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ANNUAL ADMINISTRATIVE REPORT  
OF THE  
STATE GEOLOGIST  
OF  
ARKANSAS

DEC. 1, 1926—DEC. 1, 1927



ARKANSAS GEOLOGICAL COMMISSION  
3815 WEST ROOSEVELT ROAD  
LITTLE ROCK, ARKANSAS 72204

BY  
GEORGE C. BRANNER  
STATE GEOLOGIST  
LITTLE ROCK  
1928

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LETTER OF TRANSMITTAL

STATE OF ARKANSAS  
ARKANSAS GEOLOGICAL SURVEY  
GEORGE C BRANNER, STATE GEOLOGIST  
ROOMS 445-447 STATE CAPITOL  
LITTLE ROCK, ARK.

February 17, 1928

Hon. John E. Martineau,  
Governor, State of Arkansas,  
Little Rock, Arkansas.

Sir:—

In compliance with the law which requires the State Geologist to transmit an annual progress report to the Governor, I hand you herewith a statement of the work of the Office of State Geologist from December 1, 1926 to December 1, 1927.

I beg at the same time to thank you for the support and co-operation I have received at all times at your hands.

I have the honor to remain,

Yours very sincerely,  
GEORGE C. BRANNER,  
State Geologist.

## I.

### FOREWORD

During the period from December 1, 1926, to December 1, 1927, the Office of State Geologist has undertaken an extensive program of work. This has been made possible by the passage of Act No. 142 of the 46th General Assembly of Arkansas. This provides essentially for the creation in the State Treasury of a fund termed the "State Geologist Fund" provided for by an increase in the Severance Tax on minerals and amounting to an added .1% ad valorem on all minerals excepting manganese and coal. The added tax on manganese is one mill for each long ton of ore produced and coal is excepted from increased taxation. This Act passed the House with a vote of 77-6 and the Senate with a vote of 28-3 and was signed by the Governor on March 15, 1927.

Through the passage of this bill, the State Geological Survey has been enabled to undertake a more comprehensive program of geological, topographical and stream gaging work than has been undertaken by an Arkansas Geological Survey since 1892.

In three branches of work undertaken there has been active co-operation with federal and private agencies. In geological work the co-operative funds available during the fiscal year ending June 30, 1928, are approximately \$12,350; in the topographic work, approximately \$5,050; and in the water supply work, approximately \$840, or a total amount of \$18,200 or 49% of the estimated annual tax income for the support of the department during the fiscal year July 1, 1927, to June 30, 1928. Federal and private funds have thus increased the usefulness of this office about one-third. In allocating funds for geological and topographical work, the fact that approximately 90% of the mineral values of the State are now derived from oil, natural gas, and natural gas gasoline has been a factor which has been continually kept in mind as has also the fact that over 98% of the revenue of this department is derived from these sources. It is believed that a substantial portion of the funds available to this office should be expended for the purpose of stimulating the production of oil, gas, and natural gas gasoline when there is a reasonable assurance that useful work can be done.

## II.

## WORK UNDERTAKEN

The program of work undertaken by the State Geological Survey may be divided into the following classes:

- I. Geological
- II. Topographical
- III. Stream Gaging
- IV. Office Administration

## I. Geological Work

The geological surveys carried on during the year have been as follows:

1. **A Survey of the Oil and Gas Possibilities of the Lowland or Coastal Plain Area of Southern and Eastern Arkansas**—This important work is in charge of Mr. Wm. C. Spooner and an assistant, Mr. Garland O. Grigsby. Mr. Spooner has a wide knowledge of the oil and gas geology of the Coastal Plain of Arkansas and Louisiana. He is a graduate of the Polytechnic Institute of Brooklyn, N. Y., and is the author of many studies relative to the oil and gas geology of Louisiana. Mr. Grigsby is a graduate of the Geological Department of the Louisiana State University.

