SCIENCE AND THE "DISCIPLES OF PROGRESS": CREATION OF THE FIRST KANSAS GEOLOGICAL SURVEY, 1864

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During the westward movement of the American frontier, science and the pioneer maintained an uneasy liaison. Science seldom appeared on the frontier until more pressing economic necessities were taken care of, and then its appearance usually coincided with flush economic times during which legislatures felt they could afford to invest money in research. Among the earliest and most important forms of state-supported science in the United States were geological surveys, institutions designed to provide a geologic reconnaissance of the state; usually surveys were directed to learn more about economically important minerals, although at times they made contributions to basic knowledge of stratigraphy and other facets of geology.

Kansas created its own geological survey in 1864, but there were at least four earlier efforts to fund a formal geologic reconnaissance, representing remarkable attempts at science in a state so embroiled in the problems of the frontier and the slavery/abolitionist dispute. Too much can be made of these attempts: in Kansas, legislative interest in science was limited almost completely to geology, at least until the foundation of state-supported universities, and geology roused concern only because of the economic returns it seemed to promise. But that early flirtation with state-supported science remains significant.

Kansas was hardly the first state to conceive of a geological survey. The idea appeared in Europe around 1700, and first manifested itself in the United States in 1823 when Denison Olmstead—trained at Yale by Benjamin Silliman, Sr.—undertook a study of North Carolina’s rocks and minerals. The first full-blown
Three attempts were made before Kansas was a state to provide a geological survey of the territory, which at that time stretched west well into present-day Colorado. When Kansas became a state in 1861, organizers lopped off a large western section that extended into the Rocky Mountains—the section that was probably the most geologically interesting in the territory. Still, that grand giveaway did not stifle attempts to create a geological survey in Kansas, and in 1864 the legislature authorized the first state survey. This Gunn & Mitchell map, first published in 1859, shows “Routes From the Missouri River to the Kansas Gold Mines.”

A state-supported survey appeared seven years later in Massachusetts, and in the period from 1830 to 1860 22 states funded surveys of one sort or another and for various durations with seemingly only one commonality: surveys flourished, for the most part, when the economy was healthy and their existence was threatened when times were hard. In spite of lofty speeches about the glories of scientific knowledge, most legislators felt they could risk money on state surveys only when they could afford to lose it. And even though the funders realized surveys were a gamble, they always expected hard and practical returns. Those great expectations led to an immediate conflict in many states: geologists in charge of state surveys often wanted both practical results and new scientific findings. At times they were able to do both, usually falling somewhere between the extremes of pure and practical research. At other times they moved to the side of basic science and made a number of important contributions to the emerging discipline of geology. Yet in most cases state government demanded and received an emphasis on practical results, sometimes to the exclusion of pure research altogether.

In some states this relationship of science and government was successful, resulting in a graceful and productive dance of cooperation. But in Kansas, government and science stalked each other, circling eye-to-eye before embracing, and even then the partnership was short and fitful. The first attempt, in 1854, was made not by Kansas territory but by the federal government. Congress considered a bill authorizing the construction of territorial roads and bridges, the improvement of rivers, and a geological survey of the territory, which stretched well into present-day Colorado. The house of representatives deemed most of the bill “inexpedient” although it did appropriate money for improvement of roads.


The second attempt came a year later when the territorial legislature tried to persuade Congress to change its mind about the expediency of a geological survey. The legislature's committee of agriculture was instructed to "report by resolution, petition, or memorial to Congress in favor of a Geological Survey of Kansas Territory." Known as the bogus legislature, this body was probably elected by more Missourians than Kansans, another casualty in the border war over slavery. Perhaps because of the legitimacy of the body making the request, or more probably because Congress still considered a survey unnecessary, the second attempt also died.

Attempt number three waited until two years later, during the 1857 session of the legislature, when territorial Gov. John W. Geary included a request for a geological survey in his message to the lawmakers, calling a survey "...so necessary as merely to require notice. Provision for this useful work should immediately be made." Geary's relationship with the legislature was not good, however, and the beginning of a survey obviously required more than mere notice. No bill was introduced and no survey created. Geary left office—and Kansas—several months later, marking the last formal effort to establish a survey in territorial Kansas.

