

Bull. No. 21

THE UNIVERSITY OF TEXAS MINERAL SURVEY

Min. Surv. BULLETIN NO. 6, JULY, 1903.

THE MINING LAWS OF TEXAS

AND

TABLES OF MAGNETIC DECLINATION.

BULLETIN OF THE UNIVERSITY OF TEXAS, NO. 21.

ISSUED SEMI-MONTHLY.

ENTERED IN THE POSTOFFICE AT AUSTIN AS MAIL MATTER OF THE
SECOND CLASS.

DEAR SIR: I take pleasure in sending to you a copy of Bulletin No. 6 of The University of Texas Mineral Survey, entitled "The Mining Laws of Texas," to which is added a Table of Magnetic Declinations. It is the sixth in a series of publications designed to further the mineral industry within the State.

The other five Bulletins issued by the Survey since its organization, in May, 1901, are as follows:

Bulletin No. 1. Texas Petroleum, July, 1901.

Bulletin No. 2. Sulphur, Oil and Quicksilver in Trans-Pecos Texas, February, 1902.

Bulletin No. 3. Coal, Lignite and Asphalt Rocks, May, 1902.

Bulletin No. 4. The Quicksilver Deposits of Brewster County (Terlingua), October, 1902.

Bulletin No. 5. The Minerals and Mineral Localities of Texas, December, 1902.

Inclusive of the special topographic map to accompany Bulletin No. 4, we have distributed 24,000 copies of our publications. The demand for them has been so active that we have no more on hand for distribution, save a few copies of Bulletin No. 5.

The other Bulletins that are to follow are:

The Southern Part of Brewster County and the Southeastern Part of Presidio County, including a discussion of the Silver-Bearing Rocks at Shafter and the Christmas Mountain Coal Field in Brewster County; Artesian and Other Underground Waters of El Paso County; Clays and Cement Rocks; the Coal Measures of the Carboniferous.

Very respectfully,

WM. B. PHILLIPS, Director.

Austin, Texas, July, 1903.

THE UNIVERSITY OF TEXAS MINERAL SURVEY
BULLETIN NO. 6, JULY, 1903.

THE MINING LAWS OF TEXAS

AND

TABLES OF MAGNETIC DECLINATION.

BULLETIN OF THE UNIVERSITY OF TEXAS, NO. 21.
ISSUED SEMI-MONTHLY.

ENTERED IN THE POSTOFFICE AT AUSTIN AS MAIL MATTER OF THE
SECOND CLASS.

LETTER OF TRANSMITTAL.

Hon. Wm. L. Prather, President, The University of Texas:

DEAR SIR: We have had so many requests for copies of the Mining Laws of Texas that it has been thought well to issue a special Bulletin containing them.

This Bulletin also includes an address on the Texas Mineral Lands and the Mining Law delivered before the International Mining Association, in El Paso, January 14, 1903, and Tables of Magnetic Declination for Texas, January 1, 1902.

Very respectfully,

WM. B. PHILLIPS, Director, Mineral Survey.

Austin, Texas, July, 1903.

INTRODUCTION.

The Mining Laws of Texas apply to mineral lands owned by the public school fund. The administration of these laws is in the hands of the Commissioner of the General Land Office, Austin.

The administration of the mineral lands belonging to the University is in the hands of the Board of Regents, whose chairman is Mr. George W. Brackenridge, San Antonio.

Two mining acts have been passed by the Legislature, one in 1889 and the other in 1895. The Revised Statutes of 1895 contain both of these Acts and they are given in the following pages.

For the most part the Texas Mining Laws follow the United States Mining Laws, but there are divergencies, of greater or less importance.

The total revenue derived from the lease or sale of mineral lands belonging to the public school funds or to the University is represented by a comparatively insignificant sum during the last fifteen years, being about \$11,000.

The reasons for this are discussed in the address on the Texas Mineral Lands and the Mining Law which follows the text of the Mining Laws in this Bulletin.

Tables of Magnetic Declination for 190 localities in Texas are appended, having been taken from the United States Magnetic Declination Tables and Isogonic Charts for 1902, United States Coast and Geodetic Survey, Washington. It is hoped that in this form they will be acceptable to county surveyors and others who have to do with such matters.

W. B. P.

Austin, Texas, July, 1903.

THE MINING LAWS OF TEXAS.

REVISED STATUTES, 1895.

TITLE LXXI.

MINES AND MINING.

Article	Article
Mineral school lands reserved from sale, except as provided.....3481	As to taking timber on mineral lands for development purposes.....3498
Mapping and classifying such lands.....3482	Reserved lands opened, etc.....3498a
Mining districts.....3483	Commissioner to map lands.....3498b
Extent of mining claims on certain veins or lodes.....3484	Mining districts created.....3498c
Posting notice of claim by locator.....3485	Mining claims limited.....3498d
Preliminary shaft, etc., application to survey, record of, etc.....3486	Locator to post claim.....3498e
As to assessment work and payments to State Treasurer, etc.....3487	Application for survey, requisites of.....3498f
As to ownership of lodes in face of tunnel, etc.....3488	Claimant must do what, pending patent.....3498g
Application for patents, etc.....3489	Rights accruing to claimant.....3498h
Location and patent of other mining lands, not included in article 3481.....3490	Conditions precedent to issue of patent.....3498i
Contesting issuance of patents, etc.....3491	Right of purchase.....3498j
Herein as to location made on land disposed of since Act of April 14, 1883.....3492	Contest of patent.....3498k
For forfeiture of claims, etc.....3493	Forfeiture of claims.....3498l
As to re-location of forfeited claims.....3494	Re-location of forfeited claim.....3498m
Reservation of minerals in sale.....3495	Applicant to make oath.....3498n
Herein as to placer mining.....3496	Placer claims subject to location.....3498o
As to procuring non-mineral land adjacent to lodes.....3497	Application may embrace other land.....3498p
	Purposes for which timber may be felled.....3498q
	Vested rights not affected.....3498r
	Proceeds appropriated.....3498s
	Surveyors to administer oaths, repealing clause.....3498t

Article 3481. All the public school, university, asylum and public lands containing valuable mineral deposits are hereby reserved from sale or other disposition, except as herein provided, and are declared free and open to exploration and purchase under regulations prescribed by law by citizens of the United States and those who have declared their intention of becoming such.

Art. 3482. It shall be the duty of the commissioner of the general land office to have a map made showing the location of all public school, university, asylum and public lands which are unsold; and it shall be the duty of the geological and mineralogical survey to examine all such lands as soon as practicable, and to designate such tracts as are apparently mineral bearing as mineral lands for the purpose of this title. If mineral lands are afterwards claimed to exist at other locations than are so designated, they shall also be examined and classified accordingly.

Art. 3483. It shall be the duty of the commissioner of the general land office to unite a suitable number of these mineral locations into mining districts, in each of which shall be a surveyor who must either be the surveyor of the district or county or a regularly appointed deputy, and an officer qualified to administer oaths.

Art. 3484. A mining claim upon veins or lodes of quartz or other rocks in places bearing silver, cinnabar, lead, tin, copper or other valuable metals, excluding deposits of iron ore, coal, kaolin, baryta, salt, marble, fire clays, valuable building stones, oil or natural gas, may equal but shall

School lands reserved, except, etc. (Acts of 1889, p. 116, §1.)

To be classified. Ib., §2.

Mining districts. Ib., §3.

Extent of claims. Ib., §4.

not exceed one thousand five hundred feet along the vein or lode. No such claim shall exceed twenty-one acres in total area. The end lines of each claim shall be parallel to each other, and all claims shall be in the form of a parallelogram or square unless such form is prevented by adjoining rights or boundaries of the section in which the claim lies. The locator under this title shall be entitled to the use of all the superficial area between the enclosing lines of the claim, and to all minerals thereon, and between the side and end lines extending downward vertically until the rights secured by posting are forfeited as provided, and in all conflicts priority of location shall decide.

Notice to be
posted by
locator.
Ib., §5.

Art. 3485. The locators of any mining claim shall post up at the center of one of the end lines of the same a written notice, stating the name of the locator and of the claim, and the date of posting, and describe the claim by giving the number of feet in length and width, and the direction the claim lies in length from the notice, together with the section, if known, and the county; and shall place stone monuments at the four corners, and otherwise described corners so that they can be readily found. The notice shall be placed in a conspicuous place so as to be readily seen.

Prelimin-
aries to
application.
Ib., §6.

Art. 3486. The locators shall, within three months after the date of posting the required notice, sink a shaft at least ten feet in depth by four feet square, or a tunnel of the same dimensions ten feet in length, or an open cross cut twenty feet in length, four feet or more wide and ten feet in depth at its shallowest part, and shall within said time file with the county surveyor or the district surveyor of the county, as the case may be, an application in writing for the survey of their claim, which application shall be accompanied with a fee of twenty dollars, unless its tender is waived, and also with an affidavit attached thereto that the required work, signifying it, has been done, and that the locators have found valuable mineral on the claim; and the affidavit shall state the date of the first posting of the notice on the claim by the applicants; and further, that the notice has not been post-dated or changed in its date. Upon receiving said application and fee the surveyor shall record the application, together with the affidavit, and he shall thereupon forthwith proceed to survey said claim and forward the field-notes to the commissioner of the general land office within thirty days after filing the application, in default of which he shall pay the aggrieved party such damages as he may sustain, and it shall be the duty of the applicants to see that the field-notes are so returned. The fee of twenty dollars shall cover all the services provided for in this article. In all other cases enumerated in this article the fee shall be the same allowed county clerks for similar services.