Mr. Spooner's work embraces a study of the surface and subsurface, structural and stratigraphic conditions in Southern and Eastern Arkansas. His report will include the publication of three subsurface maps and several sections which will show the depth at which the oil and gas producing horizons of Southern Arkansas can be found in many of the Coastal Plain counties. These include (1) a subsurface contour map on the top of the Nacatoch formation, (2) a similar map on the top of the Trinity formation, (3) a contour map on the top of the basement rocks underlying a portion of the Coastal Plain. The report will contain detailed descriptions of the stratigraphic and structural conditions, a detailed description of the paleontology of the subsurface beds, separate field studies including the Smackover, Irma, Stephens, and South El Dorado fields together with depletion data on these fields, and a fairly complete list of elevations in the lowland counties of the State. It is anticipated that this report will be a practical and useful contribution for the use of the prospector, geologist, and appraisal engineer, and it is hoped that it will stimulate more intelligent and economic prospecting in the portions of the Coastal Plain where there is a reasonable amount of information now available. The logs of approximately 700 wells were studied in making these maps and sections. Mr. Spooner has unquestionably collected much more information concerning the wells drilled and formations penetrated in Southern Arkansas than has

heretofore been accumulated. The report will be the first of its kind and will fulfill a long felt need.

**2. A Report on the Upper Cretaceous Formations of Southwestern Arkansas**—This work was originally planned as a co-operative project between the Federal and State Surveys. Lack of funds in 1925 made it impossible for the State Survey to carry out its part of the co-operative plan and the Federal Survey decided to carry it out as an independent project. The field work, completed in 1926, and the report are both the work of Carle H. Dane of the U. S. Geological Survey. After the passage of Act No. 142 of the 46th General Assembly it became apparent that funds would be available for this co-operative work and inasmuch as the publication of the report by the Federal Survey would probably have been delayed for two or more years, it was agreed that the publication and issue of this report would be made by the Arkansas Survey. This report is principally a detailed study of the surface outcrops of the Upper Cretaceous formations of Southwestern Arkansas including Little River, Sevier, Howard, Hempstead, Pike, Clark, and Nevada Counties. The principal economic value of this report lies in the fact that the formations which outcrop in this portion of the State are associated with the petroleum and natural gas accumulations of Southern Arkansas and a detailed study and classification of them will prove of immediate assistance to intelligent prospecting for oil and gas in the Southern and Eastern portions of the State. The study includes a detailed description of the physical and paleontological characteristics of these beds so that prospectors will be assisted in the identification of these formations when they are reached by the drill and will be more able to locate their position with reference to the more favorable producing horizons. The report will contain about 350 pages of text, areal geological maps, sections, etc., and will probably be ready for distribution in July, 1928.

**3. A Study of the Structural Conditions Favorable for Gas Accumulations in the Arkansas River Valley Region of Western Arkansas.**—This work has been undertaken by Mr. Carey G. Croneis, at present, instructor in the Department of Geology, Harvard University. Mr. Croneis has been assistant professor of geology in the University of Arkansas and has given much time and attention to the study of the geological formations of Western Arkansas and is the author of studies on the geological formations of Northern and Western Arkansas. Mr. Croneis has been assisted in his field work by Mr. Homer L. Anderson, Mr. Bryan Parks, and Mr. Cecil Robinson, all of whom are graduates of the Department of Geology, University of Arkansas. The object of this survey has been to work out the structural conditions in the Arkansas River Valley and from this information, to designate the structures which are favorable for the accumulation of natural gas. Approximately 250 townships or 9,000 square miles were covered in this survey which included an area from the Arkansas-Oklahoma line, east to the Coastal Plain or Lowland Area of Eastern Arkansas and from Township 3 North to Township 12 North,

inclusive. Either all or portions of the following counties were included: Crawford, Franklin, Sebastian, Logan, Scott, Yell, Perry, Johnson, Pope, Van Buren, Conway, Faulkner, Pulaski, Cleburne, White, and Lonoke. Over 85 anticlinal structures were mapped in the valley. It is anticipated that this report will be of value to the prospector for natural gas in this region. It is believed that there are considerable supplies of natural gas available in this area which have not yet been discovered which may be turned to industrial uses.

#### **4. A Study of the Zinc and Lead Area of Northern Arkansas—**

A co-operative arrangement has been made with the U. S. Geological Survey which will involve a detailed study of the geology of the zinc and lead areas of north Arkansas. Under this arrangement the Federal Survey has agreed to contribute \$5,000 and the Arkansas Geological Survey \$5,000 for the cost of the field work. The field work was started the first week in September, 1927, by Mr. E. T. McKnight of the U. S. Geological Survey and will probably continue until the fall of 1928. Mr. McKnight has been assisted in a portion of his field work by Mr. Cecil D. Robinson. The work will include a detailed survey of the areal and structural geology of the region insofar as they bear on the lead and zinc ore deposits. Detailed maps of the prospects, openings, shafts, and underground workings will be made. It is planned to make this report of immediate usefulness with the expectation that it will help to bring about economical development within the zinc and lead mining area. The report will cover portions of Boone, Marion, Newton, Searcy, Stone, Independence, Izard, Sharp, Lawrence, and Randolph Counties and will either be published by this Survey or that of the United States. Co-operative funds were made available for this project by the U. S. Geological Survey in response to a request made the Federal Survey by Senator T. H. Caraway.

