

## THE MAKING OF A STATE SCIENTIST— THE PREPARATION OF LUCIUS POLK BROWN, 1867-1908

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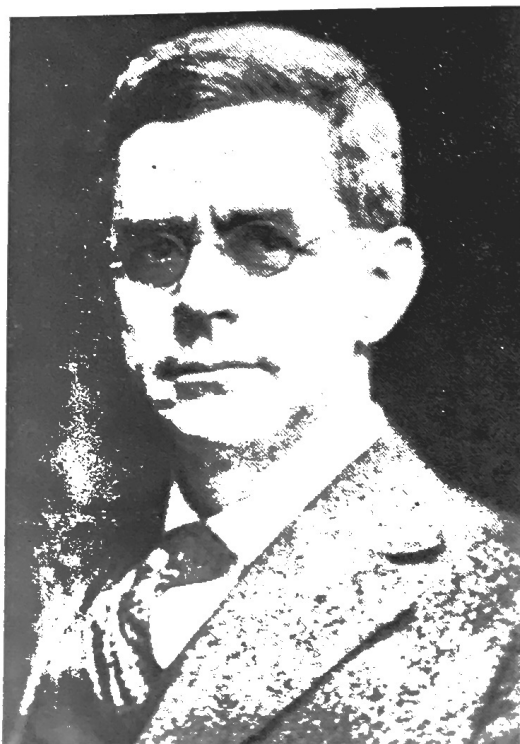


FIG. 1: Lucius Polk Brown: c. 1915

### ABSTRACT

By the end of the nineteenth century, science as a discipline had undergone the process of professionalization. Historian George H. Daniels has noted at least four distinct stages: preemption, institutionalization, legitimation, and the attainment of autonomy. Obviously, the professionalization of this discipline had an impact on individuals who sought admission to the guild. Lucius Polk Brown, Tennessee's outstanding chemist during the Progressive Era, entered government service as a professional chemist *vis-à-vis* the route mapped by his profession. Because his preparation was not unlike that of other scientists who entered government work, he serves as a prototype for studying the impact of professionalization on the scientifically oriented individual by the turn of the twentieth century.

By the latter part of the nineteenth century, the scientific community in America had entered the realm of professionalization. Historians who have studied this phenomenon note various stages through which a disci-

pline passes to attain this level of sophistication. As a process, professionalization begins when the gentlemanly amateur is replaced by a trained specialist, giving rise to tensions within the interested community. Thereafter, according to scholar George H. Daniels, at least four distinct stages which overlap and interact may be discerned. They include preemption, institutionalization, legitimation, and the attainment of autonomy. Preemption represents a subtle change distinguished by the manner in which a task once performed by everyone in general becomes the prerogative of the few. The knowledge required for performance of the task is esoteric, and those who possess the privileged information soon argue for the necessity of a formal, specialized education. Second, institutionalization materializes as a factor in professionalization when the insiders attempt to regulate themselves. This results in the formation of tight-knit societies, first at the local level and later at the national and international scale. Next, legitimation transpires when the possessors of esoteric

knowledge attempt to secure public support by justifying their *raison d'être* on the basis of their value to society. Autonomy, the final stage of professionalization and the most difficult if not, in fact, almost impossible goal to achieve in a democratic society, theoretically occurs when the discipline transcends external controls, regulates the behavior of its own members, and halts efforts to justify its existence (Daniels, 1967).

The course of science from amateurism to professionalization proceeded systematically during the nineteenth century. Scholars preempted various bodies of knowledge breaking science down into a number of specialized categories, formed their respective societies, and received recognition as a legitimate elite. The alternatives for the professional scientist varied. Teaching, preferably at the university level, proved attractive for some; industry likewise had some allure. A few scientists chose self-employment in a consultative capacity. Government service, however, drew some of the most dynamic and politically oriented individuals. Passage of the Hatch Act in 1887, creating state agricultural experiment stations and providing aid to those already in existence, was a boon to the profession because it established positions in the area of agricultural science, substantially increasing the number of science-related jobs to be had in government. Chemists especially were drawn to this service. As the stations grew in importance, their work magnified in scope to encompass additional responsibilities including analysis of milk, seed, and fertilizer. Eventually a concern for the purity of food, water, and drugs likewise entered the domain of the agricultural scientist. (Dupree, 1957).

Obviously, the professionalization of a discipline made its imprint on individuals who sought admission. Lucius Polk Brown, Tennessee's outstanding chemist during the Progressive Era, entered government service as a professional chemist *vis-à-vis* the route mapped by the guild. His education and his experience, meeting the demands of the profession, paved the way for his subsequent success as the state's first pure food and drug commissioner from 1908 to 1915, vice-president and president of the Association of State and National Food and Dairy Inspectors from 1909 to 1912, director of the Bureau of Food and Drugs in the New York City Department of Health from 1915 to 1920, and a participant in a number of national conferences related to public health. Because his preparation was not unlike that of other scientists who entered government work, Brown serves as a prototype for studying the impact of professionalization on the scientifically oriented individual by the turn of the twentieth century.

