Morris was one reason Dewey became interested in education. Chicago was another. Dewey was ambivalent about the university, but he loved the city. "Chicago is the place to make you appreciate at every turn the absolute opportunity which chaos affords," he wrote to Alice less than two weeks after arriving: "—it is sheer Matter with no Standards at all." Six weeks later, he expanded on his impression:

Every conceivable thing solicits you; the town seems filled with problems holding out their hands & asking somebody to please solve them—or else dump them in the Lake. I had no conception that things could be so much more phenomenal & objective than they are in a country village, & simply stick themselves at you, instead of leaving you to think about them.... [Y]ou can’t really get rid feeling here that there is a "method" & if you could only get hold of it, things could be so tremendously strengthened out; it’s such a loose jointed quantitative chaos after all,—and not an Ann Arbor parterre. Think of all hell turned loose, & yet not hell any longer, but simply material for a new creation.61

It is like Albion Small’s notion of the city as a laboratory. Chicago seems to have struck the social-scientific mind at the end of the nineteenth century as an animated simulacrum of social life, a sort of living textbook. Max Weber, passing through the city in 1904, compared it to a man whose skin has been peeled off so that you can see the intestines working.

A third ingredient was regular exposure to Hull-House; and by November of 1894, Dewey had his vision. He wrote it down in a letter to Alice that expresses (in language several degrees more excited than he used again) all the essential elements in his philosophy of the school. "I think I’m in a fair way to become an educational crank," he wrote:

I sometimes think I will drop teaching phil—directly, & teach it via pedagogy. When you think of the thousands & thousands of young uns who are practically being ruined negatively if not positively in the Chicago schools every year, it is enough to make you go out & howl on the street corners like the Salvation Army. There is an image of a school growing up in my mind all the time; a school where some actual & literal constructive activity shall be the centre & source of the whole thing. & from which the work should be always growing out in two directions—one the social bearings of that constructive industry, the other the contact with nature which supplies it with its materials. I can see, theoretically, how the carpentry etc involved in building a model house should be the centre of a social training on one side, & a scientific on the other, all held within the grasp of a
positive concrete physical habit of eye & hand. . . . The school is the one form of social life which is abstracted & under control—which is directly experimental, and if philosophy is ever to be an experimental science, the construction of a school is its starting point—This general theorizing is very edifying when our own children can't get even a poor school to go to; but it's largely that that has started me off—with the pleasure of being with an absolute normal intelligence like Morris's. 52

A little more than a year later, in January 1896, Dewey opened the University Elementary School of the University of Chicago. The school had sixteen children, all under twelve, and two teachers. It was a local sensation. That fall, it reopened in a new space with three teachers and thirty-two students. By 1902, there were 140 students, twenty-three teachers, and ten graduate students working as assistants; it had become an international sensation; and it was known as the Dewey School.

The official name the school eventually acquired was the Laboratory School. The name actually came from the school’s supervisor of instruction, Ella Flagg Young (who later became superintendent of the Chicago school system), but it expressed Dewey’s intention exactly. The Dewey School was a philosophy laboratory, in the same way that Hull-House was a sociology laboratory. It was a place, as Dewey later put it, “to work out in the concrete, instead of merely in the head or on paper, a theory of the unity of knowledge.” 53

Morris Dewey, Jane Addams, and the city of Chicago represented a set of influences unique to Dewey. From a professional point of view, though, the move into education was a perfectly natural career development. As Stanley Hall, with his customary shrewdness, had realized back in the early 1880s, the theory and practice of education was a sensible application for a discipline, like the New Psychology, in search of legitimacy. Hall’s own work was principally in pedagogy and developmental psychology. (He became identified with the recapitulationist theory—derived, of course, from German sources—which he first advanced in his Harvard lectures: that the child’s intellectual development repeats the development of the species. Hall called this “the general psychonomic law.”) And William James, two years after the appearance in 1892 of his Principles of Psychology, gave a series of lectures on education that were published in 1899 as Talks to Teachers on Psychology and became one of James’s most popular books. Two of the leading American figures in the field of educational research after the turn of the century, James McKeen Cattell, of Columbia University, and his student Edward L. Thorndike, of Teachers College, were trained as experimental psychologists. Cattell took his Ph.D. under Wundt in Leipzig; Thorndike, before transferring to Columbia, had begun his dissertation (on learning curves in chickens) with James at Harvard. (When Thorndike was refused space for his chickens in the Agassiz Museum, James housed them in his cellar.) As an academic psychologist, Dewey was applying his expertise in the approved way.

