BUREAU OF ECONOMIC GEOLOGY

Geological Circular 65-5

Geology in the State Government of Texas

By

PETER T. FLAWN

The University of Texas

November 1965

BUREAU OF ECONOMIC GEOLOGY

Geological Circular 65-5

Geology in the State Government of Texas

By

PETER T. FLAWN

The University of Texas

November 1965

GEOLOGY IN THE STATE GOVERNMENT OF TEXAS[1]

Peter T. Flawn

Table I sums up the history of "geological survey" in Texas from its beginning in 1858, through its intermittent early history, to the present. It also shows that any organization which carried the name "survey" was very short-lived in Texas. Whether this is because of early legislators' convictions that a survey was something that was organized to do a specific job and then terminated, or whether there were deeper causes for the ephemeral nature of the early surveys is a matter for more thorough historical research and analysis.

TABLE I. TEXAS GEOLOGICAL SURVEYS

1.	The First or Shumard Survey	1859 - 1860
2.	The Second Survey	1873 - 1875
3.	The Third or Dumble Survey	1888 - 1892
4.	The University of Texas Mineral Survey	1901 - 1905
5.	Bureau of Economic Geology, The University of Texas	1909 -

The first Texas geological survey was a product of the 8th Legislature in 1858; the Act provided for a "geological and agricultural survey" of the State. It was sustained by annual appropriations and was independent of any other institution. B. F. Shumard was named State Geologist with G. G. Shumard as

---

1/ Text of an address delivered to the American Institute of Professional Geologists, Texas Section, San Antonio, Texas, September 17, 1965.

first assistant. In 1860, B. F. Shumard was suspended and Dr. Francis Moore, a journalist and publisher, was named State Geologist. A man named S. B. Buckley, who was on Shumard's staff as "Collector of Plants," was named to the first assistant's job. Later in 1860, Shumard was reinstated. These events indicate a political contest in the Legislature, with the Survey either a political football or the proverbial innocent bystander. The onset of the Civil War brought an end to the operations of the First Texas Survey. The Laboratories and Museum were occupied by a Percussion Cap factory. The records disappeared. Some have said that Buckley "went north" with the records.

Total cost of the Survey was less than $25,000; publications were few and consisted of a Report of Progress, a partial report on the geology of west Texas, and a preliminary report on geology and agriculture. However, had it not been for the war and political upheaval, the work laid out by Shumard probably would have been a credit to the State. He undertook to construct a series of geologic sections across parts of Texas and wrote 15 county reports. These reports included observation on minerals, flora, and agriculture.

In 1866, over Shumard's protests, Buckley returned to take charge, but in 1867 he was removed again--all remaining records disappeared in political upheaval.

In 1870, the State again attempted to develop some information on its natural resources, and a law very similar to the first Act was passed. However, it was not implemented until 1873, when the Second Survey--a geological survey--was established with J. W. Glenn as State Geologist and C. E. Hull as first assistant. Glenn resigned in 1874 because of "disorders and lack of appreciation of geologic work." He was succeeded by S. B. Buckley; Richard Burleson was first assistant.

There were two publications of dubious value by Buckley. The work was mostly reconnaissance. The Survey was terminated when the Governor vetoed the appropriation. Total cost was about $15,000.

The Third Texas Geological Survey--"a geological and mineralogical survey"--was created in 1888 by the 20th Legislature. It was not an independent institution but a part of the Commission of Agriculture, Insurance, Statistics, and History. Known as the Dumble Survey, with E. T. Dumble as State Geologist, it performed a really astonishing quantity of work and laid the foundation of Texas geology. It included such men as W. H. von Streeruwitz, W. F. Cummins, and R. A. F. Penrose; R. T. Hill of the U. S. Geological Survey worked in cooperation. Dumble divided the State into regions, each with a geologist. The Annual Report included reports on the general geology of the region, and some separate reports on mineral commodities were published--(e.g., coal and lignite). However, in spite of the fine record, the Survey was the subject of a fight in the 23rd Legislature, and in 1893 the Survey budget was vetoed by the Governor. Total cost of the Survey over five years was about $80,000.

Dumble stayed on in Austin finishing up reports, living off fees charged for services, hoping for a budget in 1895, but the Governor again vetoed the budget. In 1889, the Legislature transferred the library, records, and collections to The University of Texas.

However, there was a continuing pressure to find out something about the State lands. Charges were made that valuable mineral lands were being sold for practically nothing. So in 1901 the 27th Legislature created The University of Texas Mineral Survey (for a period of two years)--within the Board of Regents but not a part

of The University. It was attached to The University. William B. Phillips was appointed Director. The 28th Legislature extended the Survey for two years, but it was discontinued in 1905 after eight publications and maps on mineral districts, commodities, and problems of the mining laws of the State. The 29th Legislature failed to enact legislation to extend the Survey past August 31, 1905.

The University Mineral Survey included men of the caliber of J. A. Udden, B. F. Hill, Heinrich Ries, and G. B. Richardson. It differed from earlier attempts not only in being attached to The University but in having a more specific mission--to survey only lands belonging to public schools, The University, and asylums, and to determine mineral value of such lands. It also worked hard on the Texas exhibit for the St. Louis World's Fair. Total cost was about $25,000.