How pay-
ments to the
State to be
regulated.
Ib., §7.

Art. 3487. Annually after the filing of the application for a survey as herein before provided, the claimant shall, until after application is made for a patent as herein before provided, do one hundred dollars worth of work in developing each claim; but where claims adjoin, the amount of work may be done on one for all belonging to the same party. The value of such shall be estimated at what it could be contracted for at a fair cash price, but the cost of tools and implements and the expense of going to and returning from the mine shall not be included in said estimate. And shall in addition to this amount of work, annually pay to the treasurer of the state the sum of fifty dollars on each and every claim

filed upon, which amount shall be credited to the fund to which the land belongs upon which the claim is located; provided, that all amounts so paid shall be a credit upon the final payment for such land provided for in article 3489 of this title. Within one month after the expiration of each year, the owner shall make and file with the surveyor his affidavit, setting forth specifically what the work consists of in detail and the value thereof, and shall also file with the surveyor at the same time the receipt of the state treasurer for the amount of cash payment provided for herein or a certified copy thereof. Upon the failure of any one of several co-owners to contribute his proportion of the expenditures required in this title within the necessary time, the co-owners who have performed the labor or made the improvements, or paid the fees or other expenditures required in this title, may, at the expiration of the year in which the same is to be done, give notice in writing or notice by publication in a newspaper published in the county where the mining is, if any; if none in such county, then in the newspaper published nearest to the mine, for at least once a week for ninety days. If after such personal notice in writing or by publication such delinquent should fail or refuse to contribute his proportion of the expenditure required by this title, his interest in the claim shall become the property of his co-workers who have made the required expenditures. An affidavit by the co-owners forfeiting the interest of such delinquent shall, when recorded in the office of the proper surveyor, be sufficient evidence of such delinquency.

Art. 3488. When a tunnel is run for the development of a vein or lode, or for the discovery of mines, the owner of such tunnel shall have the right of possession of all veins or lodes within two thousand feet from the face of such claim, on the line thereof, not previously known to exist, discovered in such tunnel, to the same extent as if discovered from the surface; and locations on the line of such tunnel of veins or lodes not appearing on the surface, made by other parties after the commencement of the tunnel and while the same is being prosecuted with reasonable diligence, shall be invalid, but failure to prosecute the work in the tunnel for six months shall be considered as an abandonment of the right of all undiscovered veins on the line of said tunnel.

Art. 3489. Whenever the owners of any mining claim shall desire a patent, they shall, within five years after the filing of the application for survey, file their application for a patent upon their claim with the commissioner of the general land office, accompanied with the receipt of the state treasurer, showing that twenty-five dollars per acre has been paid by the applicant for patent to the state treasurer. No patent shall be issued in any case until the expiration of sixty days from the filing of the application. Upon filing said application the applicant shall cause to be published for four successive weeks, one insertion each week, in some newspaper published in the county in which the mine is situated, if there be any, if not, then in some newspaper published in the nearest county to the mine in which a newspaper is published, a notice stating the fact that application has been filed for patent on the claim (or claims), describing them clearly. A copy of the printed notice with affidavit that it has been published as required by this article, and that all the requirements of this title have been complied with, shall be filed with the commissioner of the general land office before the patent shall issue.

Ownership of
lodes in case
of tunnel, etc.
Ib., §§.

Patents.
Ib., §§.

After the expiration of thirty days after the last insertion of said notice patent shall issue unless protest has been filed.

Patents not
included in
Article 3490.
Ib., §10.
(Amend.,
1893, p. 100.)

Art. 3490. Any person shall have the right to purchase and obtain patent, by compliance with this article, on any public school, university, asylum and public lands, containing valuable deposits of kaolin, baryta, salt, marble, fire clay, iron ore, coal, oil, natural gas, gypsum, nitrates, mineral paints, asbestos, marls, natural cement, clay, onyx, mica, precious stones, and stone valuable for ornamental purposes, or other valuable building material, in legal subdivisions in quantity not exceeding one section; provided, that where any such parties shall have heretofore expended or shall hereafter expend, five thousand dollars in developing the aforesaid mineral resources of any of said lands, such parties shall have the right to buy one additional section and no more, and to include in the purchase any section, or part thereof, on which the work may have been done. The lands so purchased may be in different sections, and all embraced in one or more obligations not to exceed the quantity stated. The purchaser shall pay not less than fifteen dollars per acre where the lands shall be situated ten miles or less of any railroad in operation, and not less than ten dollars per acre where the land is over ten miles from such railroad; one-tenth of the purchase money to be paid in cash to the state treasurer, and the purchaser shall file the treasurer's receipt with the commissioner of the general land office, together with an obligation to pay the state of Texas the remainder in nine equal annual installments, with interest at six per cent per annum from date, subject to a forfeiture as in other cases. And all said lands are reserved from sale or other disposition than under this title; and where application is made to buy any of the lands herein named, except under this title, the purchaser shall swear that there are none of the minerals named in this title on said lands, so far as he knows or has reason to believe, or does believe; provided, further, that any party herein before named who shall, prior to the passage of this article, have been the first to work on said lands for the development of said mineral resources, and who has abandoned said work, and is qualified at passage of this article to buy, shall have a prior preference right of doing so for thirty days after this article goes into effect; provided, further, this article shall not authorize the sale of lands containing valuable deposits of gold, silver, lead, cinna-bar, copper, or other valuable metal.

Contesting
issuance of
patent.
Ib., §11.

Art. 3491. Any person desiring to contest the issuance of a patent may do so by filing with the commissioner of the general land office a protest setting forth the grounds of objection generally, and that protestant has an interest in the subject-matter, which protest shall also state that the same is presented in good faith and not to injure or delay the applicants, or any of them, and the same shall be verified by affidavit; whereupon it shall be the duty of the commissioner to withhold patent until the controversy is ended; provided, that if the protestant shall not, within thirty days after the filing of his protest, institute suit in the court having jurisdiction thereof in the county where the claims are located, his protest shall constitute no further barrier to the issuance of a patent. A certified copy of the petition or a certificate of the clerk of the court where suit is pending shall be sufficient evidence to the commissioner of the pendency of the suit and of the date of filing said suit. When the land in controversy lies partly in two counties, suit may be brought in

either. More than one claim shall not be embraced in the same patent or application. The suits here provided for shall be entitled to precedence of trial on the docket.

Art. 3492. When a location has been made and land disposed of by the State since the passage of an act for disposition of minerals on the land embraced in article 3481 of this title, if such location was made subsequent to the disposition by the state of such lands, and the locator or his assignees have not abandoned said claim, but are working it in good faith, the locator and his assignees shall nevertheless be entitled to the mineral and to the use of the superficial area as in other cases; and if the case is such that the fee in the land can not pass by patent, a patent may issue to all the minerals in the claims, and shall be a license from the state to enter upon and work said claim and extract the mineral therefrom. In cases provided for in this article when the fee does not pass, the price shall be twenty dollars per acre, and the locator or his assignee shall in addition, pay to the owner of the land in fee the fair value of the land so taken up by his claim, and roads and fences necessary to give him ingress and egress thereto, and be liable for any damages which may result to owner of the land in fee. All other provisions of this title shall apply to said location. (The act referred to is the act of 1883, page 4.)

Location on
land disposed
of since April
14, 1883.
Ib., §12.

Art. 3493. All claims upon which patent has not been applied for within five years next after the application for survey, or which have not been surveyed and the field-notes returned to the general land office within the time prescribed therefor as herein before provided, or upon which the assessment work has not been done, an affidavit therefor filed as provided by this title, shall be and are declared forfeited without judicial action of any kind and subject to location as originally, but not by any one interested in the claim at the time of forfeiture; and any location for or on behalf of any such party shall be wholly void. Whenever any such claim shall be re-located, the locators and each of them shall make affidavit that the location is made without any contract or agreement of any kind that any of the parties owning an interest in the location before re-location has or is to have any interest in the same. In all other cases where affidavit is required by this title it may be made by one or more of the parties cognizant of the facts.

Forfeiture of
claims, etc.
Ib., §13.

Art. 3494. No claim which has been forfeited for any cause shall be subject to re-location for a period of thirty days next thereafter; and the party owning the same may apply to the land commissioner within that time for relief, and if it appear to him from the proofs submitted that the forfeiture was not occasioned by the negligence of the owner, but by circumstances which he could not reasonably control, the commissioner may, within that time, in his discretion, grant relief against the forfeiture, and if he grant such relief he shall at once forward his order to that effect to the surveyor, who shall file the same for record in his office.

Re-location
of forfeited
claims.
Ib., §14.