The condition of American elementary education was also a leading public issue in 1896, and for a philosopher to be engaged with it was hardly eccentric. The United States Commissioner of Education was William Torrey Harris, who also happened to be the leading American Hegelian and founder and editor of the Journal of Speculative Philosophy, where Dewey had published his first essays. In 1892 and 1893 a series of investigative articles on American schools by a New York pediatrician named Joseph Mayer Rice, published in the Forum (one of the magazines that would reject “A Modern Lear” three years later), had drawn national attention. Before touring the United States and examining its schools, Rice had spent two years studying pedagogy in Germany, in Jena and Leipzig. He was, not surprisingly, appalled by the lack of psychological sophistication in the rote approach to learning that dominated American elementary education. (He was appalled by many other things as well, including the political corruption in many school districts.)

One of the few schools Rice found it possible to praise was near Chicago. This was the Cook County Normal School, in Englewood, whose principal was the same Colonel Francis Parker whose work in the Quincy schools Hall had talked about in his Harvard lectures. Parker, too, had learned his pedagogy in Germany, and his “Quincy System” was distinguished by the hands-on approach: the use of
manipulatives (like blocks) to teach arithmetic, for example, or field trips to teach geography. Parker created a teacher training program at the Cook County Normal School based on his system, and in his first semester at Chicago Dewey gave a university extension course there on psychology. He was impressed by what he saw—he had just returned from giving one of those lectures, in fact, when he wrote his wife the letter of November 1894 announcing his inspiration.

Dewey didn’t conceive of his school as a teacher training institute, though, and he didn’t conceive of it as a psychology laboratory, either. He conceived of it as a philosophy laboratory. Dewey wasn’t conducting curricular experiments or collecting data on mental development. He was trying out a theory. It was a theory, as he said, of “the unity of knowledge.”

The phrase “unity of knowledge” echoes James Marsh and George Morris, and the passion for holism that inspired their philosophies of education—their idea that every subject should be taught as an aspect of a greater whole—was certainly inherited by Dewey. But in Marsh and Morris that idea was metaphysical in Huxley’s sense: it rested on a belief that the ultimate whole was an extrasensory entity—the divine will, or the Absolute. It belonged to the German idea of Bildung, education as growth toward the apprehension of a spiritual oneness. This part of his inheritance Dewey now rejected.

By “unity of knowledge” Dewey did not mean that all knowledge is one. He meant that knowledge is inseparably united with doing. Education at the Dewey School was based on the idea that knowledge is a by-product of activity: people do things in the world, and the doing results in learning something that, if deemed useful, gets carried along into the next activity. In the traditional method of education, in which the things considered worth knowing are handed down from teacher to pupil as disembodied information, knowledge is cut off from the activity in which it has its meaning, and becomes a false abstraction. One of the consequences (besides boredom) is that an invidious distinction between knowing and doing—a distinction Dewey thought socially pernicious as well as philosophically erroneous—gets reinforced.

At the Laboratory School, therefore, children were involved in workshop-type projects in which learning was accomplished in a manner that simulated the way Dewey thought it was accomplished in real life: through group activity. Since the project was being carried out in the present, and since it was supposed to proceed in accordance with the natural instincts of the children (“I think . . . that the development of the children’s interests will follow very closely a truly scientific development of the subject,”4 Dewey stated in one of his planning letters), what was learned was precisely what was useful. Relevance was built into the system.