The Bureau of Economic Geology really grew out of The University Mineral Survey, as shown by the following statement from Minutes of the Board of Regents, Vol. C, pp. 463-464, June 7, 1909:

> "3. Bureau of Economic Geology. The Mineral Survey attached to the University was very useful to the people of the State and did much to convince them of the University's ability to give practical and useful scientific information. Its weakness was that it had to stand on its own feet instead of being a part of the University, and for a variety of reasons it proved incapable of sustaining itself before the Legislature. A further weakness was the insufficient specification of the services the Survey was prepared to render; this aroused expectations that could not be met, and led to disappointments and hostilities. I believe that a bureau of economic geology with carefully defined aims which it would be possible to encompass, would escape both these dangers and would in its usefulness justify its existence and bring support to the University."

Thus, the Bureau was established by the Board of Regents--as a special budget item. William B. Phillips was Director from 1909 to 1915. In 1911, the name was changed to Bureau of Economic Geology and Technology. A reorganization in 1915 established separate heads for a Division of Economic Geology, a Division of Engineering, and a Division of Chemistry. These Divisions became independent in 1925; all were together designated as the Division of Natural Resources, including (1) Bureau of Economic Geology, (2) Engineering Experiment Station, which became Bureau of Engineering Research in 1926, and (3) Industrial Chemistry Experiment Station, which became the Bureau of Industrial Chemistry in 1927. Later, these organized research Bureaus of the University together with the Bureau of Business Research were loosely grouped as the Texas Commercial and Industrial Research Council, which met quarterly to promote industrial development through joint public symposia.

The Bureau of Economic Geology has been distinguished by having on its staff geologists such as W. S. Adkins, C. L. Baker, J. W. Beede, Emil Böse, Wayne F. Bowman, H. P. Bybee, R. L. Cannon, Hedwig Kniker, J. T. Lonsdale, F. B. Plummer, Helen Jeanne Plummer, E. H. Sellards, H. B. Stenzel, E. B. Stiles, J. A. Udden, and others. Today the Bureau employs about twelve full-time geologists, a supporting professional staff, consisting of two chemists and a cartographer, with supporting cartographic technicians, and editorial and secretarial staff.

A quarter of a century after the Bureau of Economic Geology was organized as part of The University, in 1935, the Railroad Commission of Texas hired its first geologist; now it employs ten. The Texas Highway Department hired its first

geologist in 1948 and now employs eleven, but the title "geologist" was not used until 1951 or 1952. The old Texas Board of Water Engineers used federal geologists of the U. S. Geological Survey under a cooperative agreement which began in 1937. The first full-time geologist went to work for the Board in 1955. The Texas Water Commission[2] now employs nearly forty geologists in ground water and planning. The Board for Lease of University Lands was created in 1929 with Hal P. Bybee as geologist; the Board now employs four geologists. The General Land Office hired a geologist in 1951. The geologists in these various agencies are concerned with special resource problems--oil and gas and water--and with application of geology to engineering problems. The Highway Department's first geologist attempted to correlate pavement performance with the underlying geologic units. Thus, in Texas, geologic staffs were built by State agencies with special problems and responsibilities. In some other states, the State geological survey expanded to meet the new problems and performed the work through increased appropriations or on contract from the appropriate agency. Perhaps the most serious fault of the concept of building separate geological staffs within the several agencies is that these staffs are specialized and have a narrow view. They are not likely to be aware of the breadth, interrelationships, and complexities of conservation and resource problems throughout the State. This can be overcome by creation of a joint council or some other system to improve liaison between the separate agencies. In Texas, the Bureau of Economic Geology has been more a research agency and less a service agency than many

---

2/ Recently reorganized into the Texas Water Rights Commission and Texas Water Development Board.

State Surveys, although it performs both functions. It has on many occasions served as a consultant to geological staffs in the other State agencies in Texas.

State geological surveys, in Texas and elsewhere, separately or as parts of broader natural science surveys, were the first attempts at organized scientific research by State governments and in many remain to this day as their only attempts. Their job in general was to inventory the land resources of the young political unit--not just hard mineral resources, although those were recognized as the key to quick wealth--a bank account that could be drawn upon--but also arable land and water resources. In a few words, their mission was to discover and evaluate mineral resources on a reconnaissance scale and to develop new knowledge on the composition, structure, and geologic history of that part of the earth's crust called Texas or Illinois or Utah. The scientific knowledge, it was hoped, would lead to new discoveries and provide a basis for classification of lands as "agricultural" or "mineral."

We are now in a period of profound change.

This change involves a change from reconnaissance to detail, from small scale to large scale, but, most significant, from inventory to management. The State geological survey still performs the original function but with a change in emphasis. It is concerned with a much broader spectrum of earth resources including water, sand and gravel, and other nonmetallic minerals. Through more detailed mapping and stratigraphic studies, the State survey builds on the earlier geologic work to continually refine and enlarge geologic models and concepts. It has an expanded three-dimensional capability through the thousands of feet of boreholes drilled since the early days. It works to ferret out concealed mineral deposits and to evaluate marginal or potential resources.