#### **5. The Compilation and Publication of a Geological Map of Arkansas—**

It is apparent that there is considerable need for a detailed large scale geological map of Arkansas. The compilation of this map has been actively undertaken and on December 1, 1927, is nearly ready for publication. The scale adopted is about 8 miles to the inch which is the same as that employed on the geologic maps of Oklahoma, Missouri, and Tennessee, thus making the Arkansas map a unit with these. All of the geological maps of portions of the State have been examined and the dependable portions used. In addition to the detailed geology, this map will include the locations of oil and gas fields, mines and quarries, oil and gas pipe lines, power lines, and power dams.

During July and August, 1927, Dr. Albert W. Giles, Professor of Geology, University of Arkansas, assisted by Mr. Bryan Parks, graduate of the Geological Department of the University of Arkansas and Mr. Eugene Brewster, an undergraduate of that department, undertook the mapping of the St. Peter and Ruddell's sandstone formations in north Arkansas. The data obtained is to be used on the geological map of the State. The territory covered included portions

of Independence, Izard, Stone, Baxter, Fulton, and Sharp Counties. During the course of the work, approximately 950 miles of the outcrop of the St. Peter formation were mapped and 500 miles of the Ruddell's sandstone. This work fills a gap in the geology of north Arkansas. Dr. Giles plans to make a collection of sand samples from different portions of the St. Peter and Ruddell's sandstone formations later on for the purpose of determining the economic value of different portions of these two sandstones.

**6. A Publication, "Outlines of Arkansas' Mineral Resources" Was Issued During the First Part of 1927**—The publication of this booklet was made possible through the co-operation of the Commissioner of Mines, Manufactures and Agriculture, W. N. Wilkes. \$2,500 was contributed by Commissioner Wilkes and \$1,300 by this department. An edition of 5,000 copies has been printed. This book includes a discussion of the various minerals produced in the State, their locations, the quantity and quality of the ores produced, statistics concerning past production, market values, the names and addresses of producing firms, a bibliography of the various minerals, and maps and charts concerning the production of these minerals. This book has met a demand for organized information for which this office has had a continual demand during the past three years. Reprints of two sections of this booklet have been made in order to save distribution costs.

**7. A Base Map of Arkansas Showing the Location of All Oil and Gas Wells and Producing Fields is Being Prepared by This Department**—The map is being prepared on a co-operative basis with Commissioner Parker C. Ewan acting for the Department of Conservation. This map, which is about 7 feet by 8 feet in size, is made in two sections, northern and southern halves, and both the records of the Department of Conservation and Inspection and the Geological Survey as well as other data are being used to make the map as complete as possible. The wild-cat tests drilled since March 23, 1923, are shown with numbers which conform to the number of the permit for drilling issued and filed in the Department of Conservation and Inspection. These maps will be available to the public, either in part or whole, for the approximate cost of the printing.

## II. Topographical Work

Under the usual agreement made by the U. S. Geological Survey with State Geological Surveys, the Federal Survey agreed to pay one-half of the field costs for topographic mapping in Arkansas during the fiscal year, 1927-28. This offer was made to include any sum up to \$25,000. Under this arrangement, the State Survey entered into a contract to pay \$3,750 (later increased to \$5,050) for the surveying of the El Dorado quadrangle. This includes an area of approximately 250 square miles, the contour interval will be 20 feet and the scale, 1:62,500 or approximately one inch to the mile. This sheet should prove useful to the city of El Dorado in connection with



engineering projects, to the State Highway Department, and to some degree to geologists. There has been in the past a considerable demand for this sheet. The first lithographic copy will probably be ready during April, 1928. Under the co-operative arrangement made, the U. S. Geological Survey bears the entire cost of engraving and printing this quadrangle. The field personnel for this work was supplied by the U. S. Geological Survey, the work being under the direction of C. L. Sadler, District Topographic Engineer.