One of Dewey’s curricular obsessions, for instance, was cooking. (Like all courses at the school, including carpentry and sewing, cooking was coeducational.) The children cooked and served lunch once a week. The philosophical rationale is obvious enough: preparing a meal (as opposed to, say, memorizing the multiplication table) is a goal-directed activity, it is a social activity, and it is an activity continuous with life outside school. But Dewey incorporated into the practical business of making lunch: arithmetic (weighing and measuring ingredients, with instruments the children made themselves), chemistry and physics (observing the process of combustion), biology (diet and digestion), geography (exploring the natural environments of the plants and animals), and so on. Cooking became the basis for most of the science taught in the school. It turned out to have so much curricular potential that making cereal became a three-year continuous course of study for all children between the ages of six and eight—with (on the testimony of two teachers) “no sense of monotony on the part of either pupils or teacher.”5 And as cooking established a continuity with the sphere of the home, other activities established continuities with the spheres of industry and business. There was much work, for example, with iron. The children built their own tiny smelters.

The pedagogical challenge, crucial to the theory, was to make the cemistry indivisible from the lunch, the learning indivisible from the doing. “Absolutely no separation is made between the ‘social’ side of the work, its concern with people’s activities and their mutual dependencies, and the ‘science,’ regard for physical facts and forces,”66
Dewey wrote in 1899 in his best-selling book about the school, *The School and Society* (a work that has never been out of print). This is one of the things Addams had meant when she told Alice Palmer that a social settlement "wasn't a thing but a way of living—hence had the same aims as life itself." And it is one of the things Dewey meant by "the unity of knowledge."

But "unity" had another connotation: it was the fighting term of functionalism. Most work in experimental psychology in the nineteenth century was predicated on the theories of two people who had never seen the inside of a laboratory, Locke and Kant. Kant had a more generous view of the mind than Locke, but he did not think of himself as superseding Locke's theory, only as correcting for a few inadequacies. A Kantian like Wundt therefore assumed that every mental state, no matter how complicated, can be broken down into simple bits of sense data that have been combined by the operation of various mental processes—perception, attention, cognition, discrimination, comparison, association, and so on. Wundt thought that the purpose of physiological psychology was to study these processes; and to study something meant for him (as it would for almost any nineteenth-century scientist) to measure it. When people came to work in Wundt's laboratory in Leipzig, that was what they did.

How exactly do you measure "attention"? The answer was: you time it. You place a subject in front of a screen and instruct him or her to press a key when a light appears, and then you record the time between the appearance of the light and the pressing of the key. The technical term for what you are measuring is the "reflex arc"—the sequence of sensory stimulus (the light), idea ("the light is the signal for me to press the key"), and motor response (pushing down on the key). Like many other nineteenth-century psychologists, Wundt believed that the reflex arc—sensation, idea, action—was the basic structure of all mental activity. It was, after all, perfectly Newtonian, a straightforward causal model—the billiard-ball picture of the mind.

When you measure the total time between a stimulus and a response, you are measuring more than an act of attention, of course. The total time also includes, for example, the time it takes for the brain's command to press the key to be transmitted through the nerves to the hand. So which portion of the time between the shining of the light and the pressing of the key is taken up specifically by attention (Wundt preferred the Kantian term "apperception")—that is, by picking up the stimulus and recognizing it as a signal to press the key?

The problem was addressed in 1888 by a psychologist working in Wundt's laboratory named Ludwig Lange. Lange instructed half his subjects to concentrate on seeing the light and half to concentrate on pressing the key. He found that the people who concentrated on what their hands were doing reacted about a tenth of a second faster than the people who concentrated on what they were seeing. He concluded that the extra tenth of a second was the time required to pick the light out from all the objects in the field of vision and interpret it as the signal to press the key—the time required for attention. (The experiment was virtually a reproduction of the study that was one of the origins of the New Psychology. Wundt's discovery of the difference between astronomical observers who look at the star first and observers who look at the instrument first. It is an indication of the glamour surrounding experimental psychology that Lange's finding was treated as a major scientific advance. It generated almost as much excitement as Gustav Fechner's earlier discovery that the intensity of a sensation (of brightness, say, or of weight) increases as the logarithm of the intensity of the stimulus—a principle Fechner believed comparable in significance to the law of gravity. Measuring reaction times became an academic industry.

One person unimpressed by the whole business was William James. Though he had once hoped to study with Wundt, by the time he came to write *The Principles of Psychology* James had lost all sympathy with the Leipzig approach—"brass instrument psychology," as it was known to its detractors. He thought Wundt a "Napoleon without genius," and he considered reaction time studies largely pointless. "It is a sort of work which appeals particularly to patient and exact minds," he noted drily in the *Principles*, "and they have not failed to profit by the opportunity." (Patience and exactitude were not, of course, James's most notable qualities.) James's assessment of Fechner's great discovery was more blunt: "in the humble opinion of the
present writer,” he says in the Principles, “the proper psychological outcome is just nothing.”

