CHAPTER VI

Arthur I. Gates

Part I

An Autobiography

The majority of my ancestors back through several generations were similar in their characteristics and movements. They had migrated to New England mainly from England and Scotland and moved slowly westward to Pennsylvania, on to the Illinois region, and then to the northern plain states. They were predominately middle-class Protestants—farmers, storekeepers, traders, real estate dealers, with a scattering of preachers, teachers, musicians, minor politicians, and brewers. The most frequent surnames were Gates, Gaylord, Truman, and the like. My father's education was interrupted and his parent's occupational progress was upset by the Civil War. My father joined the Union Army at a little less than the minimum age for enlistment. After the end of the war he moved about the Middle West for a time, sampling several occupations. During this period he met my mother who, with a young son, had lost her husband. Soon thereafter my father decided to enter the lumber industry then flourishing in the northern plain states, a decision soon followed by marrying my mother and moving to Minnesota. Soon after my birth on September 22, 1890, in this state, my parents decided to join a large lumbering company's venture in northwestern California.

In 1892 my family, then, including two older brothers, settled down near a small town, Fortuna, in the heart of the northwestern California redwood belt. My father built a house on a six-acre plot about a mile and a quarter from the town, on the edge of a seemingly boundless redwood forest. He pursued a variety of assignments with a nearby large lumber company until he retired.

My mother told me that I learned to read with a bit of help from her soon after my third birthday. I entered school nearly a year late since my birthday came about two weeks after the fall term opened. Suffering from lack of occupation during school hours, I began early to engage in minor mischief, until one discerning teacher allowed me to spend some time daily in the "library," a dark attic room, really a storeroom, rarely open to anyone except teachers. Shortly after entering the third grade, I organized and became the captain of a sandlot baseball team, which became a joyful enterprise through the seventh grade. We played similar teams in all the nearby towns.

During these early years I helped take care of the home garden, the berry patch and fruit trees, chickens, cow, and "buggy horse." The activities were all very pleasant except two—the task of catching the horse when she felt frisky with three acres of meadow in which to dash about, and a chore which made me resolve never to be a farmer—cleaning the big chicken coop. Even with these duties, I usually took a half-time job during the summer—picking berries or fruit, splitting redwood stovewood, weeding fodder beets or corn on nearby farms.

The year before I entered the small high school which had only recently become a public institution, I was hired by the elementary school principal to do all sorts of work after school and on Saturdays in the insurance and real estate business which he conducted on the side. Shortly after I entered high school, which didn't keep me very fully occupied, I was offered another job by the owners of a "general merchandise" store during all the time I could spare from school and full time during the summer. The owners of this large store, the Friedenbachs, pioneer California emigrants from Germany, were a marvelously warm and helpful family. The work, which I kept up until I entered college, was one of the most satisfying and rewarding experiences of my lifetime. While in high school, I largely administered the grocery, men's furnishing, and hardware departments, made the window displays, wrote the advertisements and sales booklets, as well as serving as clerk.

During my third high school year, encouraged by the editor and the very intelligent typesetter of the local weekly newspaper, I began to write news items and feature reports for their paper and

for a daily paper published in the county seat twenty miles away. My daily contacts with a wide range of people and events in the store made it easy for me to pick up items to report. I found the editors of both papers more exacting than any school teacher I ever had. They gave me, along with frequent headaches, an apprenticeship that helped me to support myself in college.

Teachers in the local schools were exacting, and, although I was a mischief-maker in both elementary and high school, they were all generously helpful to me. The principal of the then small high school, "Professor" P. S. Inskip, who came to this small isolated school from England after the death of his wife, was, I came later to realize, one of the most highly cultured, well-informed, and supportive human beings I have ever met. I shall never forget his talk with me after I had messed up my first debate in my freshman year while trying to give it verbatim from memory. The tact and understanding he showed resulted in my determination to become a good debater. Nor will I forget the obvious joy he revealed when, in my senior year, I won the individual debating championship of the county schools.

Before I graduated from high school I was faced with the necessity of making a vocational decision. Three opportunities, all unexpected, opened up. In that day the king of the sports and of summer entertainment in my part of the world was baseball. The players on intertown and intersectional professional teams were the popular heroes. Just before my graduation I was offered a surprising salary to play professional ball. Almost on the same day I received notice that I had been awarded a small scholarship to attend the University of California at Berkeley. A tempting offer was the third, a proposal to continue with Friedenbach's general store with the prospect of soon becoming a partner. Mr. Inskip and my high school teachers overcame any reluctance I might have had to give up this opportunity. Actually, attending the university was the course I really wanted to take.

I entered the university in vocational uncertainty. My friends and former teachers had suggested the law, journalism, education, medicine, and business administration. All appealed to me. I took two of the excellent "vaudeville" courses offered to help a student make a choice. In one of these, a series of units on both the physical

and the social sciences, I listened with great curiosity to George M. Stratton's polished lectures concerning what psychology was all about. I was fascinated. I asked to take my half-dozen "laboratory sessions" in this field. Here I was taken in hand by Warner Brown who encouraged me to pursue further work, which I did. This was for me a very important action. At the end of my sophomore year I was offered the job of student assistant in the department. I promptly became a major in psychology and served as assistant from my junior year until I left after two years of graduate study to complete my work elsewhere.

During my first two years at Berkeley I seized upon opportunities to continue some of my former interests. I became a freshman reporter and editorial worker for the *Daily Californian,* the college newspaper, a post I gave up early in the second year when I tried more lucrative work as a free-lance writer for a miscellany of publications. I also tried out for the freshman debating team for which about forty contestants appeared. I "made" the team, but we lost our final major contest, a debate with the sophomore team which contained an extraordinarily adroit performer. I started "fall" practice with the freshman baseball squad, but found it demanded more time than I could spare. I spent a day now and then as clerk or advertising writer for stores within commuting distance. Early in my first year I had joined one of the campus house clubs, which a couple of years later became a chapter of a national fraternity. During my junior year I became the manager of the chapter house and directed all its business affairs, a post I held until the end of my first graduate year.

I took a year off after completing my sophomore year to try to build up a better financial status and to think about my future plans. I spent this period working during the day in the Fortuna store and during the evenings until midnight or later writing for a nearby daily paper and various other publications. The psychology department and the fraternity kept the jobs available to me until I returned.

When I returned to college, I took a course with Professor Alexis Lange, a former professor of English, who had been made director of the School of Education. What he lacked in familiarity with the professional side of education was compensated for by

frequent appearances of other more practical members of his staff and by his own extraordinary wit, charm, and warm concern about the welfare of his students. In my senior year I took more work in education, unwittingly thereby accumulating enough credits to meet the minimum needed to qualify as a charter member of Lambda Chapter of Phi Delta Kappa. Later, joint meetings of this chapter with the Stanford group led to my making the acquaintance with the Stanford staff, among them Ellsworth Cubberley and Lewis M. Terman. Each of these men offered me a post at Stanford within a few years after I had taken my doctorate, but I decided to stay at Columbia, perhaps mainly because of the greater novelty and challenge it then offered.

When I began my work as assistant, the psychology department had a relatively small offering of formal courses at the advanced level. Warner Brown and shortly an additional young instructor conducted a number of courses in the well-equipped experimental laboratory, and George M. Stratton took care of most of the large lecture courses in his admirably polished and charming manner. As his assistant, I set up the apparatus for his demonstrations, took rolls, kept class records, and read the examination papers. I worked more intimately with Warner Brown, a superbly thorough and exacting laboratory experimentalist. One of the most thrilling intellectual experiences of my lifetime was that of conducting subjects through a series of nearly thirty tests of "suggestibility" which Brown had developed. The subjects were volunteer students examined singly. Each was told, for example, that he or she would be given a series of tests to determine how slight a sensory stimulus he could detect. Among them was a test to determine the lightest touch on the concealed palm, the faintest odor, or the weakest taste of sweet, sour, or bitter. I was astonished and fascinated by the range and variety of the students' responses and especially by the very high degree of error—the alleged effects of suggestion. A student might swear that he had been shocked by an electric current when, after the "now" signal, the apparatus clicked as in all trials but the current was not turned on. Or he might describe the color and shape of an image on the darkroom screen when none was projected. Before the experiments were over, Brown approved of my adding a few informal tests which I had arranged to reveal the exceptional un-

dependability of the subjects' reports about their bodily and organic sensations. One test I gave up in hurry and fright when a student who declared he felt a suggested burning in his stomach after swallowing a spoonful of distilled water shortly reported great distress to the college physician. For a few hours until reassured, I feared that my career as a psychologist had come to an end.

I was advised to study largely on my own from the middle of my junior year. I surveyed carefully the major works of the world's leading psychologists available in English or German—such as those of the German leaders Wilhelm Wundt, H. von Helmholtz, and Ernst Meumann; the translated French reports of Alfred Binet and H. Bernheim; and the publications of Englishmen such as E. B. Titchener (later at Cornell) and of many Americans, especially William James, James McKeen Cattell, R. S. Woodworth, Charles H. Judd, L. M. Terman, and E. L. Thorndike.

