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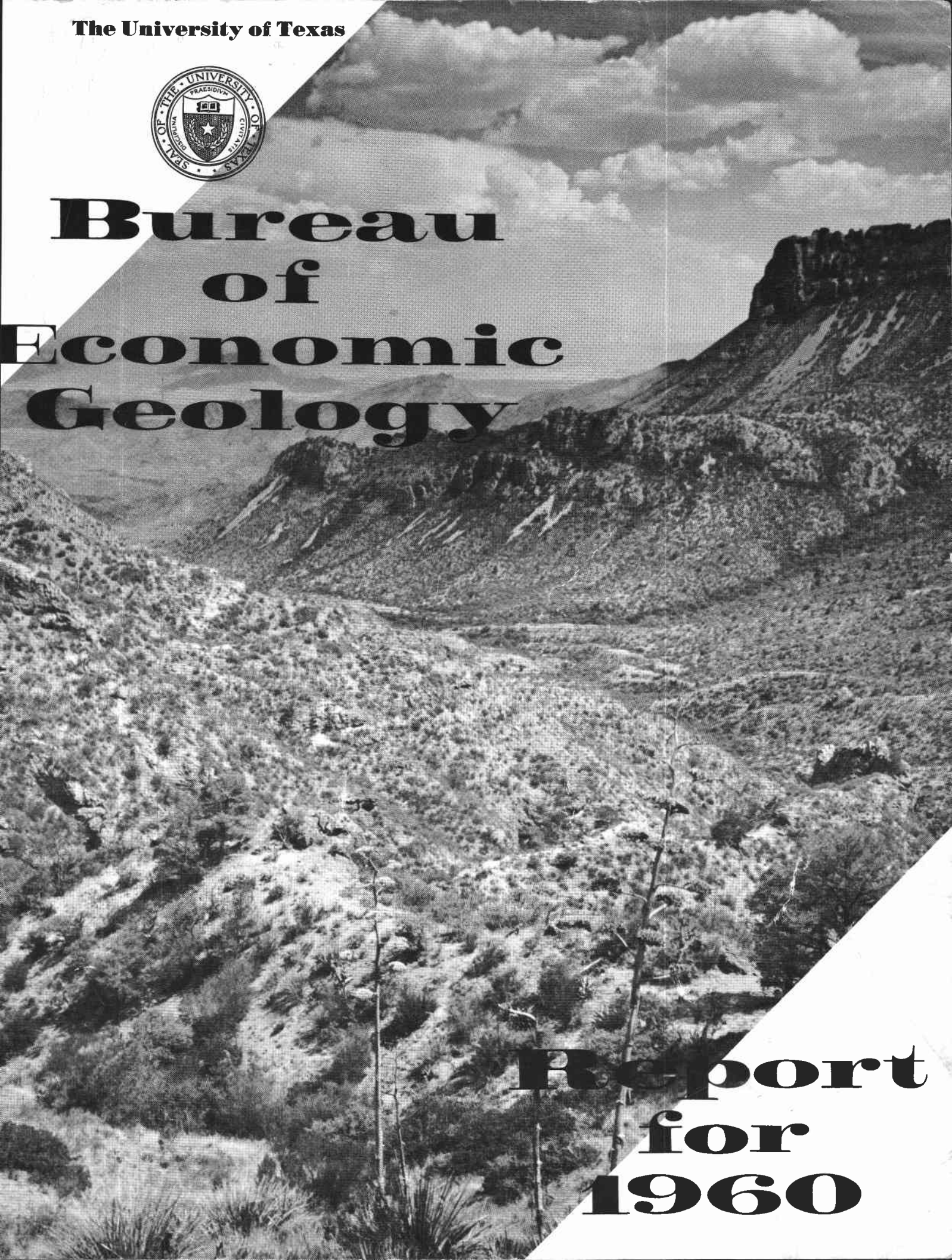


Bureau of Economic Geology

Report for 1960

John Tipton Lonsdale
1895-1960

Dr. John T. Lonsdale, Director of the Bureau of Economic Geology since 1945, passed away suddenly at his home on October 5, 1960. Dr. Lonsdale had a profound influence on geologic research in Texas and was noted for his work on igneous rocks in west Texas. The geological fraternity of the State and the mineral industry of Texas will miss him as a scientist, a citizen, and a friend.