The territory became a state in 1861, and in the process of determining the state's borders, organizers lopped off a large section of western Kansas that extended into the Rocky mountains and is now part of Colorado. Ironically, they had shorn away an area that was probably the most geologically interesting in the territory, and an area whose geology could have made major economic contributions through gold and silver deposits. Still, that grand giveaway did not stifle attempts to create a geological survey. In 1863 state Rep. D. T. Mitchell of Lecompton introduced house bill 189 establishing a geological survey; it survived a second reading in the house before failing. This marked the last unsuccessful attempt at a survey prior to 1864.

It is difficult to gauge the popular support for any of these proposals. There were occasional newspaper comments supporting some of the legislation, but they hardly amounted to a

clamor from the press. Even though the scarcity of geologic materials for housing and fuel seemed to weigh on the minds of pioneer Kansans, there was certainly no evidence of a public outcry supporting a geological survey during those four fruitless tries. But there was a perceptible change in attitude during those years. Small at first, it grew to make a crucial difference, so that the proposal of 1864 elicited more popular response, both in the newspapers and in letters from citizens, than any of the previous attempts. Perhaps in the years from 1854 to 1864 the state’s population became more aware of the problems invoked by geologic ignorance. Too, the Kansas economic climate improved in 1864 to the point that legislators must have felt they could risk funds on a scientific enterprise. And finally, perhaps the combination of supporting personal was sufficiently strong and in the proper mix to aid the survey’s passage. For those reasons, and perhaps others, the attitude toward a survey and science had changed enough that the 1864 proposal did not suffer the same fate as its earlier relation.

CERTAINLY the political process that created a survey was the most elaborate and drawn out of all the attempts, filled with intrigue, twists and turns, and old-fashioned political horse trading. It began with Gov. Thomas Carney, a rather unlikely sort who had demonstrated no inordinate interest in the problems of science or geology. Born in Ohio, Carney built a thriving wholesale business before moving west to Leavenworth in 1858. Elected to the Kansas legislature in 1861, Carney won the governorship in 1863 with the support of Charles Robinson, and presided over the state for two years. Though he held office during some of the most turbulent times in Kansas history, Carney—whose picture has an almost priestly, calm air about it—was able to run a stable and solid administration and for the most part was able to protect Kansas through the treacherous years of early statehood and Civil War. Carney had a number of legislative successes, most notably support for establishing the state university at Lawrence, and the state agricultural college at Manhattan.

The survey’s creation was less noted by contemporaries. Carney introduced the subject in his 1864 message to the legislature, and based his defense of a survey appropriation on the state’s ignorance of minerals, the need to classify soils for agricultural purposes, and especially the demand for coal: “The almost fabulous prices which fuel commands in our cities and principal towns must retard their growth, and occasion distress and suffering among the poorer classes.” Carney concluded that because “The wealth of Kansas lies in her soil ... it seems to me eminently proper that this subject [a geological survey] should engage your careful and considerate attention.”

The matter received attention almost immediately, though that attention was not always considerate. Four days after Carney’s speech, Rep. J. B. Laing from Leavenworth introduced a bill appropriating $3,500 for a geological survey. Entitled “An Act for establishing a geological survey,” house bill 10 charged the survey with classifying soils and rocks, analyzing salt springs, reporting on valuable mineral deposits, and collecting and labeling a geological cabinet, illustrating the geology of Kansas. The bill was referred to the five-man committee on agriculture, manufacture, and mining.

Most state newspapers gave the bill a polite, and in some instances, enthusiastic reception. In nearly all cases that enthusiasm was based not so much on what might be learned from such a survey, but instead upon how that knowledge might be applied. “The age in which we live has brought to clear light the fact that the sciences may be applied to agriculture and the various branches of common industry,” wrote John Speer in the Kansas Tribune at Lawrence, “with most favorable results ... it is a fact that this State, notwithstanding it has been travelled over so much, is still terra incognita, in the strict sense of the term.” Chimed in the Leavenworth Daily Conservative, “It is to be hoped that the bill will be liberal and thorough in its provisions.”