Brown advised me to follow what was then a rather unusual program for an undergraduate student. He suggested that I read more and attend lectures less, mainly because I could cover so much more ground. He urged me to avoid becoming too tied down to books, however, and to engage in a variety of more practical explorations such as giving Binet intelligence tests to different kinds of children and adults, talking with psychiatric cases, and investigating by laboratory and clinical techniques other exceptional individuals. Among those I studied was an overconfident trumpet medium (in which Brown joined), the world's champion rifle shooter, and youngsters being investigated by the San Francisco Juvenile Court.

But Brown's most important innovation resulted from his belief that study and experience in research should come very early and not, as was then and even today is the usual practice, very late in one's program. He told me to begin at once to study the major methods of research then employed in psychology and to learn how to use them, including what I could master of the statistical method being introduced in America mainly by Cattell and Thorndike at Columbia. I was advised definitely that I should be ready to launch, at the beginning of my senior year, one or more pieces of research. His view was that a major question about pursuing a career as a college teacher of psychology was whether one had a

real interest in and aptitude for research and the sooner one found out the better. Accordingly, early in my senior year I presented to Brown a proposal for several investigations. He gave me free choice, but I followed his tip not to undertake a couple of my early choices because he realized that they were too large or too subtle for me to handle at that time.

I undertook two lines of research, one a typical laboratory study of the physical and physiological symptoms of students as they went through several typically exasperating sessions in learning to trace figures shown only in a mirror. The other larger enterprise embodied a research pattern that I used frequently in later years—a combination of group tests or experiences yielding data which could be analyzed by statistical methods followed by relatively extended laboratory, observational, or "clinical" study of some or all of the cases individually.

I finished these studies late in the spring of my senior year and wrote four reports which were submitted to Brown at the end of the term. Three of them were later published.[1] The report of the "mirror-drawing" study was quite properly never published.

During the following two years of graduate study I continued a similar program of work. I served as manager of the fraternity house for one more year, but greatly reduced my free-lance writing. My work as departmental assistant was widened. I arranged my own program of study and undertook several pieces of research. I became gradually more and more attracted to the work of Cattell, Woodworth, and Thorndike at Columbia, which was then widely regarded as the leader of American universities in psychology. Almost at the same time in the spring of my second year I was offered a fellowship at Stanford by Terman and a choice of a fellowship or teaching assistantship at Columbia. I chose the assistantship at Columbia. There I became responsible primarily to Cattell, but served several departmental needs and taught the graduate course in experimental psychology. One of my most difficult jobs was getting ready various complex pieces of apparatus for Cattell to demonstrate before his graduate seminar class. Many of these were unfamiliar, unique inventions of Cattell (including de-

1. In the *University of California Publications in Psychology*, Vol. I, No. 5, 1916, pp. 323-44; No. 6, pp. 345-50; and Vol. 2, No. 1, 1916, pp. 1-156.

vices for observing and recording visual perception) which, because of long use, were inclined to be balky. Woe descended like a cloudburst on any assistant who failed to make Cattell's apparatus work properly during a demonstration. Professor A. T. Poffenberger, youngest of the psychology staff at that time, and one of the warmest, friendliest, and most helpful persons I have ever known, saved my professional life on numerous occasions.

I did not enroll in but was permitted to visit freely in several courses outside the department. One was with anthropologist Franz Boas, another with John Dewey. Since Dewey's course came at an inconvenient time for me, I heard him less often than I liked. I saw more of him informally a few years later. I had hopes of taking considerable work with Thorndike at Teachers College. When I called at his office I was surprised when, instead of suggesting that I take his "advanced" educational psychology or his course in mental measurement, or both, he advised me to take his course that was open to all Teachers College students, the "Psychology of the School Subjects." He stated that his work in this field would be more novel to me because he had published very little of it. He was right. It was new, ingenious, exceedingly interesting, and often puzzling to me. I remember that when he began to talk about teaching reading, he mentioned the term "phonics," which I didn't understand. There are many persons who, years later, have insisted that this is still the case.

Early in the year I discussed the choice of a dissertation problem with my advisers. I showed them some of the data I had gathered in California during the preceding year. They all seemed chiefly interested in some hunches I had developed about the strikingly different mental activities which appeared among children when they were engaged in trying to learn, in one case, by reading and rereading material in comparison with those which appeared when after the first reading they recalled as much as they could, and reread only when their memory failed. I reported that my data seemed to conflict with the learning by "repetition" idea and to suggest the tremendous importance of restructuring the complex learning procedure at every step. They suggested too the importance of emphasizing the techniques of learning, of mastering the "tricks of the trade" as one went along in contrast to mere review,

mere "stamping in the bonds." I had no intention of trying to offer this collection of data as the basis of my dissertation. Cattell, however, asked me what I would like to do next to round out this study. I said I would like to conduct extensive laboratory tests and observations of and conferences with more expert and sophisticated subjects, such as graduate students in psychology already experienced in self-analysis and "introspection." To my surprise, I was told after the staff completed their private review that they all approved of my adding these studies to my present data and of my trying to complete my work for the doctorate in the following June, instead of a year later, as I had expected. This I managed to do.

My dissertation, given what I now regard as a very poor title, "Recitation as a Factor in Memorizing," was approved by the committee consisting of Cattell (chairman), Woodworth, Thorndike, and Poffenberger. During the spring term Cattell offered me a summer job doing editorial work on his book *American Men of Science* and his several professional journals, including the recently launched *School and Society*. Soon thereafter Thorndike rendered me utterly speechless by offering me a place on his staff at Teachers College. When I stuttered that I had never taught school a day in my life, he arose with a broad grin, saying, "Neither did I."

And then the country became deeply involved in World War I. Thorndike, Terman, Guy M. Whipple of Cornell, and others shortly persuaded the national administration to launch for the first time a wide program of psychological services. This is the group that developed the famous Army Alpha and Army Beta Intelligence Tests, the Army Personality Inventory (mainly the work of Woodworth), and other classification devices. Thorndike was asked to become chairman of the Committee on Classification of Personnel, which he agreed to do providing he served as a civilian. Appointments as commissioned lieutenants were available to persons who had received a Ph.D. in psychology. When I reported to Thorndike in the late spring that I felt I should apply for a commission, he suggested that I first talk it over with Cattell and Woodworth. When I met them, Cattell told me bluntly that Thorndike would accept the assignment as chairman of the committee only if someone would take much of the teaching load off his shoulders, and that, unless I felt that I could as a lieutenant be of greater service

to the country than Thorndike would, I should not apply for the commission. Needless to say, I hurried to tell Thorndike I would remain at Teachers College.

My summer at Cattell's mountaintop residence and business offices in the Hudson Valley was richly rewarded. He had long fathered the American Association for the Advancement of Science. He supported all movements in psychology with the exception of Freudianism and psychoanalysis in other forms. A brilliant laboratory investigator, as his early work on visual, especially word, perception in Wundt's laboratory attested, he was also the first to promote in America the statistical method to which Galton had introduced him in England. Although he admired the "system builder" type of psychologist, especially William James, whose student Woodworth he appointed to the Columbia department, and Thorndike, whom he induced James E. Russell to employ at Teachers College, he was somewhat skeptical of the value of most systems and never developed one! He defined psychology behavioristically —"Psychology is what psychologists do." He greatly admired top-notch philosophers, especially the converted psychologists James and Dewey. I think he regarded Thorndike as I did—as the most inventive and versatile psychologist of his generation. He was a very strict perfectionist possessed of a piercing, caustic wit which made life miserable for many, notably President Nicholas Murray Butler, whom he regarded as a bit pompous. I thought of Cattell as a very loving father, but a quite naughty child. I developed a great affection for him.

When I took up quarters at Teachers College, having taken there only one of Thorndike's courses, I was given a first-level course in educational psychology and shared with Thorndike his "Advanced Educational Psychology" and his "Psychology of the School Subjects." He asked me to take a desk immediately behind him in his office and I assisted him, as best I could, in many of his arduous duties as chairman of the very important committee on personnel. I worked on copy for tests, analyzed all sorts of data, wrote up tentative reports, and supervised considerable experimental work and testing in the New York area, especially the trial runs of tests on factory workers, automobile drivers and repairmen, machine operators, etc. I suffered in teaching the Teachers College students

who were almost all experienced teachers, administrators, and specialists, and older than I. I remember one large school principal of about forty years of age who, during a lecture I was giving on child development, stated in a loud and confident voice, "Young man, when you get a little older and have a few children of your own, you won't make such foolish statements as those!"

During the war I started little research or writing on my own, but I did try to achieve some understanding of professional education and the role I might play in Teachers College. I got well acquainted with a number of the college leaders—Dean James E. Russell, Paul Monroe, George Strayer, William Kilpatrick, Henry Johnson, and many others. Thorndike was always encouraging and helpful but anxious that I follow my own inclinations. I do not recall that he ever suggested I explore any particular field especially, except a rather casual comment that he felt that the study of learning in the case of the school subjects would be as rewarding as he found it difficult and complex.

