, he mentioned the opportunity to develop his ideas on education.* Now, in this last of the Lowell Lectures, he tells us what he most wants in education.

Wisdom is the fruit of a balanced development. It is this balanced growth of individuality which it should be the aim of education to secure. The most useful discoveries for the immediate future would concern the furtherance of this aim without detriment to the necessary intellectual professionalism.28

The “without” clause reminds me that, though Whitehead was never content with things as they are, he kept an eye open for ongoing values.†

ix

Whitehead’s new philosophy of nature had to be congenial to twentieth-century physics; so he devoted one chapter to the theory of relativity, and one to quantum theory. I do not see how in his first year at Harvard, what with his teaching, other academic duties, the Lowell Lectures, and social obligations, he could have any time for fresh scientific work. But in 1925, popular interest in the theory of relativity was strong. Whitehead could, and did, explain what Einstein had done, and the divergence from Einstein that he had presented in his Enquiry. He made no references to his formidable Principle of Relativity, and even said of the theory of extensive abstraction as it appeared in the Enquiry that it was “too technical for the present occasion.”29 There are no mathematical formulae in Science and the Modern World. For a Lowell Lecture audience, Whitehead thought it best to use words only. That increased the time it took to write the book, but much increased its appeal and its sale in bookstores.

The main difference that I find between the chapter on relativity and the treatment Whitehead gave the subject in his earlier books is the change, already remarked in Section iii above, from the mere relatedness of events in an extended continuum to the realization of an event as aprehensive unification of other things.

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*See page 134 above.
†The exception is his blind eye toward the need for keeping uniform external examinations in the school system of a democratic state; see page 45 above.
A point that must be borne in mind is that whereas orthodox relativity theory deals with external relations between objects, Whitehead’s theory concerns internal relations between events.

What Whitehead calls “the epochal theory of time” is announced in the chapter on relativity. Nothing whatever can be realized in an instant; a duration is needed. So Whitehead conceives time not as a form of extensiveness but as a succession of durations. Each duration is the epoch, or arrest, required for a particular realization. This doctrine of the atomicity of time or—to express it in a way that avoids possible misunderstandings—atomicity of process, is hereafter a fixture in the cosmology Whitehead is developing.

In his unusually short chapter on the quantum theory—it and the relativity chapter were presented in one Lowell Lecture—Whitehead’s main purpose is to show that the new discontinuities were wholly embarrassing to the old materialism but not to his new philosophy of nature, which provides a natural context for them.

None of Whitehead’s writing is as dated as his treatment of quantum theory. The second half of the 1920s was a wonderful period of new developments by the physicists. Science and the Modern World was just a little too early to take it into account. Whitehead names no one, but his discussion fits the atom depicted in Bohr’s early work.

I must doubt that he would have been much interested in responding to the newer developments; certainly not in any but very general terms like those he would use in Process and Reality. He had left the world of equations behind him and become a philosopher. At Harvard, Whitehead could leave mathematical physics to others, while he tried out his metaphysical ideas and dispensed wisdom.

X

In the Preface to Science and the Modern World, Whitehead tells the reader not to expect any discussion of epistemology, as that would have upset the balance of the work. In sketching his alternative to scientific materialism, he started from the perceptual field, and took it “for what it claims to be: the self-knowledge of our [total] bodily event.” Here an epistemological justification was desirable.* Whitehead simply con-

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*Whitehead introduced what I have quoted with the statement, “I have started from our own psychological field, as it stands for our cognition” (SMW, p. 103). This way of putting the matter—he frequently uses “as it stands” or synonymous phrases—eases the reader into the assumption that the cognitions in question are trustworthy.
tinues to draw on well-known general facts of psychology and physiology.

When he has finished sketching his organic conception of the world, he says that it is "equally possible" to arrive at it if, instead of starting from psychology and physiology, we start from "the fundamental notions of modern physics," and that this was the path he actually followed. However, he does not identify his starting point or narrate the steps of his reasoning. He says only that it was "by reason of my own studies in mathematics and mathematical physics" that he arrived at his convictions. That tells us as little as possible. His next statement, "Mathematical physics presumes in the first place an electromagnetic field of activity pervading space and time," gets our hopes up, for we remember that Maxwell's *Electricity and Magnetism* was the subject of Whitehead's Trinity College fellowship dissertation.* But in the four pages which follow, on the abstractions that mathematical physics makes and on its analysis of an event in empty space, there is no reference to Whitehead's actual train (or trains) of thought.