Art. 3495. Whenever any application shall be made to buy or obtain title to any of the lands embraced in article 3481 of this title, except where the application is made under this title, the applicant shall make oath that there is not, to the best of his knowledge and belief, any of the mineral embraced in this title thereon, and when the commissioner has any doubt in relation to the matter he shall forbear action until he is

Reservation
of mineral in
sale of lands.
Ib., §15.

satisfied. And any sale or disposition of said lands shall be understood to be with a reservation of the mineral thereof to be subject to location as herein provided.

Placer
mining.
Ib., §16.

Art. 3496. Claims usually called **placers**, including all forms of metallic deposits, excepting veins of quartz or rock in place, shall be subject to entry and patent under like circumstances and conditions, and upon similar proceedings as are provided for vein or lode claims. All placer claims located shall conform as near as practicable with existing surveys and their sub-divisions, and no such location shall include more than forty acres for each individual claimant, and shall not exceed three hundred and twenty acres for any association of persons. The price which shall be paid for such placer shall not be less than ten dollars per acre, together with all costs of proceedings as before provided.

What may be
included in
patent.
Ib., §17.

Art. 3497. When non-mineral land, not contiguous to the vein or lode, is used by the prospector of such vein or lode for mining or milling purposes, such non-adjacent surface ground may be embraced and included in an application for a patent for such vein or lode, and the same may be patented therewith subject to the same preliminary requirements as to survey and notice as are applicable to veins or lodes; but no location of such non-adjacent lands shall exceed ten acres, and payment for the same must be made at the same rate as fixed by this title for the superficies of the lode. The owner of a quartz mill or reduction works, not owning a mine in connection therewith, may also receive a patent for a mill site as provided in this article.

Timber.
Taking
timber on
mining lands.
Ib., §18.

Art. 3498. Any owner or worker of mining claim under this title is authorized to fell and remove for building and mining purposes any timber or any trees growing or being upon unoccupied lands as described in article 3481, said lands being mineral and subject to entry only as mineral lands, under such rules and regulations as may be prescribed for the protection of timber and under-growth upon such lands and for other purposes.

Reserved
lands opened
to explora-
tion and
purchase, etc.
(Act, 1895,
p. 197.)

Art. 3498a. All public school, university, asylum and public lands specially included under the operation of this title, all the lands now owned by the state situated within the reservation known as the "Pacific Reservation," which were taken off the market and reserved from sale by an act approved January 22, 1883, containing valuable mineral deposits, are hereby reserved from sale or other disposition, except as herein provided, and are declared free and open to exploration and purchase under regulations prescribed by law, by citizens of the United States and those who have declared their intention of becoming such; provided, that all who have located and recorded valid claims under previous valid laws and have not abandoned same, but are engaged in developing same, shall have a prior preference right for ninety days after the passage of this title in which to re-locate same under this title.

Commis-
sioner to
map lands.
Ib.

Art. 3498b. It shall be the duty of the commissioner of the general land office immediately upon the passage of this title to have a map made showing the location of all public school, university, asylum and public lands which are unsold at that date, and it shall be the duty of the geological and mineralogical survey to examine all such lands as soon as practicable thereafter, and to designate such tracts as are apparently mineral bearing as mineral lands for the purpose of this title. If mineral

lands are afterwards claimed to exist at other locations than are so designated they shall also be examined and classified accordingly.

Art. 3498c. It shall be the duty of the commissioner of the general land office to unite a suitable number of these mineral locations into mining districts, in each of which shall be a surveyor, who must either be the surveyor of the district or county or a regular appointed deputy and an officer qualified to administer oaths. Mining districts created. Ib.

Art. 3498d. A mining claim upon veins or lodes of quartz or other rocks in place bearing silver, gold, cinnabar, lead, tin, copper and other valuable metals, excluding deposits of kaolin, baryta, salt, marble, fire clay, iron ore, coal, oil, natural gas, gypsum, nitrates, mineral paints, asbestos, marls, natural cement, clay, onyx, mica, precious stones or any other non-metallic mineral, and stone valuable for ornamental or building purposes or other valuable building material, may equal but shall not exceed one thousand five hundred feet along the mine or vein or lode. No such claim shall exceed twenty-one acres in total area. The end lines of each claim shall be parallel to each other, and all claims shall be in the form of a parallelogram or square, unless such form is prevented by adjoining rights or boundaries of the section in which the claim lies. The locator under this title shall be entitled to the use of all the superficial area between the enclosing lines of the claim, and to all minerals thereon, and between the side and end lines, extending downwards vertically, until the rights secured by posting are forfeited as provided; and in all conflicts priority of location shall decide. Mining claims limited, etc. Ib.

Art. 3498e. The locators of any mining claim shall post up at the center of one of the end lines of the same a written notice, stating the name of the location and of the claim and date of posting, and describe the claim by giving the number of feet in length and width and the direction the claim lies in length from the notice, together with the section, if known, and the county, and shall place stone monuments at the four corners and otherwise describe the corners so that they can be readily found. The notice shall be placed in a conspicuous place so it can be readily seen. Locator to post claim. Ib.

Art. 3498f. The locator shall, within three months after the date of posting the required notice, sink a shaft at least ten feet in depth by four feet square, or a tunnel of the same dimensions ten feet in length, or an open cross cut twenty feet in length, four feet or more wide and ten feet in depth at its shallowest part, and shall within said time file with the county surveyor or the district surveyor of the county, as the case may be, an application in writing for the survey of the claim, which application shall be accompanied by a fee of twenty dollars, unless its tender is waived, and also with an affidavit attached thereto that the required work, signifying that it has been done, and that the locators have found valuable minerals on the claim; and the affidavit shall state the date of the first posting of the notice on the claim by the applicants, and further, that the notice has not been post-dated or changed in its date. Upon receiving said application and fee the surveyor shall record the application, together with the affidavit, and he shall thereupon forthwith proceed to survey said claim, and forward the field-notes to the commissioner of the general land office within thirty days after filing the application, in default of which he shall pay the aggrieved party such damages as he may sustain, and in addition thereto shall be deemed guilty of a misdemeanor, Application for survey of claim; requisites of. Ib.

and on conviction fined not less than twenty dollars nor more than one hundred dollars, and it shall be the duty of the applicant to see that the field-notes are so returned. The fee of twenty dollars shall cover all the services provided for in this title. In all other cases enumerated in this title the fee shall be the same allowed county clerks for similar services.

Claimant
must do what,
pending
patent.
Ib.

Art. 3498g. Annually after the filing of the application for a survey as hereinbefore provided, the claimant shall, until after the application is made for a patent, as hereinafter provided, do one hundred dollars' worth in developing each claim; but where claims adjoin, the amount of work may be done on one for all belonging to the same party. The value of such shall be estimated at what it could be contracted for at a fair cash price, but the cost of tools and implements and the expense of going to and returning from the mine shall not be included in said estimate. Within one month after the expiration of each year the owner shall make and file with the surveyor his affidavit setting forth specifically what the work consists of in detail, and the value thereof. Upon the failure of any one of several owners to contribute his proportion of the expenditures required in this title within the necessary time, the co-owners who have performed the labor or made the improvements or paid the fees or other expenditures required in this title, may at the expiration of the year in which the same is to be done, give notice in writing or notice by publication in a newspaper published in the county where the claim is, if any; if none in such county, then in the newspaper published nearest the mine, for at least once a week for ninety days. If after such personal notice in writing or by publication such delinquent shall fail or refuse to contribute his proportion of the expenditure required by this title, his interest in the claim shall become the property of his co-workers who have made the required expenditures. An affidavit by the co-owners forfeiting the interest of such delinquent shall, when recorded in the office of the proper surveyor, be sufficient evidence of such delinquency.

Rights
accruing to
the claimant.
Ib.

Art. 3498h. When a tunnel is run for the development of a vein or lode or for the discovery of mines, the owner of such tunnel shall have the right of possession of all veins or lodes within two thousand feet of the face of such claim on the line thereof, not previously known to exist, discovered in such tunnel to the same extent as if discovered from the surface; and locations on the line of such tunnel of veins or lodes not appearing on the surface made by other parties after the commencement of the tunnel and while the same is being prosecuted with reasonable diligence shall be invalid; but failure to prosecute the work in the tunnel for six months shall be considered as an abandonment of the right of all undiscovered veins on the line of said tunnel.

Conditions
precedent
to issue of
patent.
Ib.

Art. 3498i. Whenever the owners of any mining claim shall desire a patent, they shall, within five years after filing of the application for survey, file their application for a patent upon their claim with the commissioner of the general land office, accompanied by the receipt of the state treasurer showing that twenty-five dollars per acre has been paid by the applicant for patent to the state treasurer. Whereupon such patent shall issue unless protest is filed as hereinafter provided for in article 3498k.

Right of
purchase.
Ib.