### III. Stream Gaging Work

Stream gaging work has been undertaken as a co-operative measure. The co-operative funds of the Water Resources Branch of the U. S. Geological Survey, however, were available only to the extent of \$500 at the time the request for them was made. In order to get the work started, the State Survey agreed to contribute \$2,500 for this purpose. Up to the present time, the Arkansas Power & Light Company has contributed \$300 toward stream gaging work. According to Mr. Elbert Smith, secretary of the Ozark Hydro-Electric Power Company, the plan of the Arkansas Power & Light Company is to contribute an additional \$2,600 for stream gaging work to be carried on in 1928. It's anticipated that during the next fiscal year co-operative arrangements with the Federal Survey will approach a dollar for dollar basis instead of the present five to one relation. Under the co-operative arrangement the installation of gaging stations, their reading and maintenance and the making of rating curves for each gaging station is in charge of Mr. H. C. Beckman, U. S. District Engineer, Rolla, Mo. He is assisted by Mr. V. L. Austin of the Water Resources Branch of the U. S. Geological Survey. The accompanying table shows the location of the stream gaging stations in Arkansas. The stations at Heber Springs, Rammel Dam, Hot Springs, Marked Tree, Clarendon, and Little Rock were installed and are maintained by other agencies than this Survey but the entire list represents those stations on which rating curves are now being prepared under the direction of Mr. Beckman and the records of which will be published by this Survey. The value of this work will depend upon the length of time the stations are maintained. It is planned that with perhaps one or two exceptions the stations now installed will be maintained permanently. The information that is gained from certain of these stations is necessary for the estimate of available water power and that obtained from other stations is necessary for determining run-off data for flood control measures.

The stations installed for the purpose of accumulating flood control data on the White River at Clarendon and Newport, on the St. Francis River at Marked Tree, at Big Lake Outlet at Manilla and on the Arkansas River at Van Buren were installed with the approval of the Arkansas Flood Control Association, Gen. John R. Fordyce, acting head.

**I. GAGING STATIONS FOR DETERMINATION OF AVAILABLE WATER POWER  
AS OF NOVEMBER 1, 1927**

River	Name of Station	Location	Type of Gage	When Installed	When Read	Cost of Installation	Cost of Gage Reading
Little Red River	Heber Springs	NE $\frac{1}{4}$ , Sec. 1, T. 10 N., R. 10 W.	Staff	Sept. 15, 1927	Daily	\$ 60.00	Furnished by Ark. Power and Light Co.
Ouachita River	Rommel Dam near Malvern	SW $\frac{1}{4}$ NW $\frac{1}{4}$ , Sec. 36 T. 3 S., R. 19 W.	Recording	Installed Jan. 28, 1925. Washed out April 1, 1927. Not yet replaced	Continuous	2200.00	Furnished by Ark. Power and Light Co.
Little Missouri River	Murfreesboro	SE $\frac{1}{4}$ , Sec. 13, T. 8 S., R. 26 W.	Chain	Jan. 15, 1928	Daily	40.00	\$5.00 per month.
Ouachita River	Hot Springs	SW $\frac{1}{4}$ , Sec. 29, T. 3 S., R. 19 W.	Chain	June 27, 1922	Daily	40.00	\$15.00 per month paid by Ark. Power and Light Co.
White North Fork	Cotter		Recording Staff	Not installed			To be furnished by Ozark Hydro-Electric Power Co.
Buffalo	Rush		Staff	To be installed if bridge built. Not installed			

**II. GAGING STATIONS FOR ACQUIRING FLOOD CONTROL DATA**

White River	Newport	On line between Sec's 16 and 17, T. 11 N., R. 3 W.	Chain	Sept. 18, 1927	Daily	40.00	Furnished by Mo. Pac. R. R.
St. Francis River	Marked Tree	SE $\frac{1}{4}$ , Sec. 10, T. 11 N., R. 6 E.	Staff	July 30, 1927	Daily	No cost to Ark. Geol. Survey	Furnished by Poinsett County Drainage Dist. No. 7
Big Lake Outlet	Manilla	SE $\frac{1}{4}$ , Sec. 9, T. 14 N., R. 9 E.	Chain	Sept. 22, 1927	Daily	40.00	Furnished by Mississippi County Drainage Dist. No. 17
White River	Clarendon	NW $\frac{1}{4}$ , Sec. 32, T. 1 N., R. 3 W.	Staff	Sept. 24, 1927	Daily	No cost to Ark. Geol. Survey	Furnished by U. S. Weather Bureau
Red River	Garland City	At SL-SW Ry. bridge at Garland City	Chain	Sept. 30, 1927	Daily	\$40.00. Installed by Ark. Geol. Survey	Furnished by SL SW Ry.