But the house committee was hardly so enthralled with the idea. Only five days later it reported unfavorably on the bill and turned its

8. Ibid.
9. Ibid., pp. 91-92.
critical attention to every aspect of the proposal, deeming a survey an extravagance. Surely, reasoned committee members, the state should not pay for basic research when "the simple arrangement and classification of rocks and soils is a work, which . . . can well be performed by the amateur students and professors of our colleges. ". . ." 12 And, the committee's report continued, even the application of such knowledge did not require such an expenditure. "We regard experience as the great teacher," the report said, "and the only sure guide in agriculture, and the best apparatus for testing the adaptation of the soils of the several counties. . . ." 13 Then the report concluded in a devastating classic of 19th-century metaphor:

In conclusion, we may be permitted to remark that, though we are disciples of progress, and are willing and eager to learn, we deem it advisable, for the permanent growth and future prosperity of our State, that we "hasten slowly," lest, peradventure, we should make "more haste than speed," and that, in view of the limited population and tax-payers' ability of the State, instead of running the car of progress, "high pressure" system, we should decidedly incline to favor the narrow gauge, single track, low pressure style, with Prudence ever on the lookout—Economy, master and conductor of the train—Caution standing ready to "put down the brake," and all hands on the watch to prevent dead heads from stealing a ride at the expense of the honest stockholders. 9

Somehow the bill survived that diatribe, thrown back on track by a crowded cast of characters and a series of coincidential events.

ONE FIGURE in the ensuing fracas over the bill was Watson Foster. Born in Vermont, Foster moved to Kansas via Indiana and Illinois, settling first in Lyon county, then in 1862 moving to Douglas county where he was elected to the state legislature. 10 In 1864 Foster moved to Leavenworth and began lecturing on science at Leavenworth College. In addition to college lecturing, Foster seemed constantly to be publicly pontificating on scientific subjects—at one point the Emporia News complained about "that superlative humbug and gas bag, Professor (of what?) Foster. . . . We were surprised that he was not delivering that 'lecture' on chemistry, which he learned when he was a boy." 16 Foster's scientific interest clearly included geology. He sat on the legislative committee that considered the 1863 survey proposal, and in a letter to Governor Carnes, Foster claimed to have written the 1864 version of the bill creating the survey. 17 It may have been Foster’s influence that led Leavenworth's Representative Laing to introduce the bill, and he may have had a hand in the Leavenworth Daily Conservative's outspoken support of the survey, although Leavenworth was a mining town at the time—large amounts of coal were being taken from underground mines—and that may have influenced Laing and the Conservative more than Foster.

The second personality appeared suddenly and at a propitious moment. Benjamin F. Mudge was a native of Maine who studied classics and science at Wesleyan University in Connecticut and worked briefly as a chemist before teaching public schools in Kansas City. The day after the house committee reported unfavorably on house bill 10, Mudge launched a series of lectures in Topeka on "Scientific and Economical Geology," and according to press accounts the speeches—made in house chambers during the evenings—were quite a success. "The lectures of Hon. B. F. Mudge," wrote the Topeka Tribune, "are exciting considerable interest, among the members of the Legislature, and the people of Topeka. He has spoken three times in the Representative Hall, to large audiences whose close attention attests how deeply they are interested in his lectures." 18 Mudge’s appearance at this point, and the crowds and interest he raised, undoubtedly did much to help along house bill 10.

And house bill 10 was still alive in spite of the unfavorable review by the agriculture committee. Through a bit of parliamentary maneuvering, the bill was reassigned to a special committee chaired by Representative Laing, the original sponsor of the measure. Only two days after the agriculture committee's blast at the bill, the special committee recommended approval 19 and on January 23, the house, "after some time spent therein,"

13. Ibid., pp. 92-93.
recommended that the bill be passed. Final approval came on a vote of 48 to 20, and senate passage followed, with a few minor amendments, on February 6, by a vote of 21 to two. Within a few more days the house agreed to the amendments, the governor signed the bill, and in less than a month after its introduction, the measure was approved and the survey authorized.

At that point, perhaps, the suspense should have ended. House bill 10, however, allowed the governor to appoint a state geologist and with the bill's passage the scramble for that plum began in earnest. There were two obvious candidates for the job. The first, Foster, had long made it plain that he wanted the position, but on February 2 he asked Carney to take his name out of consideration because opposition was building to his appointment. Although he had previously collected signatures of 21 house members in a petition supporting his candidacy, Foster said he was withdrawing because "some of your [Carney's] friends are making such a bitter fight against my appointment . . ." and by dropping out of consideration Foster felt he might "facilitate the passage of the bill through the Senate." Once the bill passed, however, Foster changed his mind and asked that Carney at least appoint him assistant state geologist and "give me the position of principal if you can without too much sacrifice." Evidently Foster's enemies and his earlier change of heart were enough to keep Carney from placing him in either post.