That negative fact should not surprise us. In this biography we've often seen how little its subject was interested in himself. Most people talk too much about themselves. Whitehead seldom tells you just what *he* did. This type of reticence made him a better man, though a more difficult one to write about. It is fortunate that in England his work was in pure mathematics, not in experimental science. His role in America was that of a teacher who proposes systematic hypotheses to explain what's there for anyone to observe.

**xī**

In the four pages on mathematical physics which I referred to, Whitehead makes a logical blunder. After saying that physics ignores what anything is in itself, and considers only extrinsic realities, he asserts that physics presupposes "the organic theory of aspects." "The organic theory" means Whitehead's, as making organisms basic instead of particles of matter. *Aspect* is the most overworked word in *Science and the Modern World*. Whitehead is always insisting that every event—indeed, every thing, of whatever type—enters into the being of other things. Thus an aspect of the object seen there is present here. Let it be

*See Volume I, pages 106–8.*
granted that physics abstracts from the total character of its objects. You may then enclose physics in your own theory about intrinsic realities and their partnership with the extrinsic. This will not prove that physics presupposes your theory.

In the later *Process and Reality*, where the account of presence elsewhere is detailed, the vague word *aspect* is not used. Whitehead’s addiction to it in *Science and the Modern World* tells us that his philosophy will develop beyond that book. His language was loose because his thoughts were not yet firmly organized. And he said, “It is obvious that so-and-so,” when so-and-so is not obvious to us. Whitehead was expert in making general statements; many of the statements in the exposition of his new philosophy of nature are highly general because he hasn’t got around to making the necessary distinctions. He writes vaguely of “a selective activity which is akin to purpose.” In later books he will specify the kind of teleology he wishes to defend.

xii

Whitehead’s acknowledgments in the Preface to *Science and the Modern World* are sparse: he has found Lloyd Morgan’s *Emergent Evolution* and Alexander’s *Space, Time, and Deity* “very suggestive”; but then he says, “I am especially indebted to Alexander’s great work.”

Samuel Alexander, two years younger than Whitehead, was an Australian who came to Oxford at eighteen. Idealism was then the dominant philosophy there; its influence was evident in his first book, *Moral Order and Progress*. But he soon became more interested in philosophy’s dependence on the empirical sciences; he studied psychology for a year at Hugo Münsterburg’s laboratory in Freiburg, Germany. Espousal of a realistic epistemology in a long series of articles was followed, when he was Gifford Lecturer at Glasgow in 1916–18, by a realistic metaphysics. These lectures, as published in two volumes with the title *Space, Time, and Deity* in 1920, were his major work. It was acclaimed in England and America, but is now even less popular than Whitehead’s *Process and Reality*. In 1924, the year in which Whitehead went to Harvard, Alexander retired from the chair he had long held at Manchester. He died in 1938.

In Whitehead’s old age he told me that Samuel Alexander was the philosopher of his time from whom he got most. But he gave me no details, saying only that he and Alexander “conceived the problem of metaphysics in the same way,” that is, as reconciliation of the unity of
the universe (emphasized in Spinoza’s metaphysics)* and the multitude of individuals (emphasized by Leibniz).

Whitehead also remarked to me that Alexander, almost alone among their British contemporaries, did not, implicitly at least, assume that our experience is basically an experience of sense-data. Perception, for Alexander, consisted in the “compresence” of an object and a subject who “enjoys” a “togetherness” with the contemplated object. This is not far from Whitehead’s notion ofprehension. Both men found activity and value pervading nature. If time allowed, I could single out and analyze several other similarities. This would not prove that Whitehead derived the doctrines in question from Alexander, but only suggest that he might have done so, had he himself no power of original thought and expression. I prefer to confine myself to what can safely be made out.

In a period when the endeavor to construct a general theory of existence was unfashionable, the production of Alexander’s grand system could only encourage Whitehead to try his hand. He did not agree with the hypothesis of Alexander’s Giffords—the “Space-Time is the stuff of which matter and all things are specifications.”39 But the checkmarks, scorings, and detailed comments in Whitehead’s copy of Space, Time, and Deity, which he read in 1924, show that he liked many of the points Alexander made and the purport of most of the work, while the question marks that Whitehead scrawled in the margins show in what respects Alexander failed to convince him or was not definite enough.