Cover photograph. Big Bend National Park, southeast side of Chisos Mountains looking down Juniper Canyon toward Mexico. Photograph by W. Ray Scott. Courtesy of National Park Concessions, Inc.

WITH THE CLOSE of 1960, the Bureau of Economic Geology of The University of Texas completed its 52nd year of research and public service in geology. As a research unit of the University, the Bureau carries out the functions of a State Geological Survey and its Director fills the position of State Geologist.

The Bureau is engaged in both basic and applied geologic research and acts as a public information agency on mineral facts and problems in Texas. It also compiles and publishes geologic maps with or without accompanying text, carries on studies in all fields of geology, particularly in economic geology, stratigraphy, and structural geology, and supports graduate instruction in geology at The University of Texas. The Mineral Technology Laboratory of the Bureau is a departmental analytical and testing laboratory concerned with commercial applications of Texas raw materials. The Well Sample Library maintains a collection of well samples and cores from all over the State which are accessible for study at the Library.

Although Texas' annual mineral production has a gross value of more than 4 billion dollars, the Bureau of Economic Geology is small compared to similar organizations in many other states (Table 1). Publications of the Bureau cover all aspects of Texas geology; a list of reports and maps is available free on request.

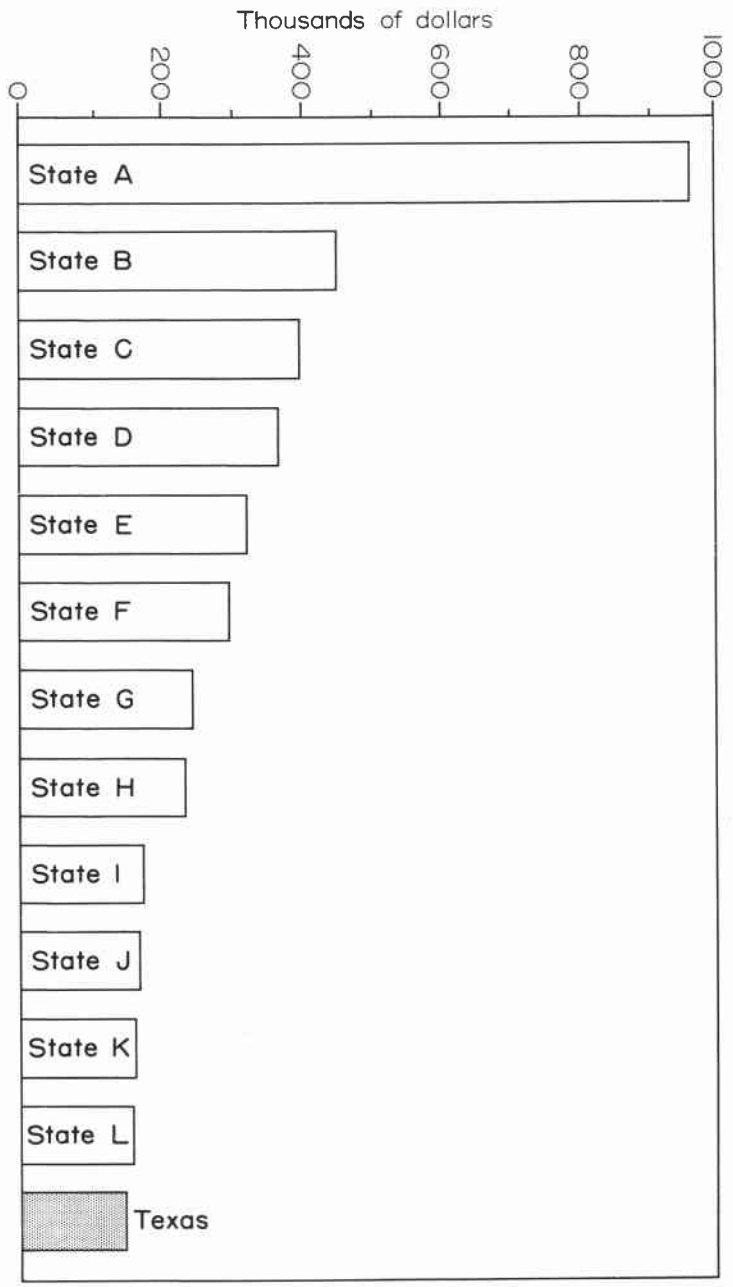


Table 1. **Appropriated funds for public service mineral resource work, 1956. This is the last year for which figures are available, and there has been little relative change since that date. (From Association of American State Geologists.)**

Publications in 1960

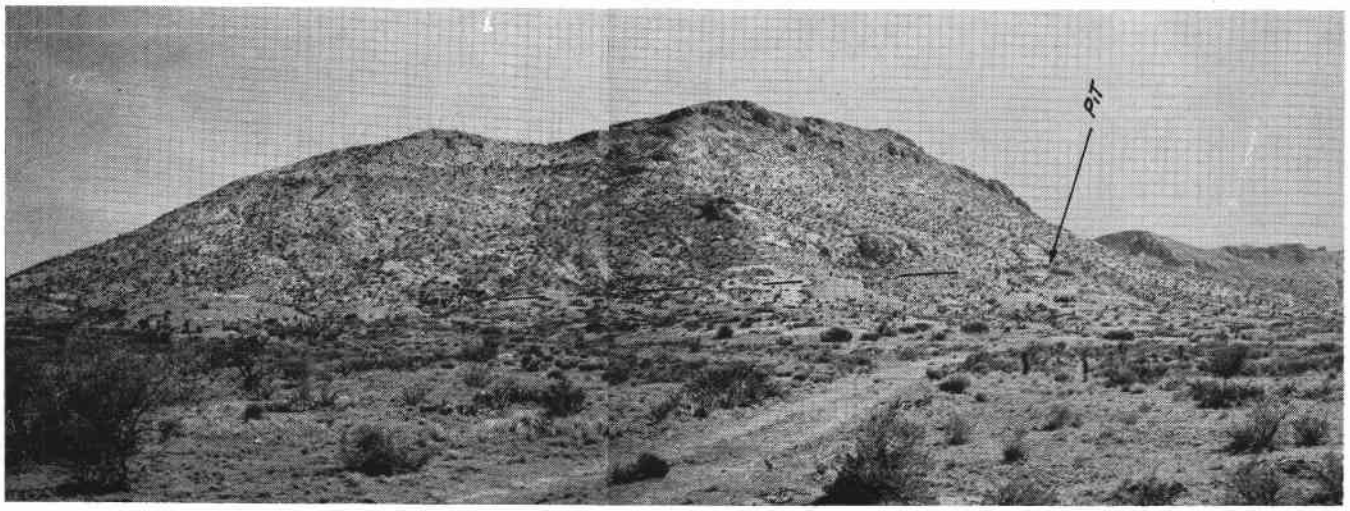
During 1960, the Bureau of Economic Geology published scientific papers in *The University of Texas Publication* series and in *Bureau of Economic Geology Report of Investigations* series as well as a popular guidebook on Texas fossils slanted toward amateur collectors, school teachers and students, and interested non-professionals.