Art. 3498j. Within twelve months after the filing of the affidavit hereinafter provided for, any person or association of persons qualified as required by article 3498a, shall have the right to purchase and obtain

patent by compliance with this title, or any of the lands of the state which are specified or included in article 3498a, containing valuable deposits of kaolin, baryta, salt, marble, fire clay, iron ore, coal, oil, natural gas, gypsum, nitrates, mineral paints, asbestos, marl, natural cement, clay, onyx, mica, precious stones or any other non-metallic mineral and stones valuable for ornamental or building purposes or other valuable building material, in legal subdivisions, in quantity not exceeding one section; provided, that where any such parties shall have heretofore expended, or shall hereafter expend, five thousand dollars in developing the aforesaid mineral resources of any of said lands, such party shall have the right to buy one additional section and no more, and to include in the purchase any section or part thereof on which the work may have been done. The land so purchased may be in different sections, and all embraced in one or more obligations, not to exceed the quantity stated. The purchaser shall pay not less than fifteen dollars per acre where the land shall be situated ten miles or less of any railroad in operation, and not less than ten dollars per acre where the land is over ten miles from such railroad, one tenth of the purchase money to be paid in cash to the state treasurer on or before the expiration of the twelve months aforesaid; and the purchasers shall file the treasurer's receipt with the commissioner of the general land office, together with an obligation to pay the state of Texas the remainder in nine equal annual installments, with interest at four per cent per annum from date, subject to forfeiture as in other cases; and all said lands are reserved from sale or other disposition than under this title; and where application is made to buy any of the lands herein named except under this title, the purchaser shall swear that there are none of the minerals named in this title on said lands, so far as he knows or has reason to believe or does believe; provided, further, that any party hereinbefore named, who shall prior to the passage of this title have been the first to work on said lands for the development of said mineral resources and who has not abandoned said work, and is qualified at passage of this title to buy, shall have a prior preference right of doing so for thirty days after this title goes into effect; provided, further, this article shall not authorize the sale of lands containing valuable deposits of gold, silver, lead, cinnabar, copper or other valuable metal; provided, further, that any person desiring to acquire any lands under the provisions of this article shall have the right to prospect said land for a period of twelve months before making any payment thereon, upon condition that said prospector shall file with the proper surveyor his affidavit in writing, setting forth that he has gone upon the land in good faith with the intention of purchasing the same under the provisions of this article, and in said affidavit give a reasonable description of said land. After the filing of said affidavit the said surveyor shall immediately forward same to the commissioner of the general land office, who shall take said section off the market until the expiration of said twelve months after the filing of said affidavit with the surveyor.

Art. 3498k. Any person desiring to contest the issuance of patent may do so by filing with the commissioner of the general land office a protest setting forth the grounds of objection generally, and that protestant has an interest in the subject matter, which protest shall also state that the same is presented in good faith and not to injure or delay the applicants

Contest
of patent.
Ib.

or any of them, and the same shall be verified by affidavit. Whereupon it shall be the duty of the commissioner to withhold patent until the controversy is ended; provided, that if the protestant shall not within thirty days after filing his protest institute suit in the court having jurisdiction thereof in the county where the claims are located, his protest shall constitute no further barrier to the issuance of patent. A certified copy of the petition or a certificate of the clerk of the court where suit is pending shall be sufficient evidence to the commissioner of the pendency of the suit, and of the date of filing said suit. When the land in controversy lies partly in two counties suit may be brought in either. More than one claim shall not be embraced in the same patent or application. The suits here provided for shall be entitled to precedence of trial on the docket.

Forfeiture
of claims.
Ib.

Art. 3498l. All claims upon which patent has not been applied for within five years next after the application for survey, or which have not been surveyed and the field-notes returned to the general land office within the time prescribed therefor as hereinbefore provided, or upon which the assessment work has not been done, an affidavit therefor filed as provided by this article, shall be and are declared forfeited without judicial action of any kind, and subject to location as originally, but not by any one interested in the claim at the time of forfeiture, and any location for or on behalf of any such party shall be wholly void. Whenever any such claim shall be re-located, the locators and each of them shall make affidavit that the location is made without any contract or agreement of any kind that any of the parties owning an interest in the location before the re-location has or is to have any interest in the same. In all other cases where affidavit is required by this title it may be made by one or more of the parties cognizant of the facts.

Re-location
of forfeited
claim.
Ib.

Art. 3498m. No claim which has been forfeited for any cause shall be subject to re-location for a period of thirty days next thereafter, and the party owning the same may apply to the land commissioner within that time for relief, and if it appear to him from the proof submitted that the forfeiture was not occasioned by the negligence of the owner, but by circumstances which he could not reasonably control, the commissioner may within that time, in his discretion, grant relief against the forfeiture, and if he grant such relief he shall at once forward his order to that effect to the surveyor, who shall file the same for record in his office.

Applicant
to make
oath.
Ib.

Art. 3498n. Whenever any application shall be made to buy or obtain title to any of the lands embraced in article 3498a, except where the application is made under this title, the applicant shall make oath that there is not, to the best of his knowledge and belief, any of the minerals embraced in this title thereon, and when the commissioner has any doubt in relation to the matter he shall forbear action until he is satisfied. Any such sale or disposition of said lands shall be understood to be, with the reservation of the minerals thereon, subject to location as herein provided.

Placer
claims
subject to
location.
Ib.

Art. 3498o. Claims usually called placers, including all forms of metallic deposits, excepting veins of quartz or rock in place, shall be subject to entry and patent under like circumstances and conditions and upon similar proceedings as are provided for vein or lode claims. All placer claims located shall conform as near as practicable with existing surveys and their subdivisions, and no such location shall include

more than forty acres for each individual claimant and shall not exceed three hundred and twenty acres for any association of persons. The price which shall be paid for such placer shall not be less than ten dollars per acre, together with all costs of proceedings, as before provided,

Art. 3498p. Where non-mineral land not contiguous to the vein or lode is used by the prospector of such vein or lode for mining or milling purposes, such non-adjacent surface ground may be embraced and included in an application for a patent for such vein or lode, and the same may be patented therewith, subject to the same preliminary requirements as to survey and notice as are applicable to veins or lodes; but no location of such non-adjacent lands shall exceed ten acres, and payment for the same must be made at the same rate as fixed by this title for the superficies of the lode. The owner of a quartz mill or reduction works, not owning a mine in connection therewith, may also receive a patent for a mill site, as provided in this section.

Application may embrace non-adjacent non-mineral land.
Ib.

Art. 3498q. Any owner or worker of mining claim under this title is authorized to fell and remove for building and mining purposes any timber or tree growing or being upon unoccupied lands as described in article 3498a, said lands being mineral and subject to entry only as mineral lands, under such rules and regulations as may be prescribed for the protection of timber and undergrowth upon such lands and for other purposes.

Purposes for which timber may be felled.
Ib.

Art. 3498r. Nothing in this title shall ever be so construed as to either destroy, invalidate or impair any valid claim, right or interest existing in, to or concerning any lands whatever at the passage of this title, of any pre-emptor, purchaser, claimant, actual settler, locator, or other person whatsoever.

Vested rights not affected.
Ib.

Art. 3498s. The net proceeds of all sales of mining lands under the provisions of this title shall inure to the benefit of the State and the respective funds for which the lands mentioned in article 3498a are now set apart under the constitution and laws of the state, and it shall be the duty of the comptroller, state treasurer and commissioner of the general land office to see to it and have said proceeds so paid rightly placed to the credit of the particular and proper fund.

Proceeds appropriated.

Art. 3498t. For the purpose of effectually carrying out the provisions of this title all county or district surveyors are hereby especially authorized and empowered to administer oaths, take affidavits and make certificates thereof; provided, further, that all laws and parts of laws in conflict with this title, or any part thereof, are hereby especially repealed.

Surveyors to administer oaths; repealing clause.

THE TEXAS MINERAL LANDS AND THE MINING LAW.

An Address delivered at the Annual Meeting of the International Mining Association, El Paso, Texas, January 14, 1903,

BY

William B. Phillips,

Professor of Field and Economic Geology in The University of Texas, Acting Professor of Mining, and Director of the Mineral Survey.

The Land Office of the Republic of Texas was opened for business January 4, 1838, within two years after the Declaration of Independence. John P. Borden was the first Commissioner of the General Land Office, having been appointed by President Houston in 1837, and held the office until December 12, 1840.

It was not, however, until 1849, eleven years after the opening of the Land Office, that any estimate was made of the extent of the public domain. At that time the boundaries of Texas were somewhat uncertain, including a large portion of what is now New Mexico and the southwestern part of Kansas and extending in a narrow strip through the central part of Colorado into Wyoming. We will not, however, digress in this direction, as we have nothing to do with lands once owned or claimed by Texas and now alienated.

In 1849, under the governorship of George T. Wood, Robert Creuzbar reported to George W. Smyth, Land Commissioner, that the area of Texas was 379,054 square miles, or 242,594,560 acres. At that time there were outstanding claims amounting to 94,732 square miles, or 60,628,728 acres, leaving 284,321 square miles, or 181,965,832 acres. On November 1, 1851, Commissioner Smyth reported that inasmuch as Texas had ceded to the United States, in 1850, 110,937 square miles, or 67,783,054 acres, and inasmuch as claims, liquidated and unliquidated, amounted to 99,661 square miles, or 63,783,054 acres more, there would remain 174,705 square miles, or 111,811,506 acres. Some of these claims were subsequently decided in favor of Texas, so that the area may now be stated as 265,780 square miles, or 170,099,200 acres.