**III. GAGING STATIONS FOR THE DETERMINATION OF AVAILABLE WATER POWER AND ACQUIRING FLOOD CONTROL DATA**

Arkansas River	Little Rock	At Main Street bridge Little Rock	Staff	July 28, 1927	Daily	No cost to Ark. Geol. Survey. U. S. W. B.	Furnished by U. S. Weather Bureau
Arkansas River	Van Buren	At highway bridge at Van Buren	Chain	Oct. 4, 1927	Daily	\$40.00. Installed by Ark. Geol. Survey	\$5.00 per month

#### IV. Office Administration

In addition to handling the routine work of the office, during the past year the State Geologist has taken numerous field trips to different portions of the State for the purpose of keeping in touch with the field work in progress and examining mineral properties which have appeared to be worthy of immediate investigation. He completed the preparation of "Outlines of Arkansas' Mineral Resources" and the supervising of two reprints from that booklet. He has prepared articles for newspapers, scientific journals and bulletins relative to Arkansas geology and mineral production. He presented a paper at the 1927 meeting of the American Association of Petroleum Geologists on the "Oil and Gas Possibilities in the Arkansas River Valley" and also attended the meeting of the annual conference between the State Geologists and the Director of the U. S. Geological Survey in Washington, in April, 1927. He also attended the meeting of the American Manganese Producers Association at Washington, in August, 1927, for the purpose of keeping informed as to the manganese tariff situation important from the standpoint of the Arkansas industry.

The following services have been maintained as part of the routine work of this department:

1. **Requests for Information Answered**—During the past year, the Survey has handled approximately 1,500 requests for geological, mineralogical, and industrial information bearing on the mineral, soil and water power resources of the State, and has sent out approximately 2,000 publications, reports, and maps. Complete chemical analyses have been made of specimens submitted when believed advisable. An index is kept of the names of owners of mineral properties, who report the existence of certain mineral deposits and ask for a market outlet. Their names are submitted to those who inquire for the location of such mineral deposits, and also to buyers and manufacturers who may be interested in the purchase or development of southern mineral properties.

2. **Tax Reports**—This department has compiled the State Severance Tax quarterly reports and the monthly tax reports of sand and gravel removed from state-owned stream beds and the information contained in them is classified for reference. Quarterly statistics are now kept which give the name of the producer, the quantity and the value of each mineral product in the State since April 23, 1923. The items involved are classified under the following heads: Oil, Gas, Natural Gas Gasoline, Coal, Bauxite, Clay, Lime, Manganese, Sand, Stone, Gravel, Diamonds, Chalk, Zinc, and Lead.

3. **Other Statistics**—Other statistics relative to the mineral production of the State kept on file in this office are derived from the following sources: (1) U. S. Geological Survey, (2) American Petroleum Institute, (3) U. S. Department of Commerce, (4) U. S. Census Bureau, and (5) various trade publications.

4. **Well Log File**—A collection of miscellaneous well logs is maintained by the Survey. These are logs of wells which were drilled prior to the establishment of the State well log division of the Arkansas Railroad Commission on March 23, 1923, which division has now been transferred to the Department of Conservation and Inspection. This collection augments the log file of the State Department of Conservation and Inspection. There are now approximately 450 logs on file here.

5. **Geologic Library**—A geologic library containing over 600 books and pamphlets bearing on the minerals, soils and water power of Arkansas and other states is maintained for reference. This library is being continually increased by the addition of State, Federal and other reports as published.

6. **Bibliography of the Geology of Arkansas**—A subject and author index of all books, pamphlets, reports, etc., bearing on Arkansas geology is maintained. This index includes about 759 books and articles and is of assistance in locating reports and records which have been made of the different minerals and soils, water power, etc.

7. **Mineral Collection**—A collection of the various representative minerals of the State is kept. This now includes over 200 representative mineral specimens.

8. **Representative Core Collection**—A collection of cores from wells drilled in southern Arkansas is maintained by the Survey. This includes about 800 feet of core and is being increased from time to time.

Assistants employed during December 1, 1926—December 1, 1927, were:

Margaret Richards, Clerk-Stenographer.