In the fall of 1919 I noted in the sizable course in advanced psychology which I shared with Thorndike a girl who was obviously younger, more vivacious, and more beautiful than anyone else in the room. I sighed inwardly as I thought that she would probably turn out to be one of the youngsters who occasionally enrolled in the course because of convenience or curiosity and that, after the first written examination, I would have to carry out Thorndike's request to ease her out. When the results of the first objective tests were ready, I was astonished to discover that she had the top score. I found out soon that she was Georgina Stickland, a Phi Beta Kappa student at Barnard, who had just been asked to serve as assistant to Professor H. L. Hollingworth, head of the Department of Psychology. I soon encountered her often at psychology affairs and found out she was shortly to get her Ph.D. from the tough Columbia department at the then unheard of age of twenty-two. Having fallen in love with her completely, I found as I pursued her that her social charm, grace, and warmth at least equalled her intellect. After she agreed to marry me, I remarked to my two roommates that not only did I adore her but I realized that if I didn't make a go of it professionally, she certainly would!

After receiving her doctorate, she was appointed instructor in

psychology at Barnard. She continued at Barnard after we were married in 1920 and was soon made assistant professor, a post she kept on a full-time basis until our first child, a boy, was born. She went on half time until soon after our daughter was born, when she resigned. Needless to say, she has been of inestimable help to me professionally as well as a perfect partner in every other way.

Our son, Robert Gaylord, born October 7, 1929, went through the college's Horace Mann Elementary and Lincoln High schools, then to Columbia College, and finally to the Columbia School of Engineering, where he took a doctor of science degree in a combination of mechanical engineering and metallurgy. He is now engaged in research in the research center of a large industrial corporation. Our daughter, Katherine Blair, born January 15, 1934, went to the same elementary and high schools until the latter closed, after which she went to other private high schools, then through Vassar College, and, after a year spent in Oxford on a Fulbright Fellowship, returned to take a Ph.D. degree in the Harvard-Radcliffe program in English literature. She has since been teaching English in a liberal arts college. Both of our children are married.

As the pressure of the war demands began to ebb, I realized it was high time for me to consider thoroughly what I should undertake to do in the future. Probably the most pressing problem was the choice between cultivating what Dean James E. Russell called the "academic and the professional" mind. He made it clear that he felt that Teachers College should chiefly reward the persons who sought primarily to solve the professional problems of education. The person devoted primarily to "pure" psychology, to academic schools or theories of psychology, should be supported by the older, more numerous, more affluent academic departments. The issue as he saw it was not quite the same as that based on the popular distinction between pure or theoretical psychology on the one hand and applied or practical on the other. He was clearly aware that Thorndike, Dewey, and many others developed general theories which had clear and immensely useful professional implication whereas others had evolved theories which, however valuable they might be for "academic" psychology, were not very intelligible or useful in practical fields. Since I had devoted my student days to theoretical psychology with about as great enjoyment as with the

experimental discipline, I felt I must decide soon whether to try to do something in it. I elected to try my hand at developing the general theoretical concepts, at conducting experiments aimed primarily to reveal general principles, and to study and consult with a few highly competent persons who seemed to have somewhat different convictions.

Among the early experiments I conducted was one designed to test whether the development of particular practical skill involved any general constitutional change or an increase in capacity, or merely the acquisition of techniques or tangible abilities or "tricks of the trade" as my dissertation suggested.[2] Another was an experiment designed to reveal whether putting a person through an undeveloped skill by artificial means, such as moving a child's hand through the movements of tracing the letters, would impress the skill into the child's system, or whether such a skill would result only from the child himself giving birth to the proper movements.[3] Another was an effort to see whether two related aspects or components of a skill could be combined by a mathematical formulae as in the physical sciences. I found that it was possible to combine the rate of speed and the level of quality in a specimen of handwriting by such a formula,[4] but I was unable to do this with anything else I tried.

I soon began to feel that the more I examined this ancient distinction, the more indistinct it became. For example, when I reflected on Thorndike's many investigations, I concluded that his greatest contribution to psychological theories—to pure science—was the series of learning "laws" or theories he conceived to explain the activities of cats and other animals endeavoring to solve the crude puzzle boxes in which food was placed. This was his famous doctoral dissertation. What could be more practical or pro-

2. "The Nature and Limit of Improvement Due to Training," *Nature and Nurture*, pp. 44-60. Twenty-seventh Yearbook of the National Society for the Study of Education, Part I (Bloomington, Ill.: Public School Publishing Co., 1928).

3. "The Acquisition of Motor Control in Writing by Pre-School Children," *Teachers College Record* 24 (1923), 459-69.

4. "The Relation of Quality and Speed of Performance: A Formula for Combining the Two in Case of Handwriting," *Journal of Educational Psychology* (1924), 129-45.

fessional or more typical of daily activities than a cat's efforts to find its way to food in a clutter of box-like slats, or a thicket of shrubs, or a pile of garbage and rubble!

From the day these studies by Thorndike were reported they have been regarded by the profession as singularly brilliant and important examples of "academic" or general or "pure" psychology, but they seem to me to be equally significant examples of practical or professional psychology. When it is stated that "applied" psychology is a different activity, a case of viewing a practical situation by applying to it the investigator's stock of "principles," it should be noted that Thorndike clearly stated that he vigorously "applied" to the animal behavior such explanatory principles and theories as he knew and that he was forced to evolve new ones when he was convinced that the old ones were unsatisfactory. The feature that made his studies an admirable case of scientific or general or pure psychology was not the form of the activity under observation, but the way the investigator brought to bear upon it all the technical and intellectual skills, the insights, controls, facts, theories, and principles he had at hand—the way he sought for a deeper, fuller, more revealing explanation of the phenomenon. The more characteristic of typical daily activities the experimental operations are, the more likely the explanatory principles are to be sound and useful. Perhaps the artificial experimental situations should be resorted to only when the variables cannot be satisfactorily controlled in more typical activities.

My study of psychological theory led me gradually to certain other convictions. One was that the psychological laws or principles are unlike most of those evolved in the physical sciences, like which most psychologists hoped they would become. They are not "laws" in the same mathematically exact sense. They are more like succinct summaries of the major revelations of investigations. They are close kin to practical maxims; they resemble brief practical guides.

I soon became convinced that psychological principles were not so widely applicable as the typical laws of the physical sciences. Thus, when the Gestalt psychologists insisted that Thorndike's "trial and error" formula did not provide a satisfactory explanation of the monkey's deliberate use of sticks and other objects or "tools" in certain puzzle situations (and even if they were correct in assum-

ing that their principles rationalized these "more intelligent" forms of learning better), they seemed to me to be wrong in assuming that they had better explanatory principles for all forms of learning, particularly for the kinds of problems which were presented to Thorndike's cats.

In any event I gradually reached the conviction that I could do more for education by applying my kit of scientific concepts and techniques to some of the multitude of complex and puzzling problems one must face in the daily tasks of teaching than to confine them to work in the typically narrow and artificial situations then so characteristic of the pure, theoretical psychology and the more artificial experimental laboratory tasks I had been trained to do. If no general principles appeared in a study of typical operations in teaching reading or grammar or solving a problem in algebra, or in controlling one's emotions when one fails to solve a problem, thorough, analytical study of the phenomenon is at least more likely to lead to some observations useful to a teacher.

I decided, however, to divide my time for a few years between work on general or theoretical psychological issues and the practical problems in education. Thorndike approved heartily and said, to my surprise, that I would find the latter more difficult, partly because one must avoid being blinded or led astray by the confusion of uncontrolled variables in which they are typically enmeshed.

An excellent opportunity for tackling problems professionally soon opened up through the overtures of one of the students who was in the first class I taught (with Thorndike) at Teachers College, Wilford M. Aikin, who had become principal of the private experimental Scarborough School and later became the director of the famous Eight-Year Study. He suggested to the founder of the school, Mr. Frank A. Vanderlip, that I be asked to direct studies of some of the problems in which the latter was interested. Arrangements were soon made. With my student Miss Jessie Lasalle as my assistant, I carried out during the following year an array of group and case studies which were published in a small book, *The Psychology of Reading and Spelling with Special Reference to Disability*.[5] Needless to say, I carried into these analyses many devices

5. New York: Teachers College Bureau of Publications, Teachers College, Columbia University, 1922.

and techniques I had used in the psychological laboratory and I tried to invent additional ones to meet the new problems.

During this period I maintained a full program at the college and started work on two texts in general psychology, one primarily for students of education and the other for students in all fields. I also tried to maintain some experimentation in general psychology. The college provided some quite expensive apparatus which I used in an effort to analyze certain physiological and emotional reactions to pleasant and unpleasant emotions and to states of relaxation and fatigue. One of my hunches was that the percentage of sugar in the blood and the contraction of the stomach muscles would prove to be a delicate index of these conditions. After spending many long and trying hours, I gave up this enterprise partly because I failed to develop a stomach balloon that subjects could swallow without distress and partly because I learned that a college medical officer felt that a doctor should supervise my analysis of blood sugar. A few years later, one of my students, a brilliant young Japanese girl, Tomi Wada, soon referred to as "Tummy Waddle," designed a tiny balloon which, swallowed and inflated, served without distress to yield valuable data reported in her doctor's thesis.[6] My plans to do further work along this general line were never carried out.

The writing of the texts proceeded with fewer headaches. *Psychology for Students of Education* was finished in the summer of 1922 and published in early 1923. *Elementary Psychology*, largely written during the following two years, came off the press in 1925.