Born at Hamilton Place in Maury County on April 1, 1867, Brown was a member of two prominent families of Middle Tennessee, the oldest of five children produced by the union of George Campbell Brown and Susan Polk Brown. Of English origin, the Browns had migrated to America in the eighteenth century from Northern Ireland. Their founder in the United States, John Brown, a Presbyterian minister, settled in Augusta County, Virginia and established Liberty Hall Academy, the forerunner of Washington and Lee University. Lucius Polk Brown's great-grandfather, George Wash-

ington Campbell, was secretary of the treasury under President James Madison, first minister of the delegation to Russia under President James Monroe, and a senator from Tennessee; his grandfather, James Percy Brown, served as an attaché to the American embassy in Paris. On the maternal side, Brown's ancestors had likewise earned impressive reputations. His great-grandfather, Colonel William Polk of Mecklenburg County, North Carolina, fought alongside General George Washington during the Revolution. Other admirable family members included great-uncle Leonidas Polk, Confederate general and Episcopalian bishop, and cousin James K. Polk, president of the United States (Biographical details).

As a youth, Brown lived with his parents on Ewell Farm at Spring Hill. Although much of his childhood paralleled the difficult years of Reconstruction, he grew up in an atmosphere of gracious country living in the southern tradition. He had the advantage of a quality preparatory education in private schools including Montgomery Bell Academy in Nashville and a high school at Bellvue, Virginia. His family was not wealthy, but it was financially secure because of its landholdings. The Browns had managed to retain more than eleven-hundred acres as a result of the restraint exercised by a wise executor when the widow Elizabeth McKay Brown wanted to invest in Confederate bonds. In 1867, this same lady, by then the wife of General R. S. Ewell, brought the first registered Jersey cow to Tennessee. Her interest in this particular breed contributed to the success of her son Campbell as a stockbreeder and farmer and the bent of her grandson Lucius toward chemistry. As dairymen, the Browns placed high priority on production standards. Chemical analysis held the key for determining the quality of milk.

A natural concern for matters related to the family livelihood turned Lucius Polk Brown toward a career in chemistry. Personal interest alone, however, was not enough to qualify an individual for the chemical profession. In the autumn of 1885, when he was eighteen years old, he enrolled for his first year of study at the University of Virginia. This signaled the beginning of his preparation as a professional chemist, for it was at the University that he acquired the knowledge and certificates then required. He obtained neither a professional degree nor a titled academic degree during his residence in Charlottesville. Instead, Brown pursued a course of study which resulted in his receipt of untitled "degrees" in chemistry and related sciences, an alternate program offered by the University of Virginia at that time. During his freshman term, he registered for the usual liberal arts subjects including history, physics, Anglo-Saxon, and modern English, for which he was awarded certificates of proficiency at the commencement ceremonies in June, 1886. The certificate of proficiency was one of the untitled "degrees" earned by students who demonstrated on examination a competency in schools where different branches of study could be attended separately (Brown at the University of Virginia).

The second year, Brown entered a program which was to prepare him for entry into a profession to which he

was directly or indirectly attached for the remainder of his life. Beginning with the 1886-87 session, his last two years provided his formal training in chemistry. In June, 1887, he received diplomas of graduation in analytical, agricultural, general, and industrial chemistry. The diploma of graduation was yet another of the untitled "degrees" which indicated that a student had passed an examination of broader scope than that for the certificate of proficiency. Apparently Brown did not return to the University for the 1887-88 session, but in the autumn of 1888 he was again enrolled, this time in the schools of analytical chemistry, biology and agriculture, natural history and geology, and mathematics. This year of study culminated in his receipt of a certificate of proficiency in biology and agriculture and a diploma of graduation in geology and mineralogy. His college days, however, were not all spent in the laboratory. The handsome, broad-shouldered, brown-eyed young man also played football, rowed, and boxed. These activities in no way detracted from his scholarly pursuits. Brown's rapid progress was acknowledged by his professors who recognized him as an able, conscientious student especially excellent in his laboratory courses.

It 1889, Brown left the University of Virginia and returned to his native state. For the next four years his time was divided almost equally between farming and chemical experimentation in scientific agriculture. His contacts with farming had remained open during his student days because his father wrote to him often informing him of developments at Ewell Farm and consulting with him on the type of stock he might purchase to improve the bloodlines of his dairy herd and racing animals (James D. Hoskins Library). His return to the farm did not preclude his scientific interests, for he soon began laying foundations for his career as a chemist. The farm, however, did not provide enough opportunities for an aspiring young scientist; the city held more possibilities. Therefore, in 1889, Brown moved to Knoxville. Nestled in the mountains of East Tennessee, it had a population of only 22,535 in 1890 making it Tennessee's fourth largest city. Nevertheless, Knoxville was a rapidly growing industrial, business, and social center. It was also the site of the state university and the newly established agricultural experiment station.