Probably Whitehead read Alexander’s major work before he left England, for many of his comments express points he would want to bear in mind when he was concerned with the second edition of his Enquiry. (The Preface to that edition is dated August 1924.)

Alexander’s way of presenting his philosophy appealed to Whitehead. As John Passmore said of Alexander,

he simply puts a hypothesis before us and then tells us to look and see how reasonable it all is, how admirably it squares with our experience. He does not exhort us, he does not argue with us, he merely bids us cast off our sophistication.40

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*Alexander felt close to Spinoza. His lecture, “Spinoza and Time” (London, 1921), makes their relationship clear, while substituting Time for Thought in Spinoza’s theory of Attributes.
Passmore also wrote,

In his “Some Explanations” (Mind, 1921), Alexander goes so far as to assert that he dislikes arguments, a strange pronouncement from a philosopher.\(^\text{41}\)

That would indeed have been a strange pronouncement from a run-of-the-mill philosopher, who does nothing but argue about the soundness of the arguments that fellow philosophers are using. But Alexander was not a run-of-the-mill philosopher. Like Whitehead, he was able to offer new initial premises.

In a passage that Whitehead marked in his copy of *Space, Time, and Deity*, the author, explaining that in his remarks on the interconnection of time and space he was not trying to prove the existence of space, wrote, “There is no room for ‘must’ in philosophy or in science, but only for facts and the implications of them.”\(^\text{42}\) How different this man was from Bertrand Russell! In place of Russell’s hard, logical atomism there was a judicious chapter on “The One and the Many.” Reading Alexander’s philosophy instead of Bertie’s must have been a great relief to A. N. W.

To Russell in this stage of his career, a very few epistemological principles (as well as all those of logic) were prior to metaphysics. But when Whitehead began his plunge into metaphysics in *Science and the Modern World*, he said that

> an account of the general character of what we know must enable us to frame an account of how knowledge is possible as an adjunct within things known.\(^\text{43}\)

To Alexander also, theory of knowledge was not the foundation of metaphysics, as so many believed, but only a chapter of it.\(^\text{44}\)

Early in his second volume, Alexander wrote that the relation of a conscious subject to the object which transcends it is not unique, but is “found wherever two finites are compresent with each other.”\(^\text{45}\) In his copy, Whitehead underscored this and wrote “Yes” in the margin. Neither man believed that consciousness was omnipresent; my suggestion is that Whitehead sympathized with Alexander’s generalization of the subject–object relation. When Whitehead started to develop his metaphysical system, he would deal primarily with the transition from object to subject, and the concrescence of the subject. There is none of this in *Space, Time, and Deity*. But the idea of process—natural process and history, nothing Hegelian—is there, and is emphasized. Alexander speaks of a “nisus” in Space-Time.
Alexander was weakest in his treatment of point-instants as units of reality; Whitehead had done better with point-instants. Alexander had read his books on the philosophy of physics, and lamented his own lack of mathematical training. Further, he confessed to having a feeling of presumptuousness in writing about Space-Time without having the proper equipment. There is quite a contrast between his treatment of Space-Time as “the empirical reality” and Whitehead’s treatment of it as a continuum of abstract potentialities for the finite processes that are his empirical realities.

*Space, Time, and Deity* is divided into four Books; Deity is the subject of the last. In Whitehead’s copy, the first three books are full of his marginalia, but there is not a single mark in Book IV.

Alexander’s subject was not God, but the quality of deity. He identified it as, for us, “the next higher empirical level than mind.” Samuel Alexander had a Victorian’s fascination with the idea of evolution from one level of existence to the next higher level. Following Lloyd Morgan, he called the higher level “emergent,” a term which implies novelty and contrasts with “resultant.”

Whitehead’s thought was not restricted to the levels of existence on this little planet of ours. He liked Alexander’s idea of a nisus in Space-Time, but did not limit the applications of what corresponded to it in his metaphysics. The God that he had introduced to his readers in *Science and the Modern World*, and later called God in his primordial nature, was, as he remarked in 1931, “Alexander’s nisus conceived as actual.”