Pearle Lowe, Draftsman to November 1, 1927.

Carl Blacklock, Draftsman, November 1, 1927, to December 1, 1927.

### III.

#### FUTURE WORK

##### I. Geological

Geological work planned for the year beginning December 1, 1927, includes the following:

1. Publication of the report on the oil and gas possibilities of the Lowland or Coastal Plain area of southern and eastern Arkansas by W. C. Spooner.

2. Publication of the report on the Upper Cretaceous Formations of southwestern Arkansas by Carle H. Dane.

3. Publication of the report on the conditions favorable for

gas accumulations in the Arkansas River Valley region of western Arkansas by Carey G. Croneis.

4. Completion of field work in connection with the zinc and lead report on northern Arkansas.
5. Publication of a State geologic map.
6. Completion of a detailed test well map of Arkansas.

New geological project undertaken during the year beginning December 1, 1927, will depend on the amount of money available. The following projects are now being planned:

1. Detail work on oil and gas geology.
2. A survey of the commercial clays of the State.
3. A survey of the sand and gravel deposits of the State.
4. A survey of the building stones of the State.
5. A survey of the phosphate-bearing rocks of northern Arkansas.
6. A study of soil loss due to erosion and its prevention.
7. A survey of the tripoli deposits of the State.
8. A survey of the underground water conditions in the rice district of eastern Arkansas.

In addition it is planned to investigate:

- (a) The antimony region of southwestern Arkansas.
- (b) The black marble area of northern Arkansas.
- (c) Certain parts of the iron-bearing area of north Arkansas.

## II. Topographical

Topographic work planned for the next year includes the completion on a co-operative basis of the field work of one 15' topographic quadrangle. The quadrangle to be mapped has not yet been selected.

## III. Stream Gaging Work

Stream gaging work which was begun during the year ending December 1, 1927, will be continued and the following new stations will probably be installed:

1. Cossatot River near DeQueen.
2. Ouachita River near Camden or Felsenthal.
3. Black River at Black Rock.
4. Bartholomew Bayou near Snyder.
5. Saline River near Warren.
6. Cache River near McCrory.

## IV. Soil Survey Work

It is planned to begin co-operative county soil survey work with the Arkansas University Agricultural Experiment Station and the U. S. Department of Agriculture as soon as co-operative funds are available.

## IV.

## FINANCES

## I. Appropriations

During the period from December 1, 1926 to June 30, 1927, while the department funds were regulated by Act 306 of the Acts of 1925, which provided an annual appropriation of \$7,500, the expenditures of the office according to department financial statements to the comptroller were as follows:

For salary of State Geologist.....	\$2,333.35
For Office Maintenance.....	614.59
For Traveling Expenses.....	156.72
For Extra Help.....	1,219.48
	<hr/>
	\$4,324.14

Act No. 329 of the Acts of 1927, provides for an appropriation of \$61,180 for the fiscal year, July 1, 1927-June 30, 1928, as follows:

**For the Geological Survey—**

For the salary of State geologist.....	\$ 4,000.00
For the salary of one assistant geologist.....	4,000.00
For the salary of one assistant geologist.....	3,600.00
For the salary of one assistant geologist.....	3,000.00
For the salary of two assistant geologists.....	3,600.00
For the salary of one draughtsman.....	1,560.00
For the salary of one clerk-stenographer.....	1,560.00
Services of chemist as required.....	500.00

**For the Water Power Survey—**

For the salary of one civil engineer.....	1,800.00
For the salary of four assistants.....	720.00

**For the Soil Survey—**

For the salary of one chief field man.....	1,800.00
For the salary of one assistant.....	1,320.00

**For Topographic Mapping—**

One-half of the cost of field expenses of surveyors to be expended co-operatively with the U. S. Geological Survey....	3,750.00
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**Maintenance of Office—**

Including printing of reports and bulletins, postage, telephone, telegraph, freight, express, traveling and field expenses, premium on bonds, and other necessary expenses not otherwise provided for herein.....	29,970.00
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\$61,180.00

## II. Actual Receipts

According to the State Treasurer's office, the income for the support of this department from the added tax on minerals for the second and third quarters of 1927 has been as follows:

April, May, June, 1927.....	\$ 9,635.70
July, August, September, 1927.....	8,965.32
	\$18,601.02

During these two quarters, the source of the department income has been as follows:

	Oil and Gas		Bauxite		All Others	
April, May, June, 1927.....	\$ 9,481.78	98.4%	\$118.13	1.2%	\$35.79	.4%
July, August, Sept., 1927..	8,820.10	98.4%	100.58	1.1%	44.64	.5%
Total.....	\$18,301.88	98.4%	\$228.71	1.2%	\$80.43	.4%

From the foregoing figures, it is evident that the amount available for the "State Geologist Fund" is dependent almost wholly on the oil and gas production of the State.