Its newest function, however, is quite different and has to do with land use and planning.

Consider the new conservation ethic which is abroad in the land. Whereas conservation was before World War II largely concerned with prevention of waste, it has now sprouted two healthy new branches which we can call cleanliness and beauty. In the Department of the Interior's Conservation Yearbook for 1964, conservation is defined as "applied ecology." In a recent issue of the Professional Geologist, the editor commented on a statement by the Secretary of the Interior to the effect that "our resource problems in the 1960's are measured by the flyway of a bird, the length of a river, the half-life of an element, the path of a wind, the scope of the oceans, and the shape of our cities." The editor asked what happened to the ton, barrel, yard, and million-cubic-feet as units of resource measurement? And well he might ask. More and more militant but uninformed conservation groups have come to regard the extractive mineral industries as despoilers of the land. What does all this mean to the geologist who in large part, professionally speaking, is associated with the extractive industries, but who is also employed in ever-increasing numbers by State agencies concerned with environmental, conservation, and resource problems? It means great opportunity. At the same time, it means change.

The geologist's contribution cannot stop with mineral resources. Who knows more about the earth that we live on and in than the geologist? He knows, or should know, earth processes and he knows, or should know, how the character and geometry of earth materials relate to engineering systems. Thus, in any land use study, the geologist can make a contribution. For example, in a recent journal there was an article entitled "A new science--mined land reclamation."

Reclamation laws recently enacted or pending in many states clearly will result in a great enlargement of reclamation activities. The geologist who contributed to the extraction of minerals can also contribute to restoration of the land. In addition to providing basic data on the earth and its resources to planning and decision-making bodies, the geologist should take a leading role in planning. There are specialists who know more about certain phases of land use--soil scientists, soils engineers, hydrologists, limnologists, coastal engineers, and mining engineers. But they should not instruct the geologist in understanding of the earth. He should call them on special problems--they should not call him.

Planning, of course, is resented by many people. Planning is an empty exercise without authority to implement the plans. In the realization of plans, individual rights are submerged, particularly in land condemnations through exercise of eminent domain. Planning is regarded as bad by some because it is used extensively in socialistic and communistic political systems. It is, however, being forced upon our society by the burgeoning population. The alternative to planning is chaos. It is that simple. Therefore, there will be planning. Unless the State shirks its responsibilities, a great deal of it will be on the State level. The quarrel should be with uninformed planning, not with planning per se. Any planning concerned with land use--State government, regional, or city--should include geological counsel. Within the State geological survey there exists a pool of manpower and a large body of data on the geology of the State available to any groups informed enough to seek the information. They must only know enough to realize that they need it!

Conservation laws perhaps present the most serious infringement on private property rights in the United States, but the alternative to conservation laws is

waste, pollution, and ugliness. Among the earliest conservationists were distinguished geologists--John Wesley Powell, John Muir, C. R. Van Hise, and C. K. Leith. Where today are geologists identified with the conservation movement? Perhaps their greatest latter-day contribution has been in the oil-producing states where they work, with petroleum engineers, to make State conservation laws function and to more efficiently produce reservoirs through unitization. Such conservation efforts are largely unrecognized by other conservation-minded groups.

The geologist should become active and vocal in the conservation movement in its new strength and direction. Well-meaning and politically powerful conservation groups are growing all over the country. Someone needs to inform these people that the mineral industry--producing minerals for materials, fuels, and nutrients--is part of the price of an industrial society with a high standard of living. In an industrial society, man does not live in harmony with his environment--he consumes it and changes it. The mission of the conservationist is to minimize these changes, not prevent them. The only way to prevent them is to return to an agricultural or pastoral culture. If a choice between an agricultural and pastoral society and an industrial society is ever put to a vote, the electorate should understand that a return to a pastoral scene will require elimination of a large part of the population. Only in an industrial society can large populations be supported at a high level. The geologist's position of responsibility in the field of conservation, land use, and planning will come as he proves that he has the knowledge and the background on which sound governmental decisions must be based. He should challenge geological work done by less qualified engineers and scientists. Other State

government agencies must come to know that when they make decisions involving resources and conservation without consulting the State geological survey--and in Texas this means the Bureau of Economic Geology--they run the risk of making an uninformed decision. The profession and the public interest are at stake.

References

Deussen, Alexander (1936) Thirty-five years of progress in the knowledge of the geology of Texas: Univ. Texas Bull. 3501, pp. 37-57.

Hill, R. T. (1887) Present condition of knowledge of the geology of Texas: U. S. Geol. Survey Bull. 45, 95 pp.

Merrill, G. P. (1920) Contributions to a history of American State Geological and Natural History Surveys: Smithsonian Institution Bull. 109, pp. 471-496.

Schoch, E. P. (1936) A history of the Division of Natural Resources: Univ. Texas Bull. 3501, pp. 11-19.