Alexander based his thought about the quality of deity on his conception of the religious sentiment in mankind. I think Whitehead’s interpretation of the religious sentiment was ampler.

With the notable exception of Whitehead himself, more students of his philosophy bestow the honor of first place among its progenitors upon Bergson than upon Alexander. In particular, the primacy that Whitehead gave to the idea of process is usually assumed to be due to Bergson’s influence on him. But what is the idea of process? Only Whitehead’s idea of process is in question. When we go afield, we

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*Emergent* was introduced by G. H. Lewes in the late 1870s.

†See pages 196–97 below.
might better—I shall not try to settle the question—consider the idea that Alexander expressed by “Motion”\(^{48}\) to be closer to Whitehead’s “process.”

In his London years Whitehead enjoyed opportunities to be influenced by Bergson. He often chatted with his Aristotelian Society friend H. Wildon Carr, who had published a book on Bergson’s philosophy in 1911.\(^{49}\) And Jessie Whitehead told me that she remembered at least one occasion when Bergson was in her parents’ house.\(^{50}\)

Belief in a substantial Bergsonian influence mushroomed after a reviewer of the *Principles of Natural Knowledge*, Theodore de Laguna, wrote:

> Mr. Whitehead seems to have felt very keenly the force of Bergson’s criticism of natural science as incapable of expressing the continuity of things. . . .

> . . . the ulterior aim of his whole work is to reform science so that it shall no longer be open to such criticism.\(^{51}\)

The very long review in *Mind*, written by a friend of Whitehead’s, C. D. Broad, did not assert an ulterior aim, nor mention Bergson. And the author, Whitehead himself? He put two references to Bergson into the book. In the Preface he named him as one of seven philosophers who “have initiated and sustained relevant discussions.” This is not followed up. The other reference is in the concluding paragraph. Since it reveals Whitehead’s feelings about life and death as well as his response to Bergson’s philosophy, it deserves quotation:

> So far as direct observation is concerned all that we know of the essential relations of life in nature is stated in two short poetic phrases. The obvious aspect by Tennyson,

> Blow, bugle, blow, set the wild echoes flying,

> And answer, echoes, answer, dying, dying, dying.

> Namely, Bergson’s elan vital and its relapse into matter. And Wordsworth with more depth,

> The music in my heart I bore,

> Long after it was heard no more.

Identification of Bergson’s doctrine with the obvious does not suggest that Whitehead is accepting it. Quite the contrary; it suggests that Whitehead wants more insight than Bergson offered. When I asked him about de Laguna’s interpretation of the *Principles of Natural Knowledge*, he replied that he had read Bergson but was not much worried by him.\(^{52}\)

In *Science and the Modern World*, a note of sympathy is struck in
Whitehead’s comment on Bergson’s “so-called anti-intellectualism.” He says that it should be construed as “a protest against taking the Newtonian conception of nature as being anything except a high abstraction.” That would make Bergson an ally in Whitehead’s attack on scientific materialism. Now, Bertrand Russell had often tried to nullify Bergson’s philosophy. The criticisms were not distinguished; they relied on such obvious stratagems as fastening on Bergson’s distrust of the intellect and turning it against him.

To me, Whitehead’s comment was quite in character for him. It may be counted as an episode in the long story of his varied relations with Russell.* Russell’s friends thought of him as the great Destroyer in arguments. To Whitehead, many roads led toward truth. Why not be hospitable to a new traveler? In philosophy, we are all groping, and no one owns the whole truth.

Back to the question of Bergson’s influence on Whitehead. We saw earlier† that in February and March 1885, when Bergson had not yet published any of his philosophy, Whitehead as a young “Apostle” rejected what Bergson later called the “spatialization” of change.

Nobody should say that the Bergsonian influence on Whitehead can hardly be exaggerated. Of course it can be exaggerated. It is all too easy for the well-read Ph.D., on looking at a new philosophy, to say, “I know where he got this idea! and that one! and that one!” The gain is that he need not sweat long over a new idea if he misreads it as only a new version of one he knows.