Certain features of these two texts aroused quite a stir of interest and resentment, especially from older educators and psychologists. I think the former was the first text to include a full treatment of "mental adjustment." It introduced some Freudian and other psychoanalytic ideas. Although these were reformulated into psychological mechanisms and given such innocuous names as "sour grapes mechanism," "substitute activities," "compensation adjustment," etc., the publisher and author received many indignant protests of this and certain other rather novel sections of the book which later became the most popular ones, especially among the students and younger instructors.

6. Tomi Wada, "Experimental Study of Hunger in its Relation to Activity," *Archives of Psychology*, No. 57, New York, 1922.

The basal theoretical principles adopted in these books, after careful deliberation, were largely modifications of the Thorndike-Woodworth formulations. For Thorndike's "formation of bonds" formulas I substituted a "reaction hypothesis" structure, somewhat similar to Woodworth's scheme. I found this more helpful than anything else I could locate or contrive for formulating general psychological concepts and enlightening professional problems. That I still feel the same is probably in large measure the result of habit and inflexibility. But I still retain the conviction that the choice of a theoretical system in our field is largely a personal matter. Some can function better with one, others with another. None is as yet all right or all wrong. Each has been, and properly can be, modified greatly to take into account new data and ideas. One is justified in selecting the system that helps him most, somewhat in the way he chooses a "life-style," to use Gordon Allport's phrase, or even a religion.

I found that the work in the experimental study of professional school problems and the work in the general theoretical field were about equally fascinating. I realized indeed that all that I learned about one enriched my understanding of the other. The combination of the two, call it what you will—pure, professional, applied—is the ideal, at least for most purposes.

In December 1927 Thorndike provided me with an opportunity to explore a wide range of school activities. He asked me if I would like to join him in revising his *Education: A First Book*, which he published in 1912. I was of course flattered, but I asked him to consider the difficulty I might make for him if I employed the variations from his terminology and systematic theories I was then accustomed to use. As was always so characteristic of him, he said he would enjoy seeing what would come forth and discussing any differences which might lead to serious consequences. It was agreed that I would rewrite the whole book, as I saw fit, before showing him any of it. I took the summer off, retreated with my wife to Maine, and presented him with my complete revision when the college opened in September. Modifications acceptable to both of us were worked out during the next three months and the book was published in 1929, but we never found time to revise it.[7]

7. *Elementary Principles of Education* (with E. L. Thorndike). New York: Macmillan Co., 1929).

Before I reached the end of my first year of work at Scarborough, Dean James E. Russell asked me to use the college's Horace Mann Elementary School for my experimentation. There I undertook to subject some broad educational patterns to reliable tests. The most successful of these studies was published: "A Modern Systematic Versus an Opportunistic Method of Teaching," [8] methods which had been debated for years but never investigated objectively. I also conducted or supervised studies of the initial stages of learning such skills as reading and handwriting and I made a kind of laboratory-test, clinical analysis of disabilities and difficulties in the school subjects. These lines of attack were shortly expanded and extended for use with other classes in the public schools, youngsters in institutions such as the Lexington School for the Deaf, and community clinics and hospitals. In such enterprises as these I spent as much time as I could spare from my teaching and administrative work at the college during the remainder of the 1920-1930 decade.

I was most productive in research on practical educational problems between 1920 and 1935. A major purpose was to see what improvements I might suggest in everyday teaching of the common branches by application of psychological theories, devices, and techniques. I became convinced that the most crucial and revealing way to test an educational material or method was to try it out on children who had an extreme aptitude or limitation or disability for a particular type of learning. For example, the most crucial test of the value of "phonics" or word-sound approach to learning to read would be to see how children deaf from birth could learn to read by other methods. Coming to grips with individual abilities and limitations was obviously important for wholly practical, as well as theoretical, values. Accordingly I sought methods of diagnosing and prescribing for individual cases in the hope that sooner or later schools would provide teachers and specialists who could rival in their field the expertness of a well-trained physician in his. I carried out and published many studies by myself and supervised many others reported mainly in doctoral dissertations by my students. In 1927, I published a program of diagnostic and remedial

8. *Teachers College Record* 27 (1926), 679-701. (With Mildred I. Batchelder and Jean Betzner)

study of difficulties in reading, spelling, and a battery of tests and diagnostic materials.[9]

Early in the decade, I supervised the preparation of a series of what would now be regarded as programmed materials both for reading and spelling courses.[10] One of the former consisted of over twelve hundred pages of classroom material for teaching beginning reading for less than a school year. Other similar outfits variously supplemented by the teacher were tried in numerous other public and private schools and with deaf-mutes and many other exceptional children. The results were reported over the years in various articles, monographs, and several books.

During the two decades following 1930 I found myself so increasingly occupied with duties as teacher, administrator, committee member, worker in professional and scientific organizations, and with family and social activities that time for research and scholarly enterprises became harder to find. I tried, however, to devote more attention to advanced students and to writing or revising comprehensive texts. I did as much research as I could. I kept alive several of my major textbooks by a series of revisions. *Elementary Psychology* went through two revisions before I gave it up to concentrate on my work in the field of education. *Psychology for Students of Education*, which was translated into several other languages, was repeatedly revised. With the cooperation of Arthur T. Jersild, T. R. McConnell, and Robert C. Challman, a more comprehensive work, *Educational Psychology*, was brought out in 1942 and revised later. *The Improvement of Reading*, with its diagnostic and remedial program, was repeatedly revised until I retired, after which with the cooperation of Anne McKillop the diagnostic materials were reconstructed.

I published during this period a number of other books, mainly smaller volumes, such as *Reading for Public School Administrators* (1931), *The Acceptable Uses of Achievement Tests* (with Paul R. Mort, 1932), *Generalization and Transfer in Spelling* (1935); wrote chapters or sections for many other books and yearbooks; and edited a few, such as the Forty-eighth Yearbook of this Society,

9. *The Improvement of Reading* (New York: Macmillan Co., 1927).

10. Assisted by such remarkable students as Ruth Strang, Margaret Mead, and Dorothy Van Alstyne.

Part II, entitled *Reading in the Elementary School* (1949). A large array of books, workbooks, practice exercises, and other classroom materials, together with more than three thousand pages of teachers' manuals, were brought out and revised from time to time.

During the decade following 1930 I engaged in several large-scale enterprises made possible and desirable by the Great Depression. Soon after 1930, unemployment among New York City teachers, especially of the younger ones, reached alarming proportions. In 1933 George Chatfield, then assistant (later associate) superintendent of schools, and I drew up plans for a city-wide remedial reading project, a plan to deal individually or in small groups with the worst cases of reading difficulty to be found in the city's elementary schools. When the Federal Civil Works Administration support was provided, I selected twenty-three supervisors, mainly from students I had trained in diagnostic and remedial work, to join me in giving two weeks of intensive training to about two hundred previously unemployed teachers, and then sent them out to tackle the city's toughest educational problems. Their phenomenal achievements during the following four months provided me with one of the most thrilling experiences of my professional life. These (mainly) young, but previously deeply worried, teachers became remarkably devoted, determined, and successful apostles; they gave a genuine educational resurrection to more than 90 percent of the city's "hopeless" cases. During the second and third years, this continually growing project was directed by my lieutenant, Dr. Annette Bennett, after whose untimely death it was taken over by the city's staff and continued for several more years under the general administration of Dr. May Lazar of the Bureau of Educational Research. At times it gave a rich apprenticeship and modest salary to as many as seven hundred teachers who probably would otherwise have been unemployed.

A second enterprise, called "The Writers' Project," I sketched out with Mr. Chatfield, who succeeded in getting federal funds to support it. For the sizable group of "writers," mainly unemployed feature writers for many kinds of publications, but including also teachers who wished to try their hand, and several previously successful authors of children's literature, I sketched a plan of developing small books of relatively easy reading material but of

more advanced interest levels. Once the project was well under way, it was supervised by one or more city school officials. Unemployed artists were added. I have now in my files over three hundred published small books, sixteen to forty-eight pages, of fully illustrated materials of all sorts, prose and poetry, adventurous, humorous, fanciful, historical, factual. The New York City school children loved them. It is true there was once a battle—a near riot in one school—after an author, having read one of his own manuscripts to a group of overage, mainly "nonreading" boys, showed several of his others on which he wanted the boys' advice before committing them to the printer. The fight occurred during recess when the lads found there were not enough "books" to go around! They were found guilty—of never before having stayed in a classroom during recess on their own accord.

The third WPA project was worked out jointly by my Teachers College colleagues, William Featherstone (administration), Leta S. Hollingworth (psychology), and myself, with Benjamin B. Greenberg, later an associate superintendent of the city schools. Known as the Speyer School Experiment, it was based on five classes of bright children (I.Q. 120 and above) and seven classes of "low-normal" pupils (I.Q. 75-95). Professor Hollingworth carried out her curriculum with the bright, and I worked with the low-normal pupils. The principal, supervisor, and all the teachers were selected from the New York City schools. My chief lieutenants were Guy L. Bond, joined later by David H. Russell and Andrew Halpin. The school carried on for five years. More than a dozen reports of the experiment and various experiences were published.