Rapid changes characterized the atmosphere of the University during the late 1880s and early 1890s. Dr. Charles Dabney became president in 1887. In a program of sweeping reform, he fired all but two members of the faculty. His new appointees were outstanding in scholarship and character. In addition to revamping the faculty, one of his most difficult tasks was suppressing the resentment of the Liberal Arts staff for the attention given the College of Agriculture or as they termed it, the "Cow College." The "Cow College" had taken on increasing importance in 1887 when the Board of Trustees reorganized it according to government specifications set forth in the Hatch Act (Creekmore, 1964).

In October, 1889, Brown secured employment as acting chemist at the agricultural experiment station.

Then in its infancy, the station itself had been established only since July, 1887; but the embryonic laboratory of the chemical division had been in operation only nine months when Brown became its director. His official duties included analysis of milk samples to determine butterfat content, comparison of varieties of sorghum to find the type best suited to the climate of Tennessee, and investigation of fertilizers believed to be fraudulent (TAES, 1890).

Socially, Knoxville and particularly the University must have provided interesting entertainment for Brown. Knoxvilleans flocked to events on the campus. Debates, moot courts, and graduation exercises were always popular. The College of Agriculture sponsored attractions of its own including an annual strawberry festival where berries grown by students were served in a variety of ways to eager visitors. The pleasant interlude of professional work soon ended. Brown's direct affiliation with the experiment station terminated with his resignation as acting chemist effective July 1, 1890.

Campbell Brown, now aged and occasionally ill, required the services of his son back at Ewell Farm. Nonetheless, the promising young chemist continued his work on methods for determining the content of butterfat in milk, especially those which could be adapted to the needs of the dairy farmer. He drew subjects for his experiments from the dairy herds of his prominent Middle Tennessee neighbors. Not content with his finds alone, he sought knowledge of the results of similar tests conducted at other state agricultural experiment stations, particularly the one in Kentucky where M. A. Scovell directed significant experiments. In 1893, Campbell Brown died leaving Ewell Farm in the capable hands of his eldest son who had been closely involved in operations there for the preceding three years. The responsibilities Brown assumed left him little time for his chosen profession.

An ambitious man of varied interests and immense energy, Brown soon tired of the limited life of a farmer. Being an astute observer of contemporary events, he probably noted the rapid strides that the country was making toward urbanization. He, no more than the society in which he lived, could escape completely the rural heritage or resist the lure of urban dynamism. Now, in his late twenties, he decided that the time had come to advance his career as chemist. Nashville, in close proximity to Ewell Farm, became his base of operations.

Tennessee's largest city and capital consisted of 76,168 people in 1890, representing a major commercial and wholesale market between the Ohio River and the Gulf of Mexico. Life in Nashville during the "Gay Nineties" had its gaiety diminished by the depression, but in spite of economic difficulties, Nashvillians could not have helped but notice the decisively urban qualities their city had taken on. The numerous buildings, the rapid suburban expansion, the business conducted there, and the smoke billowing out of soft-coal furnaces polluting the air legitimized claims of urbanization. Along with the metropolitan attributes were holdovers from the less sophisticated country town. Most of Nashville's inhabitants walked to work, to market, and

to school; the wealthier citizens had not yet fled the downtown; and cows still grazed from 6 a.m. to 6 p.m. in certain designated areas (Waller, 1970). It was to this town in transition that Brown went in search of opportunities for advancement as a professional chemist.

In 1894, Brown became a partner in the laboratory of Memminger & Brown and eventually assumed ownership and the presidency changing the name to Lucius P. Brown & Company, Analytical Chemists. From 1894 to 1908, his career advanced rapidly and he established a solid reputation as an able chemist. Routine analysis consumed much of his time during these years, but his association with several companies as an outside consultant and in the position of director provided him with opportunities for travel and expansion of knowledge. For a time, he served as director of the Harley Pottery Company and the Hurricane Iron & Mining Company. His interest in geology and positions in these companies led to prospecting ventures including work with phosphates in Tennessee and Florida over several years, rutile in Virginia during 1903, and some interest in the minerals of Idaho where he spent the summer of 1904.