In January, the Bureau issued The University of Texas Publication 5924, "Stratigraphy of the Pre-Simpson Paleozoic Subsurface Rocks of Texas and Southeast New Mexico," by Virgil E. Barnes, containing contributions by P. E. Cloud, Jr., and A. R. Palmer of the United States Geological Survey; E. J. Tynan of the Department of Geology, University of Oklahoma; and R. L. Folk and E. C. Jonas of the Department of Geology, The University of Texas. This monumental stratigraphic study, utilizing all modern techniques, was supported by grants from The Atlantic Refining Company, Gulf Oil Corporation, Humble Oil & Refining Company, Shell Oil Company, Sun Oil Company, and Texaco Inc. The pre-Simpson rocks of Texas include some of the most important oil and gas reservoirs in the State. Volume I (319 pages) includes a general discussion, individual reports, text figures and plates, and index; Volume II (542 pages) includes supplementary well data, sample descriptions, and analytical data. A separate holder contains numerous maps and charts.

Also within The University of Texas Publication series, Publication 6005, entitled "Graptolite Faunas of the Marathon Region, West Texas," by W. B. N. Berry, was issued in the spring. This important paleontologic and stratigraphic study will be a basic tool for Paleozoic stratigraphers and paleontologists and all geologists concerned with the stratigraphy and historical geology of Texas. The publication consists of 179 pages and is well illustrated with numerous plates.

In the fall, The University of Texas Publication 6017, "Aspects of the Geology of Texas: A Symposium," was issued. This publication contains six papers by nine authors; the papers were originally presented at a Conference on the Geology of Texas held as part of the 75th Year Celebration of The University of Texas. The papers deal with such topics as "Pennsylvanian Reef Patterns in West-Central Texas" (by Frank B. Conselman); "A Review of Paleomagnetic Studies of Some Texas Rocks" (by Joseph D. Martinez, Edwin H. Statham, and Lynn G. Howell); "Deposition and Alteration of the Edwards Limestone" (by Henry F. Nelson); "Geology of the Texas Panhandle" (by John H. Nicholson); "Conjectured Middle Paleozoic History of Central and West Texas" (by James Lee Wilson and O. P. Majewske); and "Paleozoic History of the Fort Stockton–Del Rio Region, West Texas" (by Addison Young). The publication contains 117 pages together with numerous figures and plates.

Report of Investigations No. 41, entitled "Stratig-



Continental Minerals barite properties in the Seven Heart Gap area of Culberson County

raphy of the Blach Ranch-Crystal Falls Section (Upper Pennsylvanian), North Stephens County, Texas," by L. F. Brown, Jr., was issued in the spring. This basic stratigraphic study with accompanying geologic map in color is one of several publications that will result from Dr. Brown's studies of Pennsylvanian rocks in north-central Texas. This report was used in connection with a field excursion sponsored by the Permian Basin Section of the Society of Economic Paleontologists and Mineralogists. It will be particularly useful to exploration geologists in the Wichita Falls and Abilene areas.

Late in the year, the Bureau issued Guidebook No. 2—the first of a new series of popular publications. "Texas Fossils, An Amateur Collector's Handbook," by William H. Matthews III, is a beautifully illustrated guidebook for fossil collectors, teachers, and students. Highly technical vocabulary has been avoided. There are 123 pages, 26 text figures, and 49 plates, including a small scale geologic map of Texas in color.

At the close of 1960 the Bureau issued Mineral Resource Circular No. 41, "The Mineral Industry of Texas in 1959," by F. F. Netzeband and Roselle M. Girard. This is a yearly statistical summary of the mineral industry of Texas published in cooperation with the United States Bureau of Mines and is a preprint from that Bureau's "Minerals Yearbook." Early distribution of this information is important to many State agencies in Texas.