22. Foster to Carney, February 2, 1864, "Carney Correspondence Files."
23. Foster to Carney, February 22, 1864, ibid.
George C. Swallow (1817-1900), well known for his work as state geologist of Missouri, was the choice of some to be the first state geologist of Kansas. But charges implicating him in the border war between Kansas and Missouri put an end to his candidacy, and Mudge was appointed. In 1865 a second survey was approved by the legislature with Swallow as director—Mudge having resigned to teach at the Kansas State Agricultural College. Photograph reproduced from The Geological Survey Review, Lawrence, July, 1964.

The second obvious choice was George C. Swallow, well known for his work as state geologist of Missouri. Swallow had done extensive geologic work in eastern Kansas and held the proper academic credentials; at the beginning of the legislative session he was probably the betting favorite for the post and a resolution was even introduced in the house recommending Swallow for the position because he “possesses a knowledge of this part of the country that will enable him to make a better survey . . . . . for the same amount of money than any other man.” 24 But on January 19, 1864, the Leavenworth Daily Conservatice published a letter from one E.N.O. Clough that implicated Swallow in charges over the border war between Kansas and Missouri:

I desire to State that I understand he [Swallow] has been a prisoner for disloyalty since the commencement of this rebellion; and I know that in 1856, in Columbia, Brown County, Missouri, at which place both he and myself lived, he glorted in the name of border ruffian. [Swallow] is not such a man as we in Kansas desire to see placed in any position whatever, unless it be in a dependent one, when a good hemp rope would form the means of dependence. 25

These charges obviously concerned legislators throughout the session, and Foster refused to let them die. In his final letter to Carney, Foster added a postscript, “I have in my possession an affidavit showing beyond doubt that Swallow did voluntarily pay the expenses of one border ruffian in fifty-five to invade the state.” 26 Those charges, regardless of their substantiation, were enough to put an end to the Swallow candidacy.

With the decline of the two most obvious candidates, Swallow and Foster, there was no certain contender for the job. No contender, that is, except for the Kansas City school-teacher who happened to be in Topeka delivering his lecture series on geology. There is little record of Mudge’s reaction to those who mentioned his name as a candidate for state geologist; if he did any self-promotion it must have been relatively subtle. At any rate, by the time the bill creating the survey had passed both houses Mudge was clearly the consensus candidate to head the survey. One petition from members of the house of representatives listed 47 legislators in favor of Mudge’s appointment, and another treaty was signed by

21 members, although five other names on the list were crossed off with no explanation. At the bottom of that petition, also, is the following note, signed by Mudge: "This petition was started without my knowledge or consent. I am in favor of the appointment of Prof. W. Foster." 27

Regardless of Mudge's attitude toward the job, on February 29, 1864, Carney sent his nomination to the senate and it was approved. 28 With that the fight over creation of a survey and the appointment of its leader was ended. What were the results? First, the legislature had created a survey that was meant to be a practical endeavor to inform Kansans about the extent of their minerals and the condition of their soils. There was no mention of science for science's sake. Second, it created a huge task for the survey personnel. With $3,500, they were to survey a land area of over 82,000 square miles and report their results in less than 12 months. And third, partially because the survey was something of an experiment within Kansas government, and partially because of concern over the usefulness of the results, the legislature kept the survey on a short leash. The appropriation was small and had to be made annually. The head of the survey was subject to legislative approval. In short, the Kansas survey was not meant to be a permanent institution; it was to study the state's minerals and do it as quickly as possible.

For two years the survey labored at its assigned task. Results from the first year, under Mudge's leadership, were limited by a lack of time and by Indian uprisings that prevented the staff from visiting much of western Kansas. The legislature approved a second survey in 1865, this time under Swallow's leadership—Mudge having resigned to teach at the Kansas State Agricultural College. But funding lapsed after the second year, at which time many of the survey's responsibilities were assumed by the Board of Agriculture, and there was no separate, formal survey for the next 24 years. The next incarnation of the survey was not created until 1889 when it was placed under control of the Board of Regents and the University of Kansas, where it has remained since.

27. Members of the house of representatives to Carney, Mudge petition (n.d.), ibid.
Edmund Gasseau Choteau Guerrier (1840-1921), born in a Cheyenne Indian village in central Kansas, was the son of a French trader and a full-blooded Cheyenne woman. As a scout with the Hancock expedition in 1867 he allowed a band of Indians to escape from their village at Pawnee fork. Later with Custer, who was ordered to pursue the Indians, the half-breed scout mislead the troops, contributing to the failure of the expedition and the summer campaign that year against the hostiles. This pen and ink sketch of Guerrier and Custer by E. L. Reedstrom is reproduced courtesy of the author.