What irritated James most about Lange’s study was that in order to get uniform results showing the tenth of a second difference, the subjects were required to repeat the experiment many times. For in the beginning, as one would expect, reaction times were wildly inconsistent. Some people were good at it right away and some people had to repeat the sequence over and over in order to get their times down. James’s point was that after a large number of trials, Lange was no longer measuring attention, because the whole act had become a muscular reflex: see light, press key. What is genuinely an act of attention, James suggested, was what happens the first time the subjects pick out the light and press the key, before they become habituated to it. That’s when they really have to be paying attention. And first-time reactions are various because individuals are various. No general “law of attention” is possible.

Lange’s procedures were defended by the leading Wundtian in America, Edward B. Titchener, an Englishman who had written his thesis in Leipzig on reaction times and, in 1892, became professor of psychology at Cornell. Titchener thought getting individual differences out of the way was the obvious starting point for any scientific investigation. If you are looking for the underlying elements of psychic life, the basic structure of the mind, then you want to get past the accidental in order to reach the constant. In putting forward this position, Titchener became embroiled in a dispute with a Princeton psychologist, James Mark Baldwin, who claimed to have gotten reaction times that contradicted the Leipzig results, and who called himself a functionalist. A functionalist, according to Baldwin, is interested in what people do, not what is going on in their brains while they’re doing it. You cannot break an act up, as Wundt and Titchener believed you could, into so many distinct elementary processes. Behavior is a matter of the relation between the whole organism and the whole situation. (Thorndike would soon after make the same point with his chickens.)

The debate between Titchener and Baldwin became intense—the issue seems trivial, but they were arguing, in a sense, over the future of their discipline—and in 1895, James Rowland Angell undertook to mediate it. James Rowland Angell was the son of James Burrell Angell, who had been president of the University of Vermont when Dewey was growing up and president of the University of Michigan when Dewey was teaching there. James R. was a Michigan undergraduate, and in 1891, his senior year, he read The Principles of Psychology in Dewey’s class and became inspired. On Dewey’s advice, he went to Harvard to work with James, whom he came to consider “my spiritual father.” At Harvard, Angell decided he needed a German Ph.D. (though his father pointed out to him that “Dewey is proof that one can succeed without going abroad”); when he arrived in Leipzig, however, he found there was no room in Wundt’s classes. He went to Berlin instead, but accepted a position at the University of Minnesota, in 1893, before getting his degree. In 1894 Dewey brought him to Chicago. (The lack of a doctorate did not prevent Angell from becoming, many years later, the president of Yale.)

Along with a teaching fellow in the Chicago department named Addison Moore, Angell conducted a version of Lange’s experiment. The results partially confirmed both the “Leipzig” and the “Princeton” claims: individual times varied according to skill and experience, but after sufficient practice concentration on the physical response rather than the sensory stimulus generally yielded the faster times. They showed their results to Dewey and George Herbert Mead, and, after consultation (all of them were familiar, of course, with James’s criticisms of Lange’s original experiment), Angell and Moore composed an interpretation.

They said the obvious thing, which is that subjects concentrating on their response are “attending” just as much as subjects concentrating on the stimulus are. What, after all, is “attention”? It is what happens when we are performing an act that is not, or is no longer, habitual. For example, we don’t pay attention to the way we walk until we encounter an obstacle that makes walking in the normal, self-conscious way a problem. Attention, Angell and Moore said, is just “the process of mediating the tension between habit and new conditions,” and it therefore comes into play wherever “this tension is strongest, i.e., where habit is least able to cope with the situa-
tion. For most of the subjects in the experiment, picking up a stimulus becomes habitual more readily than producing a physical response, which is the real explanation for the tendency of the people focusing on their hands to get faster times: they're directing attention where it's most needed. Attention is functional. It is not a process measurable from the outside; it is something that falls "inside" the complete act. And the complete act is not composed of discrete units; the act is the unit.