Projects in Progress During 1960

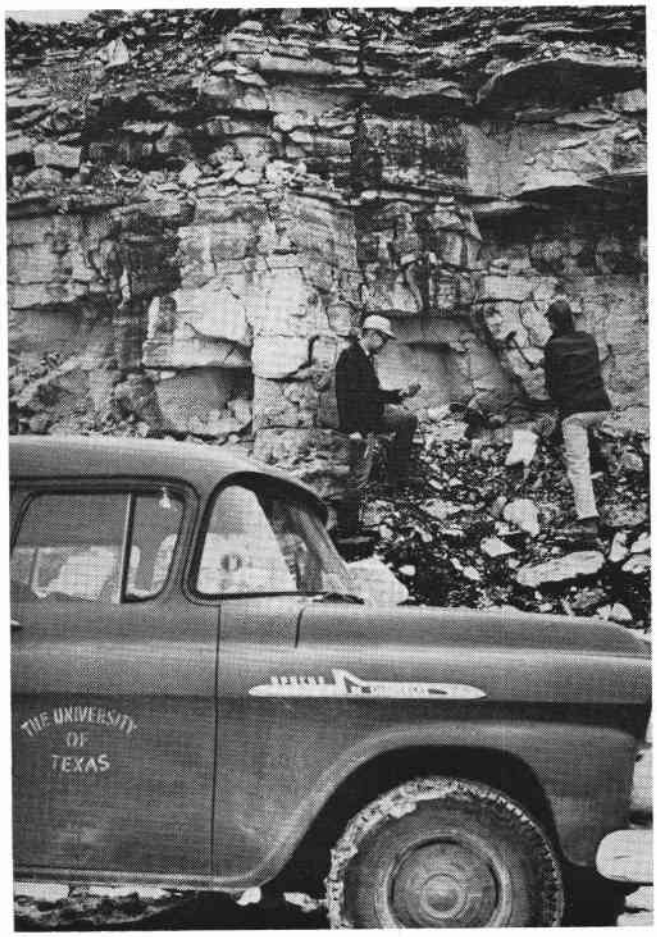
New projects initiated in 1960 include: (1) A mineral resource study of thirty-six south Texas counties. This project was made possible by a grant from the Corpus Christi Chamber of Commerce of $5,250.00 together with special testing equipment. Under the direction of Ross A. Maxwell, the study is scheduled for completion in 1961.

(2) A study of occurrence of high-calcium limestone and silica sand along the outcrop of Comanchean rocks from the Red River to the Rio Grande. This project, under the direction of Peter U. Rodda, involves extensive sampling and analysis and is scheduled for completion in 1962.

(3) Mapping and correlation of volcanic rocks northwestward from the Big Bend National Park into the Bofecillos Mountains of southern Presidio County. This important basic stratigraphic study will make it possible to correlate strata in mountain ranges separated by wide bolsons and will aid in solving some vexing problems in the complex area bordering the Rio Grande. John W. Dietrich is in charge of this work.

(4) Preparation of manuscript on "Some Texas Rocks and Minerals," the third in the popular guidebook series, was begun by Roselle M. Girard during 1960 and is scheduled for publication in 1962.

Among the continuing long-term projects, two major studies neared completion during 1960. Manuscript for the Ouachita structural belt project, by Peter T. Flawn, August Goldstein, Jr., Philip B. King, and Charles E.



Peter U. Rodda and assistant preparing to sample an exposure of Edwards limestone in Williamson County as part of the high-purity limestone project.

Weaver, was completed late in December, and the report is scheduled for publication in 1961. This is a comprehensive study of a major subsurface structural feature extending through the State from northeast Texas to Trans-Pecos Texas. The five-year project included detailed petrographic studies of samples from all of the wells which penetrated the belt. The main purpose of the project was to distinguish the major geologic elements within the belt and to evaluate the oil and gas potential of its frontal structures. Industry cooperation in this study was extensive.

The project on the geology of the Big Bend National Park, which has been in progress for a number of years, received a serious set-back with the death of John T. Lonsdale, one of the principal authors. Ross A. Maxwell, the senior author, together with John A. Wilson and Roy T. Hazzard, will attempt to complete the manuscript during the coming year.

Other continuing projects include the following:

(1) A study of rocks of the Cambrian system in central Texas, by Virgil E. Barnes and W. Charles Bell, Department of Geology, The University of Texas.