For the ambitious individual, self-satisfaction with his own work is rarely enough reward. He must also receive the recognition and approval of his peers. Graduate or advanced education, membership in professional organizations, and publication of articles and books are the logical means of drawing attention. Brown conformed to expectations of his profession. After he joined the firm of Memminger & Brown, he met additional educational requirements. Vanderbilt University located in Nashville conveniently provided him with the opportunity to do more course work. He enrolled there as a graduate student in chemistry during 1897-98. In addition to study in chemistry, he may also have done special work in economic geology. From 1894 to 1908, he sought and obtained membership in scientific organizations, among them the American Chemical Society and the Engineering Association of the South as well as state and local societies. He joined additional more highly specialized associations during later years. Although his responsibilities and interests substantially increased over the years, he managed to find time for scholarly writing and publication. "The Phosphate-Rock Deposits of Tennessee," an article related to the mining of phosphates, their qualities, compositions, and uses, appeared in *Engineering Magazine* during 1896-97. He contributed other articles relating to phosphates to a French journal devoted to that subject. Earlier, while at the University of Tennessee Agricultural Experiment Station, he did some writing which was published in cattlemen and breeders' magazines.

Since 1894 Brown had been self-employed in a private company which offered consultative services. For a decade he had held no political office, elective or appointive, and apparently kept himself out of any major participation in politics. Various government agencies at the city, state, and federal level had created positions for scientists during these years, and apparently such

employment had some attraction for Brown. The state administration in Tennessee included a position for a chemist in its Bureau of Agriculture. Perhaps because of his brief association with government work as acting chemist at the University of Tennessee Agricultural Experiment Station or simply because of a desire for additional income, he became involved with a public office. In 1903, he performed the duties of the state chemist apparently as he had done for at least four years. George A. Shwab, the nominal holder of the position, had other obligations and therefore delegated his responsibilities to Brown. On January 14, 1903, Brown made formal application to Democratic Governor James Frazier for recognition as state chemist. The governor complied, and for a short period during 1903 he was officially the state chemist (Brown's tenure as state chemist).

Because of his tenure as state chemist, Frazier asked Brown to represent Tennessee at a meeting of the National Association of State Dairy and Food Departments to be held in St. Paul, Minnesota from July 21-24, 1903. Robert M. Allen, head of the Food and Drug Division at the Kentucky Agricultural Experiment Station and secretary of the association, had suggested to the governor that either the director of the state experiment station, the chemist at the station, or the state chemist be appointed to attend the convention for purposes of discussing food adulteration, uniform state food laws, and the passage of national legislation. Brown did not attend because he was in New York and learned of the appointment one day before the meeting was scheduled to begin. In a letter to the governor, he indicated that he would have attended if he had known about the invitation in time to make plans. His professional interests by 1903 definitely included government service as a specialist on food and drugs. When the eighth annual convention of the food officials met on September 26, 1904, Brown represented Tennessee. Beginning in 1904, his career was intricately laced to this organization. In 1907, when his state took legislative action to create the position of state food and drug inspector, he was the most eminently qualified chemist in Tennessee.

In little more than two decades, Brown had traversed the course required of a professional chemist seeking entry to government service. He had fulfilled educational requirements and acquired invaluable experience in different areas including agricultural chemistry, private business as a consultant chemist and geologist, and limited employment as state chemist. In the profession, his status was sound. He enjoyed membership in scientific associations and contributed articles to various journals. En route to professionalization, he had sought out opportunities in urban areas of the South without completely severing all ties with rural life. The serenity of the countryside provided Brown with relaxation and the setting for the pursuit of his hobbies, among them horseback riding, photography, and stockbreeding. Urban-oriented by 1907, he was a professional scientist on the verge of entering the stormy arena of Tennessee politics.

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## “NEW MONKEY LAW” STRUCK DOWN

Just over 50 years after a Dayton, Tenn. high school biology teacher, John Scopes, was fined \$100 for teaching evolution in violation of state law, the latest legal barrier to public school acceptance of the theory was struck down. A Federal judge and the Tennessee Supreme Court declared unconstitutional a 1973 law requiring biology textbooks to provide equal space to Biblical and scientific theories.

In a stinging rebuke, U.S. District Judge Frank Gray, Jr. ruled “Every religious sect, from the worshippers of Appollo to the followers of Zoroaster, has its belief or theory. It is beyond the comprehension of this court how the legislature, if indeed it did, expected that all such theories could be included in any textbook of

reasonable size.” To provide equal space to religious theories in public school texts would violate First Amendment guarantees of separation of church and state, Judge Gray decided.

Earlier, the Tennessee Supreme Court had affirmed a ruling by a county official that the “New Monkey Law” violated both state and Federal constitutions. One district Federal court had failed to act on the case, but a Court of Appeals ruled such abstention was inappropriate.

(Scopes' conviction in the famous 1925 trial was eventually overturned because the fine had been set too high, but the original “Monkey Law” remained on the books for many years.)

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