The balance of school lands remaining unsold September 1, 1902, was 22,080,225 acres.

I propose now briefly to sketch the attitude of the various Land Commissioners with reference to the public lands as ascertained from the several reports issued by the Land Office.

In his report to Governor Roberts, September 1, 1882, W. C. Walsh proposed that the public lands, which then seem to have embraced nearly 30,000,000 acres, should be classified as agricultural, grazing, timbered and mineral; that the ownership of all minerals which may be discov-

ered on lands hereafter sold should be reserved and remain in the public schools; that no right of purchase on account of occupancy and improvements on land not already sold should extend to or include the title to any such minerals, and that the discoverer of minerals should be guaranteed some preferred right, as an encouragement to prospecting. He also urged anew a recommendation made in 1878 that the public lands should be leased, not sold, or if sold, only to actual settlers. In speaking of the school land system Mr. Walsh uses the following terse language: "It is wrong in principle and worse in application."

In his report of 1884 to Governor Ireland Mr. Walsh says nothing on these subjects, nor in 1886.

R. M. Hall, Commissioner, in his report of September 1, 1888, to Governor Ross, had this to say concerning mining and minerals: "The laws now on the statute books, if operative at all, are totally inadequate to encourage the miner or protect the State. Prospectors have no security that they will enjoy the benefits of their discoveries, or be secured even in the possession of necessary improvements. While such uncertainty exists capital can not be engaged even for the working of mines heretofore sufficiently developed to assure rich returns. The consequence is, this important industry languishes and untold wealth must continue to lie buried until a wholesome law quickens the energy and means which are to lift it into light."

In 1889 the first mining act was passed by the Legislature and it continued in force until 1895, when it was revised and some of its provisions changed. The opening article of the Act of 1889 says:

"All public school, university, asylum and public lands containing valuable mineral deposits are hereby reserved for sale or other disposition except as herein provided, and are declared free and open to exploration and purchase, under regulations prescribed by law, by citizens of the United States and those who have declared their intention of becoming such."

The Act of 1895 retained this article substantially and added to it the following:

"Provided, that all who have located and recorded valid claims under previous valid laws and have not abandoned same, but are engaged in developing same, shall have a prior preference right for ninety days after the passage of this title in which to re-locate same under this title."

The Act of 1889 also provided for an examination and classification of lands which were apparently mineral-bearing by the geological and mineralogical survey, which had been established and organized in 1888. This survey was to proceed in conjunction with the General Land Office and the lands it was to examine and classify were to be designated by the Commissioner upon a map. The article requiring this duty of the geological survey is article 3482 of the Mining Law of 1889 and is as follows:

"It shall be the duty of the Commissioner of the General Land Office to have a map made showing the location of all public school, university, asylum and public lands which are unsold; and it shall be the duty of the geological and mineralogical survey to examine all such lands as soon as practicable, and to designate such tracts as are apparently mineral-bearing as mineral lands for the purpose of this title. If mineral

lands are afterwards claimed to exist at other locations than are so designated they shall also be examined and classified accordingly."

It will be observed that the Act of 1889 makes the geological and mineralogical survey, as it then existed, the sole authority for examining and classifying lands as apparently mineral-bearing, but the survey was to proceed only after the Commissioner of the General Land Office had prepared a map showing the location of all public school, university, asylum and public lands which were then unsold. Without such a map it does not appear that the survey was to examine and classify the lands as mineral-bearing. The Commissioner of the General Land Office did not have the right to classify lands as mineral lands (see *Colquitt-Tigner Mining Company, Limited, vs. Rogan, Commissioner*, Supreme Court Decision, Texas Court Reporter, Volume 4, No. 14, May, 1902). In spite of the fact that the law did not provide the means for carrying into effect article 3482, which has just been quoted, the geological survey did classify 372,247 acres in the counties of El Paso, Jeff Davis and Presidio in 1892 as mineral land, but no classifications were made in any other county.

The Act of 1889 went into effect, the geological survey was in active existence and ready to proceed upon the initiative of the General Land Office and the law said that it was to be the sole authority for classifying lands as mineral lands within the meaning of the title. How did the matter work out in actual practice?

In the report of Commissioner Hall to Governor Ross, covering the two years ending September 1, 1890, two years after the geological survey had come into existence and a year and a half after the passage of the Act of 1889, there is no allusion to the subject. According to that report not an acre of land had been examined and classified as mineral land.

In the report of W. L. McGaughey to Governor Hogg, covering the two years preceding September 1, 1892, there is no allusion to the matter at all. The geological survey, which was established and organized in 1888, came to an end in 1892, owing to a lack of appropriation for carrying it on. The reports of the Commissioner of the General Land Office during the existence of the survey do not allude to the examination and classification of mineral lands by it, and it is not until the report of Commissioner Rogan, for the two years ending September 1, 1900, that we find any allusion to the matter. In that report, page 28, Commissioner Rogan says:

"I find that the mineral lands belonging to the school fund, outside of one county, have never been classified as mineral lands, and only 372,247 acres in that county have been so classified."¹

The Supreme Court has held (*Colquitt-Tigner Mining Company, Limited, vs. Rogan, Commissioner*, Texas Court Reporter, Volume 4, No. 14, May, 1902) that the failure of the geological survey to classify land as apparently mineral-bearing did not exclude the land from being, in fact, mineral land, but this decision was rendered nearly ten years after the survey had passed out of existence. Since the discontinuance of the survey in 1892 there has existed no State authority for examining and classifying lands as mineral lands, for this authority was vested in the survey and in no other agency.

¹The lands so classified were in the counties of El Paso, Jeff Davis and Presidio

In his report to Governor Hogg, December 8, 1894, covering the two years preceding September 1, 1894, Commissioner McGaughey for the first time mentions mining lands and then but briefly, saying that there had been nineteen applications, embracing 2,516 acres, location not specified, nor the kind of mining.

In the report of Commissioner Andrew J. Baker to Governor Culberson for the two years preceding September 1, 1896, mention is made of four applications for mining claims, involving 2,560 acres, neither location nor kind of mining specified, and of three acres in El Paso county sold as mineral land. In his report to Governor Culberson for the two years preceding September 1, 1898, Commissioner Baker mentions having issued four patents to mining land, thirty-six acres, location not specified.

From 1889 to 1898 nothing whatever is said in any report of the Commissioners of the General Land Office respecting the examination and classification of mineral lands as provided for by Act of 1889. In his report to Governor Sayers, covering the two years preceding September 1, 1900, Commissioner Rogan explains the lack of information respecting the examination and classification of mineral lands, by saying, on page 29, that no appropriation had ever been made to carry into effect article 3482 of the Act of 1889. But he also says, page 28, that 372,247 acres of land had been so classified. We are at a loss to understand why this land was classified if no means had been provided for classification of any land. The map which the Commissioner, under the Act of 1889, was required to furnish to the geological survey was never prepared, the Legislature having failed to make an appropriation therefor. Consequently the geological survey did not proceed to examine and classify the mineral lands and nothing whatever was done, with the exception of the land classified in the counties of El Paso, Jeff Davis and Presidio, of which we have already spoken.

During the two years ending September 1, 1900, the applications for mining claims became much more numerous than before, possibly because of the discovery and development of the quicksilver ores in Blocks G 12 and G 4, Brewster county. In his report for these two years Commissioner Rogan says that he received \$1,304.04 on mining claims and that 250 applications, aggregating 5,100 acres, mostly in Brewster county, were pending.

The most interesting and significant statement that has ever been made by the General Land Office in relation to the effect of the mining laws upon the development of the State mineral lands occurs in this report of Commissioner Rogan. He says, page 28:

"The total sales of mineral lands under the mining laws aggregate 14,900 acres, which are held in 141 claims. Only four of these claims have been patented, aggregating forty-nine acres. The total amount paid on all claims since the Act of 1889 took effect, both principal and interest, amounts to the insignificant sum of \$8,968.35."

The mining Act of 1889 was unquestionably designed for the purpose of bringing in revenue to the State from the mineral lands, yet in thirteen years the total revenue, principal and interest, was but \$8,968.35, an average of \$682 a year. During the two years ending September 1, 1902, there was added to this \$1,950 for patents of four

claims (seventy-eight acres), so that during fifteen years the total revenue was but \$10,918.35, or \$721 a year, about \$60 a month.

In his report covering the two years ending September 1, 1900, Commissioner Rogan says:

"Some of the richest mineral lands are classified as grazing land and sold at \$1 an acre, and we have now on file hundreds of applications to purchase mineral lands that are classed as grazing lands. There are several million acres of mineral lands that are thus erroneously classified, especially in El Paso, Presidio and Brewster counties, and it is certainly the duty of the State to have these lands properly classified, so that the Commissioner of the General Land Office may be apprised of their real value."

In this same report Commissioner Rogan declares the mining laws to be "very unsatisfactory and uncertain" and to "fall far short of protecting the interests of the school fund."