Equipped with Angell and Moore's results, Dewey proceeded to write "The Reflex Arc Concept in Psychology," a very short, very technical paper, which he published in 1896 and never reprinted, and which is the key to his thought. To put it anachronistically but accurately: Dewey deconstructed the reflex arc. In the reflex arc's billiard-ball picture, a sensory stimulus (Dewey used the standard textbook illustration of a child seeing a candle flame) triggers an idea (for example: "This light might be amusing to play with"), which triggers a physical response (reaching out to touch the flame). There follows another sensation (of burning), another idea ("Get away from this light"), and another response (withdrawal of hand and concomitant symptoms of distress). But this account commits the empiricist's fallacy: it assumes that the parts are prior to the whole; when in fact it is the whole that makes the parts what they are. "[I]n its failure to see that the arc of which it talks is virtually a circuit, a continual reconstitution," Dewey said, the reflex arc theory "breaks continuity and leaves us nothing but a series of jerks, the origin of each jerk to be sought outside the process of experience itself."73

In other words, the reflex arc pretends to be a description when it is really just an ex post facto interpretation. "A set of considerations which hold good only because of a completed process," Dewey complained, "is read into the content of the process which conditions this completed result. A state of things characterizing an outcome is regarded as a true description of the events which led up to this outcome."74 Analytically speaking, the response actually precedes the stimulus—that is, we label the seeing a "stimulus" because we have already labeled another part of the act, the reaching, a "response." As Dewey provocatively put it: "The burn is the original seeing."75 For actions have goals built into them. The child wasn't seeing and then, as a separate act, touching; the child was seeing-in-order-to-touch. The correct way to picture an act is therefore not as a series of concatenating billiard balls, or as an arc, but as an organic circuit. It has to be indivisible before it can be divided.

The language of Dewey's paper is secular and Darwinian; it dissolves mental states into the unified biological activity of adapting to the environment. And his attack on the scientist's tendency to treat terms of inquiry as though they are real things derives from what James, in a passage in The Principles of Psychology, termed "the psychologist's fallacy."76 ("Let me say that I think the discovery & express formulation of this alone would have marked the book as 'epoch-making.'"77 Dewey said of this passage in his first fan letter to James.) And James's passage derives in turn from the thought of Charles Peirce and Chauncey Wright and St. John Green. But Dewey's idea of the priority of the complete act to any of its aspects is not found in James or Peirce, or even in Baldwin and the other functionalists. It has a very different source: it is an echo of Hegel's description of the realization of the Idea in history—the circle which presupposes its end as its purpose, and has its end for its beginning, [becoming] concrete and actual only by being carried out, and by the end it involves." The only thing missing is the Absolute. The "organic circuit" is biologized Hegel.

In fact, Dewey had used the metaphor of the organic circuit before he wrote the paper on "The Reflex Arc Concept," and even before he knew the results of Angell and Moore's experiment. It appears everywhere in his writings on the school. "There is a circuit in any material," he explained to one of his future teachers in 1895. "The beginning and the end is the individual activity."78 Knowledge is not the result of experience, any more than a response is the result of a stimulus; knowledge is experience itself in one of its manifestations. "[T]he facts and truths that enter into the child's present experience, and those contained in the subject-matter of studies, are the initial and final terms of one reality," as Dewey put it in 1902. "To op-
pose one to the other is... to set the moving tendency and the final result of the same process over against each other; it is to hold that the nature and the destiny of the child war with each other. 79

The "Reflex Arc" paper is the essential expression of Dewey's particular mode of intelligence. It is the strategy he followed in approaching every problem: expose a tacit hierarchy in the terms in which people conventionally think about it. We think that a response follows a stimulus; Dewey taught that there is a stimulus only because there is already a response. We think that first there are individuals and then there is society; Dewey taught that there is no such thing as an individual without society. We think we know in order to do; Dewey taught that doing is why there is knowing.