When Teachers College began to open its doors around 1920 to part-time and in-service teachers, our teaching loads increased. My "service" course in educational psychology, like many other offerings in other fields, often attracted more students than could be accommodated in our largest classrooms. The number of full-time, advanced students also increased rapidly, and during the several years preceding 1927 when I relieved Thorndike at his and Dean Russell's request as chairman of two large departments—psychology and research methods—I had been carrying much of the administra-

tive detail. These ever increasing demands slowed down my research and writing considerably during the following two decades.

The rapidly increasing enrollment of part-time students seeking practical advice and training resulted in a gradual change in the character of the college. Those engaged extensively in research and scholarly work tended to devote more time and attention to dealing with the professional problems which these faced. To provide for the increasing number of students, the college employed more and more instructors predominantly expert in the practical school tasks. Many members of the staff feared that the scholarly component of the college's activities would dwindle.

In 1933, Paul R. Mort, with Dean William F. Russell's approval, launched a plan for a relatively independent Advanced School within the college which would primarily promote advanced research and study. It was to include two divisions, one emphasizing professional preparation and leading to the new doctor of education degree, the other emphasizing the more theoretical type of research and scholarly work leading to the doctor of philosophy degree. Nicholas Engelhardt was invited to serve as chairman of the former and I as head of the latter. Paul Mort was the overall director.

During the following several years only promising advanced students were accepted and only a portion of the staff was assigned to the Advanced School. Plans for certain separate quarters and research facilities were worked out. Opposition to the venture became increasingly apparent. Many members of the staff and student body felt that it represented an undemocratic division of both groups into the sheep and the goats. Finally, Dean Russell called for a secret ballot which showed the opponents of the Advanced School to be in the majority, and it was abolished in 1937. Many believed that the college thereby started a march toward the trade school pattern. I felt that special provision for encouraging advanced study in both lines was desirable and needed. I have always thought, however, that the best arrangement for the college was to provide approximately equal emphasis and power for the two concerns, as seemed to me to prevail when I first joined it. At that time, for example, George Strayer was as respected and influential as Thorndike, and each admired and supported the other. If the emphasis swung too far one way following the abolition of the Advanced

School, I feel that in Teachers College and other schools of education it has in recent years been moving back toward a happy medium. I feel that the two should represent merely a degree of specialization growing out of a larger area of common knowledge and concern.

During these decades, keeping informed about developments in many other rapidly growing fields such as philosophy, sociology, anthropology, as well as new, more practical fields such as curriculum and guidance, became increasingly difficult. Although I had few personal contacts with John Dewey, I tried to maintain a reasonable degree of familiarity with the stream of challenging ideas which flowed from him throughout his long life, especially those related to educational policies and practices. Fortunately, Dewey was a prolific writer and a number of my colleagues at the college kept well informed about his views. I have always believed that many of his ideas, properly interpreted, including his conceptions of educational methods in the narrower sense, were enormously important. Interestingly enough, I was often criticized during my first professional quarter century for being unresponsive or hostile to Dewey's ideas and during the second for being a naive victim of his "permissive" or "progressive" notions. I have long felt that his views of certain crucial features of good method such as those described under such terms as interest, effort, purpose, drive, motivation, goal-seeking, self-diagnosis, self-direction, and self-determined insight were highly insightful and valid. I think he sensed the essence of many modern notions of "understanding" psychology, on the one hand, and of such behavioristic concepts as B. F. Skinner's reinforcement theories on the other, although I expect many followers of both disciplines will be scandalized by this statement. I have treasured many of his succinct, classic expressions of method, such as the following.

> The question of method . . . is no longer a question of how the teacher is to instruct and how the pupil is to study. The problem is to find what conditions must be fulfilled in order that study and learning will naturally and necessarily take place, what conditions must be present so that pupils will make the responses which cannot help having learning as their consequences.[11]

11. I quoted this in my *Interest and Ability in Reading.* (New York: Macmillan Co., 1930).

In my earliest work at Teachers College I felt I was striving to develop a program which embodied something of this sort. Soon thereafter I adopted the phrase "intrinsic method" (of teaching reading or indeed anything), which I feel is validly suggestive, even if it has been widely misinterpreted. I was trying to achieve similar objectives when I was developing, for example, the previously mentioned, very detailed, carefully controlled twelve-hundred-page programmed materials for teaching beginning reading. My associates and I sought to embody certain principles of learning in this program—the choice of realistic, everyday material, interesting and challenging activities and projects organized in ways that "could not help having learning as their consequence"—and to realize the then Thorndikian and the current Skinnerian ideas of guiding learning by revealing detailed successes and errors and omissions at small steps in its course. Finally, we were attentive to the importance of "concomitant" or "simultaneous" learnings (Dewey-Kilpatrick terms), especially of satisfaction in the process and the acquisition of techniques of learning, "tricks of the trade," ways of maneuvering and of achieving insight into one's own ways of learning. Among the "techniques of learning," etc., should be included, in my view at least, all those operations, maneuvers, and subtle activities involved in what are referred to as comprehending, perceiving, understanding, thinking, reasoning, imagining, problem-solving, concept-forming, and the like.

If the sketch of the desirable components of the learning process I have drawn seems pretentious and unattainable, I must insist that James, Thorndike, Judd, and especially Dewey long ago quite clearly recognized them as ideals of education, as objectives to strive for, not occasionally or in separate formal exercises but during every hour in every school subject and activity. This, I think, is really a psychologically sound substitute for the old, faulty faculty theory—a promising possibility for realizing, by tangible even if obviously more complex and difficult means, objectives similar to those mistakenly sought by the methods of formal discipline.

I recall from my early years similar expressions, both by Dewey and Thorndike, of the difficulty and danger of giving an opinion about a practice when it must be based not on a thorough study of the program in operation, but on a limited observation or an

incomplete description. The greatest difficulty, each said, was to see the whole program in sufficient clarity and detail to tell whether it embodied the principle of learning which he thought was desirable and was free of too many omissions or conflicting features. During the remainder of my professional life I felt the point of their comments with increasing frequency and sharpness. This explains why "applying" principles to practical situations is so frightfully difficult and risky, why all manner of practices and theoretical formulations have been advocated as examples of Dewey's or Thorndike's convictions. I can illustrate this point by a striking example which I encountered in working on a yearbook of this Society.

In 1940 T. R. McConnell and his committee set out to prepare a much needed yearbook on the then, as ever, numerous and apparent divergent theories of learning. I approved of inviting a former student of Thorndike, then an outstanding Canadian psychologist, Peter Sandiford, to write the chapter devoted to Thorndike's views. When I reviewed the manuscript for McConnell, I had to report that Sandiford's account represented a theoretical and practical emphasis, indeed, a whole verbal structure that was very different from my own. At McConnell's invitation I wrote another chapter, embodying my own conceptions. Both were published in the yearbook.[12]

Retirement at Teachers College is mandatory at the end of the academic year which includes one's sixty-fifth birthday, a time I reached on June 30, 1956. During my last year I received the approval of President Hollis Caswell and the college trustees to set up an institute for research which I had agreed to finance. The title "Institute of Language Arts" and my designation as "supervisor" (since a retired person could not be given any official title then in use in the college) had no particular significance. It was understood that I could do whatever I wanted—within socially acceptable limits!

I began by trying to do some reading and to observe certain research enterprises I had long wanted to investigate. I provided a

12. *The Psychology of Learning*, chaps. iii and iv, Forty-first Yearbook of the National Society for the Study of Education, Part II (Bloomington, Ill.: Public School Publishing Co., 1942).

few internships in research for carefully selected advanced students, who were either put on my payroll or given the Gates or Macmillan fellowships. Among these have been a number of very brilliant young persons who now hold important posts in colleges and other institutions. Gradually I followed my inclination to reduce the amount of time and money put into particular investigations in order to devote myself more fully to exploring a few general theoretical ideas and especially to encouraging research and scholarly work relating to problems in every field of education. During the last eight years prior to the present date (November 1968) my writing and speaking and my activities in societies and committees have been primarily directed to this end. I have found especially rewarding the study of two professional fields, agriculture and medicine, in which scientific and scholarly work has been almost incredibly fruitful. I have repeatedly urged that we in education learn more of their ways and those of many other disciplines and practical fields.

I think it appropriate for me to conclude this fragmentary account with some recent suggestions for increasing our ability to advance the welfare of the human race by means of education. The first of these is taken from an address I made following a banquet in celebration of the fiftieth anniversary of the establishment of the Lambda Chapter of Phi Delta Kappa fraternity in Berkeley.[13]

Science can be described only as a variety of attacks made by a number of quite different men. Science was the early theoretical work of William James, whom many regard as the greatest psychologist of all time, despite the fact that he made but one experimental study, the design of which was quite faulty. James was a theorist whose pen was guided by the angels. The scientific movement at Columbia included John Dewey, trained for and inventive in a career in psychology, who began early to attack the most complex social problems with the slow, deep persistence of the oxen which plowed the soil of his native Vermont. There was James McKeen Cattell, head of Columbia's Psychology Department, whose savage brilliance illuminated the educational significance of both the experimental and statistical approach. And there was Charles Judd, the crusty [but vastly talented] Chicago advocate of laboratory experimentation, and Edward L. Thorndike, the scientific movement's most prolific worker, possessed of a most brilliant and

13. "Science or Sanity?" *Phi Delta Kappan* 45 (1964), 297-302.

versatile mind, one which threw shafts of lightning into the most unpredictable places.