For many years it has been held by State authorities and by private persons that in the undeveloped mineral resources of the public lands there was an extremely valuable asset. This belief has taken concrete form in legislative acts designed to promote mining. Two separate mining acts were passed, in 1889 and 1895, upon terms so liberal to the operators as to leave practically nothing to be desired. Every facility was afforded for entering upon the lands, for controlling them, for utilizing, during a term of years, the minerals that might be found, and for the final purchase. On these points Commissioner Rogan has said, in his report covering the two years ending September 1, 1900:

"An applicant to purchase a claim (about twenty-one acres) containing one of the precious metals has five years in which to pay for it, within which time he can work, develop and exhaust a valuable claim, abandon the same, and leave the State without paying one cent for it." He instances the possibilities with respect to sulphur, coal, etc. The law gives a purchaser the right to acquire a sulphur claim of 160 acres, paying one-tenth in cash and the remainder in nine annual installments. The cash to be paid is \$240 for the 160 acres. During the first year the purchaser could exhaust the deposit, sell the product and leave the State, allowing the remainder of the purchase money, \$2,160, to be declared forfeited, it is true, but without hope of recovery.

With respect to the sulphur lands in El Paso county, for example, the possibilities are even more striking. According to the provisions of article 3498j of the mining Act of 1895, the price of sulphur-bearing land ten miles or more from a railroad in operation is placed at not less than \$10 an acre. We will suppose that this is the price. An intending purchaser may file his application to prospect an entire section (640 acres). During the first year after such application is received and filed he has the exclusive right to prospect that section, to remove the mineral and dispose of it, paying nothing for the privilege. If, at the expiration of this first year, he decides to buy the land, he files another application, this time for purchase, and the law gives him a year within which to make the first payment of \$640, one-tenth of the purchase price. He thus gets the exclusive right to prospect and mine on 640 acres of land for two years for \$640.

And yet, in spite of these extremely liberal terms relating to occupancy and purchase, Commissioner Rogan declares (Report of Septem-

ber 1, 1900, page 29) "large quantities of sulphur have been taken from State school lands without any authority of law."

In his report of September 1, 1902, Commissioner Rogan says, page 42:

"It is openly and notoriously known that there are very rich copper, silver and cinnabar mines being worked in El Paso, Presidio and Brewster counties, from which rich ore of great value is annually being carried to the smelters. Much of it is being taken from the public school lands, under existing laws, without any remuneration to the school fund." In the same report he says:

"Altogether there have been 871 mineral claims filed during the last twenty years. Two hundred and seventy-one have been thrown back upon the State. Only eight, during the last twenty years, have been paid for and patented."

The net result of the mining laws, during the last twenty years, has been already stated, viz., a revenue of \$10,918.35. Only eight claims have been patented during that time, although 871 claims have been filed.

Now, we submit, is it not time to inquire into this matter and to ascertain why it is that so little revenue has been derived from what has been held to be so valuable? If the State of Texas possesses such valuable mineral lands, as many suppose and not a few have insisted upon, why is it that they have not been developed?

Two explanations may be offered.

First. The mineral lands are not as valuable as has been supposed.

Second. The conditions under which these lands, supposing them to be valuable, are to be acquired are not satisfactory to intending purchasers.

We will discuss these propositions in order.

The belief in the value of the mineral lands belonging to the public schools has not been based on evidence derived from actual prospecting and development. The unsold acreage belonging to the public school fund in Brewster county is 2,335,427; in El Paso county, 2,056,084; in Jeff Davis county, 775,541; in Pecos county, 2,328,192; in Presidio county, 1,736,230; in Reeves county, 911,783. This makes a total of 10,143,212 acres in trans-Pecos Texas alone. There is no sufficient evidence to show that much of this vast domain is mineral land. Failing such evidence, one may indeed assert that there are millions of acres of mineral lands in these counties, but when the proof is demanded it is not forthcoming. In so far as the State itself is concerned, the only authority that has ever existed for the classification of mineral lands has certified that 372,247 acres in three counties were apparently mineral-bearing, leaving the remainder to imagination. There is evidence enough to show that some of the public school lands in trans-Pecos Texas are mineral lands. There is also evidence enough to warrant the assertion that some of these lands are valuable and that mining operations could be conducted upon them with a reasonable hope of profitable returns. It is not to be held that in the trans-Pecos region or any other part of the State there are vast riches awaiting the hardy prospector. The untold wealth which has been supposed to lie within that charmed area is a product of the imagination. "The wealth of Ormus or of Ind" may indeed lie in the Quitman mountains, or the Chinati, or

the Chisos, or the Franklin, or the Carrizo, or the Sierra Diablo, but there is no sufficient evidence to this effect. Enough is known of the sulphur deposits in the northeastern part of El Paso county to warrant the belief that they could be profitably mined, and yet we do not know enough of them today to justify the assertion that large quantities of sulphur do exist there and that it can be profitably extracted and marketed.

Assays of material from many parts of the trans-Pecos region have shown that there are some good gold, copper, silver, lead and quicksilver ores. One successful silver mine has been worked at Shafter, Presidio county, for a number of years, and of late at least one profitable quicksilver mine has been worked in Brewster county, with others still to hear from.

Up to two years ago if one had been asked for evidence of the existence of vast stores of wealth in the public school lands in trans-Pecos Texas he could have pointed to just one successful mine in all that area, and today he can point to two, one at Shafter and one at Terlingua. We have assayed samples of gold ore from the trans-Pecos that carried two ounces of gold per ton, silver ores that carried four thousand ounces per ton, copper ores that carried 76 per cent of copper, lead ores that carried 77 per cent of lead and quicksilver ores that carried 80 per cent of quicksilver. These are exceptional values and it is idle to expect the run of mine to be anything like so good. And yet these assays indicate beyond question that in parts of the trans-Pecos there are ores that would appear to be worthy of attention at the hands of mining men. There are places in the trans-Pecos that are to be regarded as very promising, but no one can say that they are of frequent occurrence. It is an old rule in Colorado that if one prospect in seven turns out to be a good mine one should be satisfied. If this rule should be applied to the numerous prospect shafts and holes throughout the Quitman mountains or the Sierra Diablo, north of Van Horn, we might expect that a few of them would prove to be valuable. Take the old Hazel mine, for instance, in the Sierra Diablo. Ore to the value of about \$60,000 is said to have been obtained there and certainly some very rich ore was found, going as high, it is said, as 2,000 ounces of silver per ton, and we have ourselves assayed samples from that locality that carried 371 ounces of silver to the ton. Why was this mine suffered to lapse into innocuous desuetude? Who will make reply? Other instances of gold-silver ores in the trans-Pecos region might be given. They were prospected to some extent and abandoned. Why? There are excellent copper prospects in the Sierra Diablo, north of Van Horn, and we have assayed very rich ores from that district. Yet nothing is being done there now and the grizzled miner, with his sad-faced burro, is a thing of the past.

What are we to infer from the fact that in twenty years only eight claims have been patented and paid for out of 871 applications for claims? Are we to infer that there is nothing in the trans-Pecos region but a lot of abandoned prospects? Are we to conclude that in all that vast area, where nature has certainly placed the conditions for profitable enrichment of the fissures and beds, there is nothing to warrant the opinions that have been held and expressed by competent mining men? We think not. There has been entirely too much talk about the richness of the public school lands in that country. Hopes and expectations

have been raised to too great a height and what may be true of a limited area has been thought to be true of thousands, yes, millions, of acres. And yet the region is well worth attention, for it is traversed by mountain ranges which are known to be mineral-bearing north and south, in New Mexico and Old Mexico. Samples were obtained from one place and another that showed good ore and the conclusion was easily reached that such wealth lay stored in those barren hills as man had not yet gazed upon. And yet, how much do we know today about the Sierra Diablo or the Quitman mountains, the Chinati, or the Franklin mountains, here at the very doors of El Paso? With what care have they been studied and who has collected all the scattered data with respect to prospect shafts and holes?

With the exception of some work done by von Streeruwitz and Osann, on the former geological survey—and good work it was, too, when we consider the untoward conditions under which they worked ten or eleven years ago—we have almost nothing. There has been no systematic attempt to correlate the phenomena there, no detailed study of even a small part of the area. It is today, in so far as concerns an accurate knowledge of its geology, almost an unknown country. And it will remain so until the State undertakes to determine once for all the foundations upon which so many hopes have been based. From the very nature of the problem no private person can solve it. It calls for patient study by men who are trained for this particular work and they must be backed up by the resources of the State. There are more than ten million acres of the public school lands west of the Pecos river. By far the greater part of it, in all probability, will never come into use save for grazing purposes, and a great deal of it is not fit even for grazing if more than ten head of cattle are run to the section, and yet it is spoken of as the great mineral region of the State. From what is now known of it, and I speak solely from the standpoint of our present information, we may as well make up our minds that only a small fraction of it will prove to contain valuable mineral deposits.