(2) A study of possible commercial sand deposits in central Texas, by Virgil E. Barnes and Daniel A. Schofield.

(3) A study of the stratigraphy of the Washita group in Grayson County, by Peter U. Rodda.

(4) The annual compilation of Texas mineral production statistics, by Roselle M. Girard. This important and continuing Bureau service is done in cooperation with the United States Bureau of Mines.

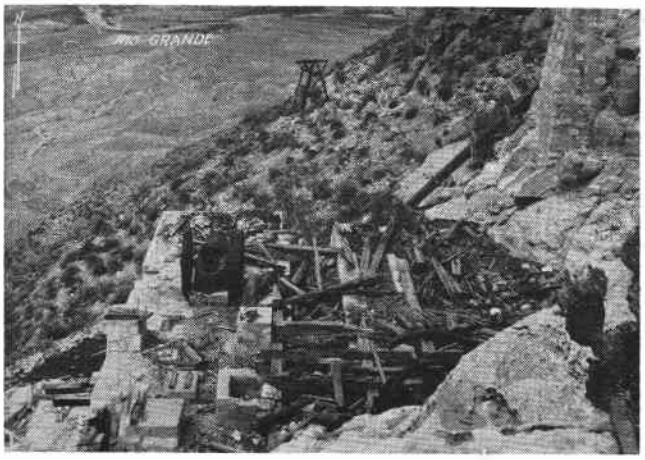
(5) Geologic mapping of the Ocotillo, Presidio, and Ochoa quadrangles in Presidio County, by John W. Dietrich.

(6) Description of Texas gemstones, by Elbert A. King, Jr., graduate student in geology at The University of Texas. This popular-style publication will appear in 1961 as Report of Investigations No. 42.

(7) Geology of the Eagle Mountains in Trans-Pecos Texas, by James R. Underwood, Jr., graduate student in geology at The University of Texas.

(8) Beneficiation studies of possible commercial silica sands in Texas, by Daniel A. Schofield.

(9) A study of Pleistocene terraces in the High Plains, by John C. Frye, Illinois Geological Survey, and A. Byron Leonard, Department of Zoology, University of Kansas.



Looking at the Rio Grande from the ruins of an old cable ore-transfer station on the Mexican side near Boquillas.

The Bureau also publishes high-quality manuscripts by geologists not on the Bureau staff and not receiving Bureau support of their research. Among manuscripts awaiting processing are the following:

"Annotated Bibliography of Conodonts and Index," by Samuel P. Ellison, Jr.

"A Stratigraphic Datum, Cisco Group (Upper Pennsylvanian), Brazos and Trinity Valleys, North-Central Texas," by Leonard F. Brown, Jr.

"Geology of Eastern Half of Kent Quadrangle, Culberson, Reeves, and Jeff Davis Counties, Texas," by John P. Brand and Ronald K. DeFord.

"Upper Cretaceous Ammonites From the Gulf Coast of the United States," by Keith P. Young.

Staff News

Dr. Peter T. Flawn, a member of the Bureau staff since 1949, has been appointed Director of the Bureau of Economic Geology.

Dr. Virgil E. Barnes is on leave-of-absence from September 1, 1960 to August 31, 1961. Under auspices of the National Science Foundation, he has been traveling abroad in connection with research on tektites. His studies have taken him to England, Denmark, France, Russia, Czechoslovakia, Germany, Italy, Egypt, Saudi Arabia, India, Singapore, Australia, Tasmania, Indonesia, Thailand, Viet-Nam, and the Philippines. He will return to Austin about March 1 and will continue working on other aspects of the project.

Dr. Leonard F. Brown, Jr., resigned from the Bureau

on September 1 to join the faculty of Baylor University. In April 1960 he was leader for a field excursion in the Abilene area sponsored by the Permian Basin Section of the Society of Economic Paleontologists and Mineralogists, and in October he repeated the trip at the Abilene meeting of the Southwestern Federation of Geological Societies.