There were others, but these illustrate the range of differences in personality, in methods, in fields of work. These men, especially James and Dewey, were both scientists and philosophers, sometimes one, sometimes the other, or both in some degree all the time. . . . The essence of science is a kind of thinking. Science comprises the kinds of thinking these men did.

The second, based on several convictions arrived at in recent years, points to the need for a greater amount of experimentation than I had previously thought necessary. This belief, which I arrived at after reviewing the results of similar experiments conducted at intervals over my professional life, I recently expressed as follows:

The values of most reading materials and methods [for example] depend more upon what children do at the time in school and out, upon attitudes and abilities they possess, and upon the skills and habits of their teacher than upon any inherent, absolute virtue of the material or method itself, or on any basal psychological principle. Experimental results obtained before 1930 are often very different from those secured today, and practical recommendations made then were and should have been different. We should expect that most of them will not be valid now. Note also, if you try to reach conclusions about desirable practices today by summing up the results of studies done over a span of many years, you merely get ambiguity. Any study done in the past is meaningless when taken out of context, that is, when interpreted without taking fully into account the vital characteristics of the time. "Sufficient unto the day the [educational practices] thereof." [14]

This, of course, means that we must reinvestigate the values of school materials and practices at frequent, perhaps increasingly frequent, intervals in the future.

The following quotation is the last paragraph from the last address I have made to this day (November 6, 1968). It was a talk to a world congress, composed of societies from more than twenty-five different nations concerned especially with problems in communication and the language arts, held in Copenhagen, Denmark, during the first three days in August of 1968.

Lest my comments today and those of many other critics, both qualified and unqualified, during recent years cause you to doubt that

14. From address, "The Tides of Time," delivered at the Annual Convention of the International Reading Association in Boston in 1968.

scientific and scholarly study can contribute richly [to the improvement of education], let me urge you to reflect for a moment on the fact that we have had a trifling amount of it in comparison with many other fields, such as medicine, agriculture, and mechanical engineering. Educational research has lived on the crumbs during my days, but I believe that it is soon to join other groups at the table. Indeed, it has already had at least a few substantial handouts. For example, in several recent instances the amount of money made available for *each* of a few short-time (two- to five-year) investigations has been greater than I received for all the research work I have carried out during my entire lifetime. If some of those in our field now show signs of getting indigestion from the unaccustomed feast at the main table, we need not worry. They will soon get adjusted to a rich diet. In a long run a bountiful table for scholarly and scientific study will provide much that we need to give full vigor to our profession. I hope especially that the members of the organizations which have honored me today will be assigned reserved seats at the main table and as a consequence will enjoy long, happy, and fruitful lives.[15]

A BIOGRAPHICAL SUMMARY

ARTHUR I. GATES. Born on September 22, 1890, at Red Wing, Minnesota; moved to Fortuna, California, in 1891.

Family. Married Georgina Stickland, 1920. Children: Robert Gaylord, 1929; Katherine Blair, 1934.

Education. Elementary and high school, Fortuna, California; University of California (Berkeley), B.L., 1914; M.A., 1915; Columbia University, Ph.D. (Psychology), 1917.

Occupational history. Teaching fellow in psychology, Columbia University, 1916-17; instructor to full professor, 1917-56; head, Department of Psychology and Research Methods, 1933-36; director, Institute of Educational Research, Section D, 1921-30; head, Department of Education Research in Advanced School, 1933-42; director, Division of Foundations of Education, 1948-56; professor emeritus, 1956—; supervisor, Institute of Language Arts, 1956.

Memberships and affiliations. American Psychological Association (president of Section on Educational Psychology, 1948-49); American Educational Research Association (president, 1942); American Association for Applied Psychology (chairman, Education Section, 1940); American Association for the Advancement of Science (chairman, Edu-

15. Published slightly revised as "Reflection and Return," in *Reading: A Human Right and a Human Problem,* Second World Congress in Reading, Copenhagen, 1968 (Newark, Del.: International Reading Association, 1969), pp. 9-14.

cational Division, 1932); National Academy of Education; Century Club.

Awards. Medals and citations for distinguished service from International Reading Association, 1961; American Educational Research Association and Phi Delta Kappa, 1964; American Psychological Association, 1967; Teachers College, Columbia University, 1968; and World Congress on Language Arts, 1968.

Part II

Selected Publications of Arthur I. Gates

Books

Psychology, Education, and Educational Psychology

1. "Recitation as a Factor in Memorizing." *Archives of Psychology* (ed. R. S. Woodworth) 26, No. 1 (1917): 1-104. (Ph.D. dissertation.)
2. *The Psychology of Reading and Spelling with Special Reference to Disability.* New York: Columbia University Contributions to Education No. 129. New York: Teachers College, Columbia University, 1922.
3. *Psychology for Students of Education.* New York: Macmillan Co., 1923 (rev. 1930).
4. *Elementary Psychology.* New York: Macmillan Co., 1925 (rev. 1928).
5. *Elementary Principles of Education* (with E. L. Thorndike). New York: Macmillan Co., 1929.
6. *Educational Psychology* (with Arthur T. Jersild, T. R. McConnell, and Robert C. Challman). New York: Macmillan Co., 1942 (rev. 1948).
7. *The Effect of Mothers' Diets on the Intelligence of Offspring* (with Ruth F. Harrell and Ella Woodward). New York: Bureau of Publications, Teachers College, Columbia University, 1955.

Reading and Spelling

8. *Spelling Difficulties of 3876 Words.* New York: Bureau of Publications, Teachers College, Columbia University. 1937.
9. *The Improvement of Reading: A Program of Diagnostic and Remedial Methods.* New York: Macmillan Co., 1927 (rev. 1935, 1947).
10. *New Methods in Primary Reading.* New York: Bureau of Publications, Teachers College, Columbia University, 1928.
11. *Interest and Ability in Reading: A Report of Investigations.* New York: Macmillan Co., 1930.
12. *Reading for Public School Administrators.* New York: Bureau of Publications, Teachers College, Columbia University, 1931.

13. *Generalization and Transfer in Spelling.* Bureau of Publications. Teachers College, Columbia University, 1935.

Diagnostic and Instructional Materials

14. *The Gates-Strang Health Knowledge Test.* (Complete Series). *Manual of Directions* (with Ruth Strang). New York: Bureau of Publications, Teachers College, Columbia University, 1925.
15. *A Reading Vocabulary for the Primary Grades.* New York: Bureau of Publications, Teachers College, Columbia University, 1926 (rev. 1935).
16. "The Gates Primary Reading Tests." *Teachers College Record* 28 (1926): 146-78. The first is cited; most recent (with Walter H. MacGinitie) was published in 1969.
17. *Gates-Russell Spelling Diagnosis Tests* (with David H. Russell). New York: Bureau of Publications, Teachers College, Columbia University, 1937.
18. *The Story Book of Nick and Dick* (with F. T. Baker and C. C. Peardon). New York: Macmillan Co., 1937.
19. *Methods of Determining Reading Readiness* (with G. L. Bond and D. H. Russell, assisted by Andrew Halpin and Kathryn Horan). New York: Bureau of Publications, Teachers College, Columbia University, 1939.
20. *The Ranch Book* (with M. B. Huber and Frank S. Salisbury). New York: Macmillan Co., 1943.
21. *Teaching Reading* (First in a series, "What Research Says to the Teacher"). Washington: Department of Classroom Teachers and American Education Research Association, 1953 (rev. 1962, 1967).

Articles

Psychology and Educational Psychology

22. "The Relative Predictive Values of Certain Intelligence and Educational Tests Together with a Study of the Effect of Educational Achievement Upon Intelligence Test Scores." *Journal of Education Psychology* 14 (1923): 517-40.
23. "A Critique of Methods of Estimating and Measuring the Transfer of Training." *Journal of Educational Psychology* 15 (1924): 545-59.
24. "The Nature and Educational Significance of Physical Status and of Mental, Physiological, Social and Emotional Maturity." *Journal of Educational Psychology* 15 (1924): 329-58.
25. "A Study of the Role of Visual Perception, Intelligence and Certain Associative Processes in Reading and Spelling." *Journal of Educational Psychology* 17 (1926): 443-45.
26. "The Nature and Limit of Improvement Due to Training." In

Nature and Nurture: Their Influence Upon Intelligence, pp. 441-61. Twenty-seventh Yearbook of the National Society for the Study of Education, Part I. Bloomington, Ill.: Public School Publishing Co., 1929.

27. "Observed Facts and Theoretical Concepts." *Journal of Educational Psychology* 19 (1928): 381-91.
28. "Contributions of Research to General Methods of Instruction." In *Scientific Movement in Education*, pp. 79-91. Thirty-seventh Yearbook of the National Society for the Study of Education, Part II. Bloomington, Ill.: Public School Publishing Co., 1935.
29. "Connectionism: Present Concepts and Interpretations." In *The Psychology of Learning*, pp. 141-63. Forty-first Yearbook of the National Society for the Study of Education, Part II. Bloomington, Ill.: Public School Publishing Co., 1942.
30. "The General Nature of Learning" (with G. Lester Anderson). In *Learning and Instruction*, pp. 12-36. Forty-ninth Yearbook of the National Society for the Study of Education, Part I. Chicago: University of Chicago Press, 1950.
31. "Educational Psychology, Twenty-five years of Educational Research" (with Arthur T. Jersild, Anne S. McKillop, Harry N. Rivlin, Edward J. Shoben Jr. and Goodwin Watson). *Review of Educational Research* 26 (1956): 241-67.