The total amount available for the fiscal year ending June 30, 1928, based on the sum actually collected for the second and third quarters, 1927, or \$37,202.04, falls short of the amount appropriated by \$23,977.96, and if the oil and gas production remains constant this means that there will be available only about 61% of the amount appropriated.

The expenditures during the fiscal year ending June 30, 1928, for the projects undertaken by the Survey, which have already been discussed, assuming that \$37,200 will be available in the fiscal year 1927-28, is estimated to be as follows:

### For the Geological Survey—

- \*Survey of Coastal Plain region.....\$5,887.00
- Preparation of text for publication of report on Upper Cretaceous of southwest Arkansas..... 1,405.00
- \*Survey of Ark. River Valley Region.... 6,571.00
- Survey of zinc and lead region..... 5,000.00
- Field work for State geological map.... 1,538.00
- Publication of "Outlines of Arkansas' Mineral Resources" and reprints..... 1,381.50

\$21,782.50 59%

\*Does not include publication costs.

**For the Topographical Survey—**

One-half of total field expenses, Eldorado Quadrangle .....	5,050.00	5,050.00	14%
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**For the Water Power Survey—**

Stream Gage installation and maintenance..	2,500.00	2,500.00	7%
<b>For Office Maintenance and Administration</b>		7,867.50	20%

Total of expenditures.....		\$37,200.00	100%
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**III. Co-operative Funds**

Funds available from co-operating agencies contributing to a portion of the expense of the State Survey are as follows:

Geological Survey	U. S. G. S.	Arkansas P. & L. Co.	Total Co-op- erative Fund	Ark. G. S.
1. Survey of zinc and lead region of Arkansas.....	\$ 5,000.00* <sup>1</sup>	.....	\$ 5,000.00	\$ 5,000.00* <sup>1</sup>
2. Dane Report on Upper Cre- taceous of S.W. Arkansas....	7,350.00* <sup>1</sup>	.....	7,350.00	1,405.00* <sup>2</sup>
<b>Topographical Survey</b>				
1. Topographic Mapping.....	5,050.00	.....	5,050.00	5,050.00* <sup>3</sup>
<b>Water Power Survey</b>				
1. Stream Gaging (installa- tion and maintenance).....	500.00	300.00	800.00	2,500.00
Total .....	\$17,900.00	\$ 300.00	\$18,200.00	\$13,955.00

\*<sup>1</sup> Includes field work only.

\*<sup>2</sup> Includes cost of preparing text for publication.

\*<sup>3</sup> Includes field work only—publication expense to be borne by U. S. G. S.

**V.****RECOMMENDATIONS**

It is perhaps too early at the present time to know definitely whether or not the provisions of Act No. 142 of the 46th General Assembly are going to produce sufficient funds for the biennium to maintain a reasonably effective public service and it may prove to be expedient later for this office to suggest that changes be made in the Act to meet conditions which may develop.

In order (1) that this Survey may receive the full taxes due under the provisions of Act No. 142, and (2) that more accurate statistical information concerning mineral production and value may be available to this office, it is believed that the Severance Tax Collecting Office of the State should be furnished with the expense funds and personnel sufficient to permit that office to make field checks of the quantities and values of the minerals produced in Arkansas as reported to them, and to conduct an active search for firms which are now severing minerals but do not pay a severance tax and are not now listed on the Tax Department books. This



recommendation has been discussed with Mr. Frank Beasley, Commissioner of Revenues, and he is in entire agreement with it.

It is believed that in this way some increase in tax revenue for the support of this department can be brought about. This suggestion applies particularly to oil and gas producers. In instances the Severance Tax records examined by this department (1) do not state the unit measurement of the mineral, (2) do not include the value of the quantity severed, (3) do not include figures indicating the quantity of any unit, and (4) do not list firms which are reported to be severing minerals. It is thus often impossible to check the records of the Severance Tax office against the quantity and value records of other statistical agencies, and in many instances, impossible to know whether the tax paid is correct or incorrect.