Dr. Brown was replaced by Mr. William L. Fisher, who will receive the Ph.D. degree in geology from the University of Kansas during the coming year. Mr. Fisher is a stratigrapher and will undertake regional studies of Tertiary rocks in the Texas Gulf Coastal Plain. These studies will develop a stratigraphic background for more detailed studies of mineral deposits.

Dr. Peter U. Rodda addressed the Baylor Geological Society during the fall and led a field trip in the Palestine-Crockett area of the Coastal Plain. He also participated in a field trip in the Bosque County area. Also during the fall he and Mr. Fisher attended the meeting of the Gulf Coast Association of Geological Societies in Biloxi, Mississippi.

Dr. Ross A. Maxwell attended the 1960 field trip of the Corpus Christi Geological Society to the Eagle Pass–Del Rio area. He was active in public service work during the year. As the Bureau representative to the Board of Science Education of the Texas Academy of Science, he conferred with other Board members on science teaching in Texas schools. He also conferred with teachers in the Austin Public Schools on general science and geology of the Austin area. Dr. Maxwell lectured to science classes and continued active in the nature science activities of the Boy Scouts. He was honored by his selection as Chairman-elect for 1961 for the General Board of the Central Christian Church in Austin.

Mr. James W. Macon, Bureau cartographer, lectured to geology students at The University of Texas and at Baylor University, giving demonstrations on photogrammetry, photogeology, and map making.

Bureau scientists attending national scientific meetings included Drs. Virgil E. Barnes and Peter T. Flawn who attended the meetings of the American Association of Petroleum Geologists in Atlantic City in April 1960. Dr. Flawn was Business Representative for the Austin district from 1958 to 1960 as well as a member of the Research Committee and Chairman of the Basement Rock Project Committee. He also attended in November the meeting in Denver of The Geological Society of America.

Butane-fired quicksilver retort operating at the Armstrong Minerals, Inc., property on the Dobie Walls structure in Brewster County.

Texas Mineral Industry News

The most significant developments in the mineral industry of Texas (excluding the oil and gas industry) were connected with uranium, iron, barite, potash, sulfur, talc, water, and cement.

Susquehanna-Western, Inc., began construction of a 220-tpd mill to process uranium ores in the area of Falls City, Texas. This mill provides the first market for the uranium ores developed in Karnes and Atascosa counties during 1955 and 1956 and should encourage additional prospecting in the area. The $2 million installation will utilize acid leach and solvent extraction and provide Texas with a new mineral industry.

In east Texas, two companies are planning to use a direct reduction process—the Strategic-Udy process—to make steel from low-grade Texas ores. Both Sovereign Steel (Palestine) and Lone Star Steel (Daingerfield) will enter into direct reduction of iron ores. Also of interest in connection with the east Texas iron de-

Tumbledown Mountain, Culberson County, looking north toward the talc workings at the base of the massive overthrust plate of Allamoore formation.

posits is a report by the United States Bureau of Mines (Report of Investigations No. 5647) on beneficiation of the low-grade iron ores in that region.

Barite made news in widely separated areas of the State. Near Van Horn in Culberson County, Continental Minerals of Fort Worth carried on exploration and development work on their Seven Heart Gap properties and began construction of a mill on the Texas & Pacific Railroad about 6 miles east of Van Horn. The mill is scheduled to begin operation about January 31, 1961. About 600 miles to the east, in the Houston area, International Minerals and Chemical Corporation constructed a highly automated plant to process both domestic and foreign barite ores.