Reading

32. "An Experimental and Statistical Study of Reading and Reading Tests." *Journal of Educational Psychology* 12 (1921): 303-14, 378-91, 445-64.
33. "The General and Specific Effects of Training in Reading with Observations of the Experimental Technique (with Dorothy Van Alstyne). *Teachers College Record* 25 (1924): 98-123.
34. "Problems in Beginning Reading." *Teachers College Record* 26 (1925): 572-91.
35. "A Modern Systematic Versus an Opportunistic Method of Teaching" (with Mildred T. Batchelder and Jean Betzner). *Teachers College Record* 27 (1926): 679-701.
36. "Recent Developments in Diagnostic and Remedial Teaching in Reading." *American Educational Association Annual Report*, February 1935, pp. 83-91.
37. "Viewpoints Underlying the Study of Reading Disabilities." *Elementary English Review* 12 (1935): 85-90, 105.
38. "An Experimental Evaluation of Reading-Readiness Tests." *Elementary School Journal* 39 (1939): 497-508.
39. [Needed Research] "In Reading." *Journal of Educational Research* 40 (1947): 381-88.

40. "The Role of Personality Adjustment in Reading Disability." *Journal of Genetic Psychology* 49 (1941): 77-83.
41. "Character and Purposes of the Yearbook." In *Reading in the Elementary School* (Arthur I. Gates, Chairman), pp. 1-9. Forty-eighth Yearbook of the National Society for the Study of Education, Part II. Chicago: University of Chicago Press, 1949.

Part III

Biographical Essay on Arthur I. Gates

ROBERT E. TOSTBERG

Arthur Gates's autobiographical statement is an informative and instructive document. It sets forth, in straightforward fashion, those incidents and motives that have shaped his distinguished career and draws together certain conclusions distilled from his experience. It is, however, a modest recounting of his accomplishments. In this companion essay, I will introduce material that shows his stature among professional colleagues, present an examination of bases for his reputation, and put forward some tentative comments about leadership in American education.

The place of an individual in the history of American education is secured largely by his peers' assessments. A look at the public record provides ample evidence of Gates's professional reputation and the work upon which it is based. "I am probably the only man you know whose career was founded upon a yawn," said Gates in a recent address.[1] He was referring to his first published study, "Variations in Efficiency During the Day."[2] In the case of both the subject of that study and Gates's career, the yawn was followed by a period of increased activity, efficiency, and visibility. Studies that Gates and his collaborators conducted during the next half century have added substantially and significantly to the literature on reading research and instruction. In the judgment of those who have reviewed it, the work has been consistently sound. Note the appraisals of these careful observers of the field of reading. William McAndrew, reviewing *Psychology for Students of Education*, wrote, "Among the helpers this age is giving us in remarkable

1. Arthur I. Gates, "Science or Sanity?" *Phi Delta Kappan* 45 (1964): 297.

2. "Variations in Efficiency During the Day, Together with Practice Effects, Sex Differences and Correlations," *University of California Publications in Psychology*, Vol. II, No. 1, pp. 1-156.

numbers I think you will put Arthur Gates in the front rank. He has a genius for selecting facts that are pertinent and for putting them into form adapted for the schoolman's immediate use." [3] Of *Interest and Ability in Reading*, Miles A. Tinker said, "The development of a program of research dealing with materials and methods of the teaching of reading by Dr. A. I. Gates and his associates in the Institute of Educational Research of Teachers College has resulted in contributions that may be classified as among the most important appearing during the past decade. . . . Dr. Gates gives an outline of what promises to become one of our most effective method[s] of teaching reading." [4] Donald D. Durrell's judgment regarding *The Improvement of Reading* was that "this book is without question the best treatment of diagnosis and correction of defects in reading that has yet appeared." [5] Not only were Gates's books well received but—and this is perhaps a more telling indicator of his status—his individual studies have been regularly prominent and favorably discussed in the major longitudinal reviews of research on reading and reading instruction.[6]

Certain features of his work have been consistently noteworthy: his concern to supply a "factual" basis for reading instruction and his ability to make his findings applicable to classroom situations. These are the stuff of which his career has been made and on which his reputation has been founded. David H. Russell, in a biographical sketch written at about the time of Gates's retirement from Teach-

3. "Psychology That Beats the Morning Paper," *School and Society* 32 (1930): 779.

4. *Journal of Educational Psychology* 23 (1932): 73-74.

5. *Education* 56 (1935): 58.

6. See, *Ten Years of Research in Reading: Summary and Bibliography*, ed. Arthur E. Traxler and Margaret Seden (New York: Educational Records Bureau, 1941); *Another Five Years of Research in Reading: Summary and Bibliography*, ed. Arthur E. Traxler and Agatha Townsend (New York: Educational Records Bureau, 1946); *Eight More Years of Research in Reading: Summary and Bibliography*, ed. Arthur E. Traxler and Agatha Townsend (New York: Educational Records Bureau, 1955). See also articles under "Reading" in *Encyclopedia of Educational Research* 2d ed., Walter S. Monroe, ed. (New York: Macmillan Co., 1950); *Encyclopedia of Educational Research*, 3d ed., Chester W. Harris, ed. (New York: Macmillan Co., 1960); David H. Russell and Henry R. Fea, "Research on Teaching Reading," *Handbook of Research on Teaching*, ed. N. L. Gage (Chicago: Rand McNally & Co., 1963), 865-928 passim.

ers College, offered this assessment: "The desire to get at the facts has characterized most of Arthur Gates's professional work, a career marked by wide-ranging interests and tremendous productivity in general psychology and educational psychology as well as in the study of reading problems. . . . In the field of reading instruction Gates's original researches and wide-ranging writings have made him one of the most influential figures in the United States and throughout the world. . . . His [intrinsic] method, with some later variations, has become standard practice in most American schools. . . . It is no exaggeration to say that [Gates's] books largely changed reading from an isolated and mechanical exercise to a series of consecutive, meaningful, and zestful activities for American children." [7] That others who know his work well have come to similar conclusions regarding the value of his contributions to reading is indicated by two honors bestowed upon him during the past few years. One was the Citation of Merit Award presented in 1961 by the International Reading Association.[8] Also under the auspices of that association, he was chosen to receive, in 1968, the first World Congress in Reading Award for "his distinguished service and many contributions to a better understanding of the reading process and to reading instruction throughout the world." [9]

Further recognition has come from outside the ranks of reading specialists. In a 1957 issue of *Phi Delta Kappan*, Robert Beck counted Arthur Gates among those persons he saw fit to name as leaders in education during the period 1906-1956. Of Gates he said, "His research in learning, his studies in diagnostic and remedial reading, and his contributions to the field of testing place Dr. Gates among the education leaders of recent decades." [10] If one is to be judged by the company he keeps, it is worth noting that Gates appears

7. "Pioneers in Reading: Arthur Irving Gates," *Elementary English* 34 (1957): 397-98.

8. Arthur I. Gates et al., *Invitational Addresses, 1965* (Newark, Del.: International Reading Association, 1965), p. 2.

9. *Reading: A Human Right and a Human Problem*, ed. Ralph C. Staiger and Oliver Andresen (Newark, Del.: International Reading Association, 1969), p. iii.

10. Robert H. Beck, "Educational Leadership, 1906-1956," *Phi Delta Kappan* 37 (1956): 159-65.

(between Frank N. Freeman and Arnold L. Gesell) with Cubberley, Dewey, Hall, Rugg, Strayer, Thorndike, and others of similar stature.

Perhaps the most significant evidence of the reputation he now enjoys across a relatively broad spectrum of American educators is the honor accorded him in 1964 as the first recipient of the Award for Distinguished Contributions to Educational Research, now given annually by the American Educational Research Association and Phi Delta Kappa. The plaque presented to him on that occasion reads:

> Distinguished contributor to educational research, author of the seminal study of recitation as a factor in memorizing, and of many basic investigations in reading, influential leader in improving practices, his scholarly career has had profound influence on education.[11]

The judgment is clear and conclusive. Arthur Gates is, by consensus of his professional colleagues, a leader in American education.

Dankwart A. Rustow, in an issue of *Daedalus* given over to studies in leadership, has noted, following Erik Erikson, that the role of a leader "must be explained concurrently on two distinct levels: the personal or psychological and the social or historical." [12] It is tempting to undertake an examination of Gates's leadership in these two dimensions. Even more intriguing is the prospect that the connectionist psychology espoused by Gates might prove to be a useful conceptual tool for explaining the behavior of this leader. A more modest, more manageable, and for the purposes of this volume a more pertinent inquiry, however, is to ask about the basis for Gates's recognition as a leader. Though his autobiography provides an abundance of descriptive material about his professional life, and judgments proffered about his work contain references to his accomplishments, a closer examination of certain features of his career may help to understand better how it is that Arthur Gates has come to be seen as a leader in American education.