What do we know of the conditions that control the existence and utilization of the most useful of all minerals, water? This does not come under the operation of the Mining Act and is to a certain extent outside of the purview of this address. And yet water is more useful than all the other minerals put together and heads the list of the necessities of life. It is more important even than food, for while men have been known to exist for forty days and more without food no one has yet been able to live ten days without water. It conditions the value of everything in the world. Instead of exciting the imagination with dreams of wealth to be derived from minerals and ores, in the ordinary acceptance of the words, we should devote our attention to studying the great mineral of all and provide means for supplying water to the vast arid area in the trans-Pecos. There are not millions of acres of mineral lands here, there are not even thousands, but there are countless acres that could be brought into cultivation if a supply of water could be depended upon. What hydrographic work has ever been done west of the Pecos river?

What do we know about the course of artesian and other underground waters in all this imperial domain? Almost nothing; less even than we know of the other minerals. Is not this a fit subject for investigation?

Are we to restrict the operations of any geological or mineral survey to the less important considerations and neglect the most important of all? Are we to continue to insist upon the vastness of the riches underground in the shape of the ores of gold and silver and copper and lead and quicksilver and allow the one upon which depends the value of all the others to escape us?

I say it with a full appreciation of the responsibilities involved in such a statement that the study of the conditions affecting the course of underground water and the storage of surface waters transcends in importance all of the investigations that could be carried on with reference to ores for the next one hundred years.

There is such a thing as holding a sixpence so close to the eye as to hide the remainder of the visible universe, and I am afraid that we have held the sixpence of smelter returns so close to our eyes that we have failed to see the far more important fields for agriculture and grazing. This may be an unpardonable digression and one may be warranted in objecting to a mention of water in an address on minerals and the Mining Law, but we are now discussing the matter in its broadest significance. There appear to be good mineral lands in the trans-Pecos belonging to the public schools and no pains should be spared in their investigation, but if this does not at the same time take into the most careful consideration the great water question we will be holding the sixpence too close. By all means let us study the ores of the trans-Pecos and advertise them to the four quarters of the globe. Let us cry aloud and spare not. But if we do not determine whether or no water can be supplied to these dry and thirsty lands we shall most signally fail to grasp the real value of the public school holdings in this portion of the State.

We now come to a consideration of the second explanation that was offered with respect to the lack of development of the mineral lands belonging to the public schools, viz.: that the conditions under which these lands, supposing them to be valuable, were to be acquired have not been satisfactory to intending purchasers.

It has been already shown that the law was especially favorable to the prospector and miner, that it was liberal to the point of generosity and that if it erred it was in the direction of not protecting the interests of the public schools, certainly not in the direction of failing to protect the operator. If he took up a mining claim of one of the precious metals he was given five years in which to pay for it and during this time he was not liable for any tonnage tax or other royalty. He could take up a sulphur claim of 160 acres and pay for it \$240. He could secure the exclusive right to prospect and mine for sulphur on 640 acres for two years for \$640, paying no tonnage tax or other royalty. Everything was done for him that the law could do and yet he did not go to work. Was it because he was dissatisfied with the title which the State was to give him? This may account for some of his hesitation, but could hardly have accounted for all of it. The reports of the Commissioners of the General Land Office have not always spoken of the titles as if they were beyond criticism.

W. C. Walsh, 1882, said: "The school land system is wrong in principle and worse in application."

In 1886 he said: "Thousands of acres of land, much of it in the more

thickly settled portions of the State, are held under worthless and fraudulent titles."

R. M. Hall, 1888, said: "Litigation in more than one judicial district has so resulted as to cast a doubt upon the validity of a large majority of the sales of land made by the State Land Board under the act of April 12, 1883." These sales appear to have included about 500,000 acres. In 1890, Mr. Hall said: "I regret to say that much has occurred with reference to our land titles to disturb, yes, almost destroy the world's confidence therein."

Charles Rogan, 1902, said: "There is no subject with which the Commissioner of the General Land Office, the Attorney General, the district judges, the Civil Courts of Appeals, the Supreme Court, the lawyers and the people have to contend that gives more concern, anxiety, trouble and annoyance than the practical administration of the school land laws since the passage of the Act of 1895. Who in all the State of Texas pretends to understand the present school land laws? * * * Texas land titles are in a deplorable condition. The people have but little confidence in them, and a law should be passed quieting them."

While the Act of 1895 with reference to mineral lands provides for a special procedure in acquiring title to mining claims, yet the mere fact that these lands are under the jurisdiction of the General Land Office lends some color to the suggestion that there has been some hesitation in acquiring them, owing to the suspicion that the titles are not sound. While personally I do not think that this has been the case to any great extent, yet it appears to have been so in some instances. The courts have upheld and will doubtless continue to uphold the validity of titles to mining claims which have been acquired in good faith and with due observance of the law.

We shall have to look further for an explanation of the lack of development. With some exceptions, and these almost invariably in favor of the prospector and miner, the Texas Mining Laws are the same as those of the United States and they afford sufficient protection to the mining industry. Where they fail to afford protection it is to the State, not to the operator.

In the trans-Pecos, and this is the mineral district of the State in respect of the holdings of the public schools, transportation facilities have kept pace with developments. This region is crossed from east to west by two main trunk lines, the Southern Pacific and the Texas & Pacific. The former enters at Viaduct, 215 miles west of San Antonio and 408 miles southeast of El Paso. The Texas & Pacific enters at Barstow, 395 miles west of Fort Worth and 219 miles a little south of east of El Paso. The Pecos Valley Railway, controlled by the Gulf, Colorado & Santa Fe, has 54.2 miles within the region, from Pecos City to State Line. The El Paso & Northwestern Railway has $19\frac{3}{4}$ miles, from El Paso to State Line. The Atchison, Topeka & Santa Fe Railway has 20 miles, from El Paso to Vinton. The Southern Pacific and the Texas & Pacific Railways use the same track from Sierra Blanca to El Paso, a distance of ninety-two miles. Neglecting the small trackage of the Southern Pacific beyond El Paso and the trackage of the El Paso & Northwestern as being inconsiderable in this particular matter, we have 628.5 miles of railroad within the trans-Pecos region. This gives a mileage of 2 per 100 square miles of area and of 1.7 per 100 of popula-

tion. Considering the nature of the country and the population this mileage has been sufficient to take care of the traffic. The area of trans-Pecos Texas is 30,880, square miles and the population, by the census of 1900, was 36,272. Taking the population of El Paso and the immediate vicinity as 18,000 we would have 18,000 persons inhabiting 30,000 square miles of territory, the population of El Paso in the State of South Carolina.

Railroad construction follows development of the mining industry, it seldom precedes.

If the railroads are assured of a steady shipment of freight they will go after it. But they must have this assurance. They can not afford to go into a mining camp unless there appears to be a reasonable hope of returns in the form of passengers and freight, chiefly the latter.

In spite of all precautions, railroads are sometimes built to mining districts which fail to meet the expectations, and we have at least one lamentable instance of this in the trans-Pecos, viz.: the line to the San Carlos coal fields. If railroad building in the trans-Pecos has not been pushed it is because there was no freight offering. It can hardly be that intending purchasers of mineral lands have been deterred by lack of transportation for their products, for the railroad companies are ready to extend their lines wherever the freight offers.

Excellent mining districts have been developed when every pound of freight, in and out, had to be hauled by wagons over long distances, and there is many a flourishing camp today of which the same may be said. A railroad is a fine thing to have, but it is not indispensable for such mining as may be carried on within the trans-Pecos, with the possible exception of sulphur, and even this might be hauled in wagons from the vicinity of Maverick Springs, El Paso County, to the Pecos Valley Railroad at Guadalupe.

The Kansas City, Mexico and Orient Railway, which is projected to cross Pecos, Brewster and Presidio counties to Presidio del Norte, is likely to bring some promising mining districts closer to rail connections than is now the case, i. e., if it follows the Alamito creek to San Jacinto peak and then to the southeast of Shafter to Presidio. But this line has not been located west of San Angelo, and speculations as to its probable route between San Angelo and Presidio del Norte are somewhat premature. The mines now in successful operation in the trans-Pecos, viz.: the silver mines at Shafter and the quicksilver mines at Terlingua, are types of mines that do not seem to require a railroad so much, for bullion and quicksilver are not bulky.

It has been thought by some observers that the absolute lease system, which applies in all of the counties west of the Pecos river, could be charged with some of the lack of development of the mineral lands. But these leases are given with the expressed stipulation that they may be canceled if the land is applied for as mineral land. Some of the sulphur-bearing lands in El Paso County are so leased and the State has reserved the right to cancel the lease if application is made for the land as mineral land.

It has also been held that the difficulty of knowing just where the boundary lines between the public school sections and the railroad and private lands were to be found has kept prospectors and miners from opening mining property. This has some foundation in fact. When

most of these lands were surveyed it was done by the railroad companies with the understanding that alternate sections of 640 acres were to belong to the railroad companies, being a land grant for construction purposes. Permanent boundaries, monuments, etc., were not always erected and it is now difficult, in many cases, to know which are the railroad sections and which are the public school sections.

The rough and arid nature of a great portion of the country, its remoteness from rail and its sparsely settled character, doubtless contributed to the inaccuracy of the survey and the absence of monuments, etc.