The occurrence of potassium salts in Texas was discovered by Dr. Johan A. Udden, Director of the Bureau of Economic Geology from 1915 to 1932. In 1912, Dr. Udden found substantial quantities of potash in brines from a well in Dickens County. Exploration for commercial quantities of potash in Texas was carried on until 1932, partly by a joint program of the Bureau of Economic Geology and the United States Geological Survey, partly by the U. S. Geological Survey and U. S. Bureau of Mines, and partly by private interests. The result was the location of a giant and prosperous potash mining and processing industry near Carlsbad, in New Mexico north of the Texas border. During 1960, however, there was a resurgence of potash exploration in Texas, and at the end of the year drilling was in progress in Loving County. Discoveries of commercial deposits of potash in Texas could lead to the establishment of a major mining industry in the State.

Developments in the sulfur mining industry during 1960 included installation of a new mining and manufacturing operation by U. S. Sulphur Corporation at High Island dome east of Galveston.

Late in 1959 the Pioneer Talc Company completed their mill at Allamoore, Texas. This is the first processing unit to be constructed in the growing Hudspeth County talc district. Production from active properties in this district totaled about 60,000 tons in 1960.

Late in the summer, construction was started on a 1-million gallon per day saline water conversion plant at Freeport. This is the first of five such plants authorized by the Federal government. Also during 1960, Universal Atlas Cement Division of U.S. Steel Corporation at Waco, Texas, began a multimillion-dollar expansion program designed to double present capacity.

Edwards limestone in the Texas Crushed Stone Company's quarry, Georgetown, Texas.

J. E. Elliot Collection Comes To Bureau

Mr. John E. (Brick) Elliot of Austin, retired geologist and manufacturer, has generously presented to the Bureau an extensive collection of geological data covering the area of Bastrop, Lee, Caldwell, Gonzales, and Fayette counties. The material includes well logs, aerial photographs, and geologic maps and constitutes important basic research data for the south-central Texas area. As soon as the material is indexed, it will be placed on open-file at the Bureau administrative offices.

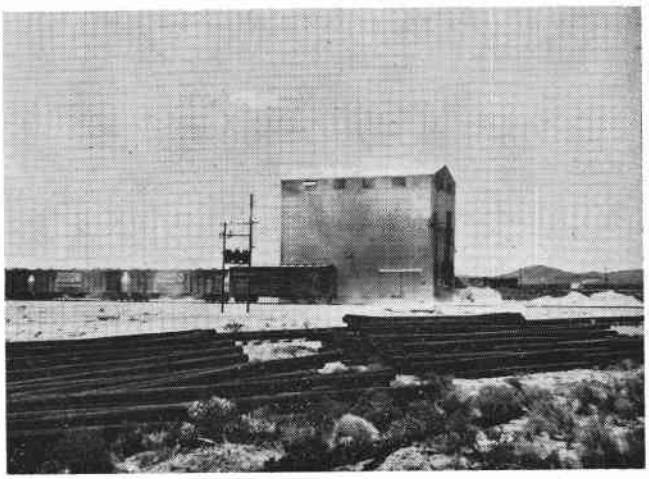
Well Sample Library

Construction of new low-cost storage units to house the Bureau's well core collection continued during 1960, with the addition of three new units. At the present time nearly all of the cores in the collection have been moved into the new cell units and are easily accessible for study.

The most important additions to the Well Sample Library collections during 1960 include (1) samples from a number of shallow closely spaced test borings in the area of uranium mineralization in Karnes County (donated to the Bureau by the Climax Molybdenum Division of American Metal Climax); (2) samples from Shell Oil Corporation No. 1 Carroll in DeWitt County to a total depth of 19,730 feet; and (3) samples from Ginther, Warren, and Ginther, Gulf Oil Corporation, and Michel T. Halbouty No. 1-A O. W. Killam in Webb County to a depth of 15,066 feet.

Mineral Technology Laboratory Gets Viscosimeter

As part of the Corpus Christi Chamber of Commerce grant to the Bureau of Economic Geology, the Mineral Technology Laboratory received an important piece of new equipment for testing of Texas clays. The viscosimeter will be used in evaluation of Texas bentonites for use in the manufacture of drilling fluids.



The new mill of the Pioneer Talc Company at Allamoore in Hudspeth County.

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