Consider first the timing of that career. When Gates began his

11. American Educational Research Association, *Newsletter* 15, No. 2 (1964): 6.

12. "Introduction" of the issue "Philosophers and Kings: Studies in Leadership," *Daedalus* 97 (1968): 688.

studies of reading, he was entering a field that was, at best, embryonic. His investigations took him into an area that was, as a focus for scholarly endeavor, not yet clearly differentiated from its progenitors, psychological research and general pedagogical method. He has described his decision to pursue a career in research as a choice between science and sanity. His recollection that "to choose to become a psychologist, then regarded by many as some kind of vagrant mind-reader, was to family and friends sheer insanity" [13] dramatizes the novelty of taking seriously even psychological research as one's lifework. When it is further recognized that the first doctoral dissertations in American universities to deal explicitly with reading appeared in 1917 [14] (the year of both Gates's and William S. Gray's studies), Gates's place as a pioneer in the scientific study of reading is patent.

As important as the circumstances of his entry into the field is the duration of his concern. For over half a century now, Gates has been intensively involved in and widely identified with psychological and pedagogical studies that pertain to reading. Three of his major books illustrate the focus of scholarly interests that he has sustained. *Psychology for Students of Education, The Improvement of Reading,* and *New Methods in Primary Reading,* all published initially before 1930, represent areas of inquiry that he has developed and elaborated upon. Not only has he contributed substantially to answering questions about reading, but he has been instrumental in forming the fundamental questions to which students of reading have addressed themselves for over half a century.

Another important facet of Gates's career is the extraordinary visibility that he and his ideas have gained through his publications, his institutional location, and his professional affiliations. The sheer quantity of his published works (currently about three hundred books, articles, and addresses) would be enough to establish him as a paramount figure in the field of reading research and instruction. Since 1921, six yearbooks of this Society have dealt explicitly with reading. Taken together, they provide both a history of the study of reading and a register of the persons who made that history; the

13. Gates, "Science or Sanity?" p. 297.

14. This date is assigned by Nila Banton Smith in Gates, et al., *Invitational Addresses, 1965,* p. 38.

four most recent of those volumes include contributions by Gates.[15]

If he had intentionally sought a place in which to be highly conspicuous, what better location could he have chosen than Teachers College during the era of its greatest renown? There, for forty years, in the company of Cattell, Thorndike, Woodworth, and others of equal eminence, he occupied a platform from which he could be seen and heard by a vast audience of American educators. It takes nothing away from Gates to suggest that his association with such colleagues contributed, initially at least, to his gaining prominence in a number of important professional organizations. Just to list some of those organizations and the offices he has held in them is to be reminded of his peers' view of him: American Association for the Advancement of Science, chairman and vice president of Section Q (Education), 1925; American Association of Applied Psychologists, chairman of Education Section, 1940-42; American Educational Research Association, president, 1942-43; American Psychological Association, president of Educational Psychology Section, 1948-49. A highly visible figure, indeed.

These features of Gates's professional life must be seen against the background of certain broader developments in American education with which his career has been contemporaneous and closely interwoven. Particularly important is his relationship to the movement called "the scientific study of education." The theme of scientific investigation is a primary one in his career choice, his publications, and his professional affiliations and, most significantly, it serves to set his work firmly in the context of a movement that reflects the dominant persuasion of American educators during the twentieth century. Whatever the subject of inquiry and whatever the technique of investigation, proponents of the scientific study of education have generally agreed that, as a coherent movement, it has been

15. *The Teaching of Reading: A Second Report*, Thirty-sixth Yearbook of the National Society for the Study of Education, Part I (Bloomington, Ill.: Public School Publishing Co., 1937); *Reading in the High School and College*, Forty-seventh Yearbook of the National Society for the Study of Education, Part II (Chicago: University of Chicago Press, 1938); *Reading in the Elementary School*, Forty-eighth Yearbook of the National Society for the Study of Education, Part II (Chicago: University of Chicago Press, 1949); *Development in and Through Reading*, Sixtieth Yearbook of the National Society for the Study of Education, Part I (Chicago: University of Chicago Press, 1961).

"an effort to secure as exact information as possible to serve as the basis for practice." [16] This is a succinct statement of the informing concept underlying Gates's scholarly studies and pedagogical prescriptions and, as noted in his autobiography, it is the answer he developed to Dean Russell's question about the relative merits of the "academic" and "professional" mind. The suggestion made earlier in this essay that Gates has been a force in marking out certain domains of inquiry with regard to reading does not imply that he has provided definitive answers to the questions raised, nor that he has claimed to have done so. On the contrary, he has regularly maintained that there are many ways to teach reading, perhaps as many as there are pupils to be taught. What he has advocated, however, is that rigorous, systematic methods of investigation should be utilized, that research must provide the basis for every program of reading instruction, and that further scientific study is prerequisite to progress in all educational practices. Though constant in his praise of method, Gates's own approaches to educational research have varied over time. In a retrospective address to the International Reading Association in 1968, he said, "my first love was the analytical, experimental, and theoretical psychology. . . . [During the] years I still regard as my best, I used these approaches as my primary ones. . . . [Later, for reasons of efficiency] I shifted more and more to the mass-statistical approach. . . . [But now] I would happily return [to the] analytical-experimental . . . approaches." [17] If a dispassionate investigator is permitted one passion, "method" has been Gates's. Given this identification with the scientific study of education and the honorific status accorded science by American educators, Gates's visibility within that movement takes on the aura of esteem.

These points regarding Gates's prominence and importance might be emphasized by contrast. If the first five decades of the twentieth century are taken as the era of Progressive education and the scientific study of education is viewed as part of that complex movement, then one might expect that a person of Gates's stature would enjoy

16. Frank N. Freeman, "Introduction," *The Scientific Movement in Education*, Thirty-seventh Yearbook of the National Society for the Study of Education, Part II (Bloomington, Ill.: Public School Publishing Co., 1938), p. 2.

17. *Reading*, ed. Staiger and Andresen, p. 13.

similar repute across a wide range of Progressive educators. This seems an especially plausible assumption when it is recalled that Gates, in his autobiography, acknowledges his general agreement with the pedagogical point of view expressed by Dewey and Kilpatrick and when it is noted that the persons and ideas that make up the several strands of progressivism have overlapped and intertwined throughout Gates's professional life. But such, apparently, is not the case. Neither the writings most often taken as representative of Progressive education nor subsequent historical accounts of that much studied movement give significant notice to Gates. This is not to suggest that he has not been, in some sense, a "progressive" educator, but only—and most importantly— that he has stood in a different relationship to other groups of educational reformers than to his own primary reference group.

Other persons concerned to improve the condition of American education (principal among them some of Gates's Teachers College colleagues) set out to remake American society and its intellectual foundations or to secure for the child a new and central role in the scheme of things educational. While Gates was collecting evidence on which to base new methods for teachers of reading, George Counts was daring the school to build a new social order, John Dewey was reconstructing philosophy, and Harold Rugg was promoting the child-centered school. During a period of widespread reexamination of matters both internal and external to schooling, Gates put his professional energies into trying to provide a better knowledge base for the teaching of reading, a set of abilities that he has considered foundational to all formal education and, thus, fundamental to enhancing the quality of living, in both its individual and social dimensions.

Those reformers who focused their attention on factors external to the psychological laboratory and the classroom were heavily involved with political questions and ideological conflicts. Gates was not; it would seem fair to characterize his interests and his activities as apolitical and nonideological. Perhaps partly because he did not engage in the rhetoric of radical reform, he has not been a controversial figure. He has, with regard to major issues, taken the position of moderate—sometimes moderator—or, to use his own term, "nonsectarian." His "on-the-one-hand-but-on-the-other" assessment of

the "activity movement" at a time when it was the center of vigorous debate illustrates this stance.[18]

Considered comparatively, then, Gates's reputation turns out to be a function of the setting in which his career is viewed. In the community of scientific investigators of education, he is paramount and highly regarded. In the community of social reformers of education he is, in a word, undistinguished.

The notion I am advancing is that leadership is contextual and contingent and that, in order to account for Gates's stature as a leader, the primary contexts in which he has spent his public, professional life and the relationships upon which reputation depends must be given first consideration. In Gates's case—using evidence from his own record of his career, his published works, and public reports of his reputation—the relevant background is the scientific orientation of that group of educators with which he has been most closely identified. That is the setting, both substantive and normative, for his professional activities. There his contributions have been recognized as appropriate and judged according to criteria generally agreed upon. It is the conjunction of visibility and value within his primary reference group that constitutes grounds for Gates's acclaim as a leader in American education.

Gates himself has suggested my concluding point. He notes, in his autobiography, that the value of particular research studies, curricular materials, or teaching methods is dependent upon their time and circumstances. That observation seems pertinent to the matters considered in this essay. To paraphrase both Gates and the authority he cites: "Sufficient unto the day the [educational leadership] thereof."

18. "Statements by Various Members of the Committee," In *The Activity Movement*, Thirty-third Yearbook of the National Society for the Study of Education, Part II (Bloomington, Ill.: Public School Publishing Co., 1934), 189–90.

LEADERS IN AMERICAN EDUCATION

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