Fortunately, it is hard to do this with the Bergson-Whitehead relation: the contrasts are too strong. In all of Whitehead’s books from *Science and the Modern World* on, it is evident that his way of thinking, adventurous and systematic, defies Bergson’s exhortation,

> Let us have done with great systems embracing all the possible, and sometimes even the impossible! Let us be content with the real, mind and matter.55

I once made a study, “The Influence of Bergson, James, and Alexander on Whitehead.” More than half of it was devoted to the alleged influence of Bergson. As influence is a causal connection, I explored the possibility that Whitehead derived from Bergson either his choice of problems to investigate or some essentials of his solutions to them. My

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*Whether or not Russell used the term *anti-intellectualism* in describing Bergson’s philosophy, that is the ism which Russell’s readers attached to his victim.
†Volume I, pages 136–38.
conclusions (tentative, not final) were negative.\textsuperscript{57} To that study I refer readers who believe that Whitehead’s philosophy was influenced by these men.

\textit{xiv}

The Macmillan Company of New York almost lost the right to publish Whitehead’s Lowell Lectures of 1925. As Curtice Hitchcock of Macmillan tells the story, in the autumn of 1924 a man from the Harvard University Press “made some rather vague remark to Whitehead who didn’t immediately connect it with Lowell Lectures.”\textsuperscript{58} Harold Murdock of the Harvard Press then made arrangements with Evelyn Whitehead to have Harvard publish those lectures.\textsuperscript{59} But acting as her husband’s business manager, Evelyn got the right to publish back into Macmillan’s hands.

From Sydney Roberts, Secretary to the Syndics of the Cambridge University Press, Hitchcock learned that Cambridge never had a written contract with Whitehead for any of his books that they published. Roberts told him, “Whitehead always has his head above the clouds and is perfectly incapable of transacting business in a definite fashion.”\textsuperscript{60} And it was useless to write him, because he never answered letters.\textsuperscript{61}

To Whitehead, preparing his lectures, performing other academic duties, and developing his mathematical or philosophical ideas always took priority over other kinds of activity. Social obligations outranked business, which came last.

Early in May 1925 the manager of Macmillan’s New England branch, F. J. Flagg of Boston, was asked to discuss business with Whitehead. After many attempts he managed to see him. As Flagg wrote to Hitchcock, “This was entirely unsatisfactory. He apparently knows no more about business than a child. He finally referred me to Mrs. Whitehead.”\textsuperscript{62}

Evelyn was more than willing to talk business with Mr. Flagg. She told him that, frankly, she would prefer Cambridge in England and Macmillan in America to any other publisher of her husband’s books. Their finances, she said, had been hit hard by the war; it was imperative that they realize as much as possible from the new manuscript. An American publisher had offered a royalty of 55–60 percent. Evelyn added that she was negotiating with the Cambridge University Press for a uniform edition of her husband’s works; if Cambridge was willing to go ahead with this, she was disposed to give them the new manuscript despite the flattering offer of such a high royalty.\textsuperscript{63} Evelyn did not
identify the generous American publisher. Hitchcock immediately wrote Flagg that Mrs. Whitehead must mean 55 percent of the profits, not a 55 percent royalty on copies sold at retail; that was something no publisher could afford to offer.\textsuperscript{64}

The final upshot concerning \textit{Science and the Modern World} was that on June 25, 1925, Whitehead signed a contract; Macmillan was to give him a 15 percent royalty and, on receiving the manuscript, an advance of $250 against the royalties. These terms were not unusual; in fact, Macmillan and the Cambridge University Press had agreed on the 15 percent royalty the summer before. When Hitchcock wrote to Whitehead on July 1, 1924, expressing Macmillan's desire to publish Whitehead's Lowell Lectures, he also wrote to the Cambridge Press, saying that Macmillan wanted to be sure of having the American rights. Both Whitehead and Cambridge seem to have assumed that Cambridge would continue to be his publisher, in the old easygoing way, after his migration to America. Whitehead did not answer Hitchcock's letter, but Cambridge made an offer, which Macmillan accepted, for the American rights to publish these Lowell Lectures at a royalty of 15 percent of the American published price.\textsuperscript{65} The book was to be manufactured in the United States, and Macmillan would put it on the market.

This practice was followed with Whitehead's later books.* Cambridge would produce the best editions. But in every case the author's financial agreements were with Macmillan.

\textsuperscript{*}However, see the first sentence of Section ii of this chapter, and the footnote attached to it.