Dewey was not reversing the priority of the terms he identified in these analyses. Invidiousness was precisely what he wished always to avoid. In condemning (as he did) the elevation of thinking over doing as a reflection of class bias (Veblen would have said that philosophical speculation is a form of conspicuous consumption: it shows we can afford not to work with our hands), Dewey was not proposing to elevate doing over thinking instead. He was only applying the idea Addams was trying to explain to him when she said that antagonism is unreal: he was showing that "doing" and "thinking," like "stimulus" and "response," are just practical distinctions we make when tensions arise in the process of adjustment between the organism and its world. Later in his career, Dewey would criticize, in the same manner, the distinctions between mind and reality, means and ends, nature and culture. As Henry Steele Commager testified, a generation (or part of a generation, anyway) seems to have found Dewey's manner of calmly and often rather colorlessly chewing through received ideas irresistible and indispensable. Dewey thought chewing through ideas was just his job, the philosopher's way of helping people adjust to the conditions in which they find themselves. "Sorry," he would say when people praised him as an educator, "I'm just a philosopher. I'm just trying to think. That's all I'm doing." 80

Though Rockefeller was generally benignly neglectful of policy matters at the University of Chicago, he was diligent in his supervision of budgetary matters, and Harper, whose instincts were expansive and expensive, had a difficult time keeping the deficits within limits acceptable to his principal patron. He therefore preferred to have the Laboratory School support itself by tuition and donations, despite Dewey's contention that it should be funded on a par with any other laboratory in the university. Nevertheless, Harper insisted on reviewing the school's budget. A great deal of Dewey's energy was therefore spent justifying his school's expenses to an administration that did not contribute significantly to its income. This did not enhance collegiality.

In 1901, in a characteristically acquisitive move, Harper announced that Colonel Parker's elementary school and teacher training institute were being incorporated into the university. Parker was almost a cult figure in educational circles, and he arrived at the university with a patron, Anita McCormick Blaine, of the McCormick reaper fortune, who had endowed his schools with a million-dollar gift. How Parker would occupy the same institutional and financial space as Dewey was a delicate question, but the difficulty disappeared when Parker died unexpectedly in 1902.

His schools, however, had already been joined to the university, and Harper was anxious to keep Anita Blaine happy by retaining and sustaining them. On Dewey's suggestion, it was decided to combine Parker's elementary school with Dewey's Laboratory School, with Dewey in charge of the school and of every other aspect of the university's educational programs, which included a School of Education, a Department of Pedagogy, a high school, and a manual training school. Dewey had made his wife principal of the Laboratory School, and he chose to have her continue as the principal of the newly combined school.

Alice Dewey does not seem to have possessed strong personnel skills. Her new authority over the teachers in the combined school
(many of whom felt a personal devotion to Parker), with her husband to back her, was contemplated with apprehension. Anxieties were communicated to Harper; Anita Blaine was drawn into the matter; and Harper made the mistake of assuring Blaine and the trustees, but without informing either Dewey, that Alice Dewey would step down after a year as principal. When the time came and Alice was informed that her resignation was expected, the Deweys promptly resigned, she as principal of the elementary school and he as director of the School of Education. Five days later, on April 11, 1904, John Dewey resigned as chair and professor in the Department of Philosophy, effectively terminating his relations with the university. He had four children and no other source of income.

Harper realized he was losing his star, and he set about trying frantically to walk the cat backward into the house. He consulted with Mead and Angell, who urged him to apologize and conciliate; he consulted with Albion Small, who was less sympathetic to the Deweys. On April 18, Harper wrote Dewey requesting a meeting, pleading that there had been a misunderstanding. But Dewey had already written, six days earlier, to McKeen Cattell, at Columbia, informing him that "I have finally taken a step which has been in my mind for two or three years—I have resigned from the Univ. of Chicago. . . . I have nothing in view and shall have to rely on my friends to let me know of things that might appropriately come within my scope." Cattell knew how to take a hint, and he did not waste time. Nicholas Murray Butler, the president of Columbia, was a former member of the philosophy department and a former president of the institution that had become Teachers College. By April 23, he had offered Dewey a position as professor of philosophy, with a course at Teachers College to increase his salary. Dewey accepted, and the appointment was announced on May 2, 1904.

Harper had managed to have several interviews with the Deweys in the interim, but they only served to widen the breach. Dewey's final letter to Harper is dated May 10. He wishes to make it clear, he says, that contrary to Harper's representations, the firing of Alice Dewey was by no means the reason for his departure. "Your willingness to embarrass and hamper my work as Director by making use of