Magnetic variation, both secular and local, was not always considered as it should have been. The contract system, under which many of the surveys were made, did not always conduce to accuracy of results. Be the explanations what they may, the fact remains that it is often difficult to know where the boundary lines are, and in one case, at least, that has come to my notice, a prospector, after working for some time and spending his labor and money, thinking that the land was public school land, and therefore subject to entry as mineral land, found to his cost that it was not. The mining law does not require a survey of the section in which a claim or claims may lie, but provides only for the survey of the claim. The notice to be posted must state the section, if known, and the county, but the surveyor is not required to affix the boundaries of anything more than the particular claim, or claims.

The price that has been set upon the mineral lands has also had its share in retarding development. A mining claim may not exceed twenty-one acres in extent if it is "upon veins or lodes of quartz or other rocks in place bearing silver, cinnabar, lead, tin, copper or other valuable metals," and the price of this land is \$25 an acre, if patented. The survey of the claim costs \$20, and in addition \$50 must be paid each year on each and every claim filed upon, exclusive of the \$100 worth of work each year.

If the prospector takes out his patent at the end of the first year it will have cost him as follows:

Twenty-one acres of land at \$25.....	\$ 525
Surveyor's fee	20
Work to be expended upon the claim.....	100
Annual payment on each claim	50
Total	\$ 695

Claims embracing deposits of kaolin, baryta, salt, marble, fire clay, iron ore, coal, oil, natural gas, gypsum, nitrates, mineral paints, asbestos, marl, natural cement, clay, onyx, mica, precious stones or any other non-metallic mineral and stones valuable for ornamental or building material, may be acquired in legal sub-divisions in quantity not to exceed one section, unless one shall have spent \$5000 in development work, in which case he may acquire one section more. Where these lands are situated ten miles or less from any railroad in operation the price is fixed at not less than \$15 an acre, and at not less than \$10 an acre if the land is more than ten miles from such railroad.

The price fixed by the United States for mining land situated on the public domain is \$5 an acre. When this is compared with the prices asked for our lands it would appear that we have handicapped them by

asking from two to five times as much per acre as the United States asks for its mining lands.

The assumed value of our mineral lands cuts but a small figure in this matter when it is remembered that we have to compete with mining lands offered by the United States for \$5 an acre. The Texas mineral lands may or may not be extremely valuable; this has nothing to do with the question at issue. The question is, With what lands do they have to compete? One has only to glance at the enormous development that has taken place in Colorado, Arizona, Montana, Idaho, the two Dakotas, etc., to realize that in the race for mining supremacy low-priced lands have a tremendous advantage.

In order to ascertain the opinions of those who are acquainted with the condition of affairs in trans-Pecos Texas, I addressed a number of letters to prominent gentlemen in that region asking them to state the reasons why the mineral lands have continued to show such lack of development. One of my correspondents writes as follows:

"The private ownership of every alternate section keeps out prospectors. It is quite expensive, exploring for minerals, and when there is such uncertainty as to the exact location of public and private lands this expense becomes doubled. I have known prospectors to spend months in the mountains, and after finding something really good and having the same surveyed it was found to be on private land. As a general rule, private individuals offer small inducements to the miner, and the railroad companies owning most of these private surveys offer none at all."

This gentleman also expressed the opinion that there was among mining men a feeling that the laws do not sufficiently protect the miner and that the fear of legal complications with respect to titles has kept men with money to invest out of the district.

Another letter is as follows:

"In reference to the State mineral lands we beg to say that we think that the question of title has heretofore kept prospectors and capitalists from looking into and investing in these lands, and secondly, as the school lands generally lie in alternate sections, and as in a great many instances these lands have never been surveyed and boundaries established, it is hard to get investors interested."

Extracts from still another letter are as follows:

"In my opinion the chief reason why the mineral lands owned by the school fund have not been brought into use, nor developed more extensively than they have been, is because the State, so far as known at present, has no lands to speak of upon which there is sufficient indication of mineral in paying quantities to justify the expenditure of private capital in the prospecting, developing or purchase of such lands for mining purposes. It does not follow, from what I have said, however, that minerals in paying quantities may not hereafter be discovered and developed upon lands now owned by the State. The building of additional lines of railway through the trans-Pecos country; the peopling of that portion of the State with a more numerous population; cheaper fuel and labor, with increasing facilities for handling low grade ores, will, in my judgment, be the chief factors in such development in that portion of the State in the future, if such development comes at all. * * *

It is my judgment that this State, considering its large area, and not-

withstanding the popular belief to the contrary, is exceedingly poor in the more valuable metals, such as gold, silver, quicksilver, copper and lead, and whatever may be done by the State to encourage mining, I really expect but little development along these lines in the near future, on that account alone. One thing should be borne in mind, and that is that the mineral resources of the school lands cannot be discovered, developed or brought into use by imposing additional and discouraging burdens upon prospectors and mining enterprises, such as increasing the price of mineral lands, requiring them to be paid for in cash before the prospector has had sufficient opportunity, by development work, to ascertain whether or not his supposed discovery is really valuable, or by imposing a royalty upon the mineral taken out. If there has been little or no development of mines in this State heretofore without these burdens, it would hardly be reasonable to expect it in the near future with them. * * * Let the State pursue a liberal policy toward the prospector, the miner and the actual settler, whether he be farmer or stock raiser, in the disposition of her mineral and other school lands, and she may safely depend, in a large measure, upon them to discover and develop whatever natural resources such lands may possess. If they possess any the State will be amply compensated in the more rapid development and settling up of the country, the increase in taxable values, etc., for whatever she may suffer in the low price she has received for the land, or in her failure to secure a royalty upon the minerals taken out, just as the United States government has been more than compensated for the low price she obtained for her mineral lands by the rapid development of a number of the western States and territories."

This gentleman also says that he thinks that the State should provide for the examination of lands supposed to be mineral lands. His letter is among the best that I have received on this subject, and while I cannot agree with the rather pessimistic view he takes of the mineral resources of the school lands, yet I must say that his opinions are entitled to the highest respect. The keynote of this entire matter lies in an expression which he has himself used when he says "so far as known at present." I will not go so far as to say that the sole or even the main reason why these lands have not been developed is because we know so little about them, but that this has been and is now one of the main reasons for the lack of development no one can deny. The high price that has been placed upon mineral lands concerning which very little is known is responsible, in the larger degree, for the present situation. We have said, in effect, "we do not know these lands to be valuable, but, rather than take any risk in the matter, we will place on them a price from two to five times as much as mineral lands belonging to the federal government." We know very little about the value of the pig in the poke; he may be descended from an hundred Berkshire ancestors, or he may be the veriest "runt" or "razorback" that ever disgraced the ancient and honorable family of Porcus, but, before the string is cut, we assure the purchaser that the price is a great deal more than that of any government pig that ever clamored for liberty.

We are asking a high price for lands that may or may not be mineral lands in the commercial sense, however much they may be so in the sense of the Mining Act. There are mineral lands and mineral lands, and the

mere legal classification, satisfying the requirements of the statute, does not mean that the minerals to be found on them can be profitably used.

It would be useless to pursue the discussion further in this direction. Enough has been said to show the situation as it appears to the unprejudiced observer at this time, and we may now turn to a consideration of what may be done to better our knowledge of the mineral possibilities of the public school lands and to induce their development. Four suggestions may be offered:

1. There is a widespread belief in the State, and to it allusion has already been made, that the mineral lands belonging to the public schools are valuable. If this belief is to be supported by sufficient evidence it must be based on a more accurate knowledge of these lands than we have at present. They are State lands and the State must make good its claim that they are valuable as mineral land, not as farming or grazing land, however much the surface may be used for these purposes. If there is an available asset of mineral wealth in these lands it must be proven to the satisfaction of those who are asked to spend money on them. An asset that cannot be made good is no asset at all; it is worthless paper and is thrown out by the first bank examiner who goes over the books. Of the public school lands in the counties of El Paso, Jeff Davis and Presidio 372,247 acres have been classified as mineral land. None of this can be sold for less than \$10 an acre, and we have, accordingly, a valuation of at least \$3,722,470. Is any one prepared to say that these lands are worth this large sum, or that the State can indulge any reasonable expectation that this amount will ever be paid for them? If profitable mines of silver, or copper, or lead can be opened anywhere within this area it would not take long for the value of the products to reach even so great a sum as this, but these lands were classified as mineral lands ten years ago, and it is doubtful if the value of the mineral products removed from them during this period will reach a total of \$1000 a year.

If these lands are really valuable something more must be done than has yet been done to bring them to the attention of investors.

2. The price placed upon these lands must be reduced, so as to bring it into harmony with the price of mineral lands held by the federal government. The State of Texas is competing with the general government in the development of its mineral lands, and it is asking from two to five times as much for the land as the general government asks. One scarcely needs to inquire why development here is so slow.

Value is a relative term, not absolute. In comparison with other mineral lands, which are being developed and used on an enormous and profitable scale, the State lands are not so valuable as to warrant the price placed upon them. The revenue derived from them during the last fifteen years is so small as almost to be negligible.

I know that it is held by some, for whose opinions I have the highest respect, that the price of these lands is not too high, that in consideration of the value of the minerals to be removed from them it is absurdly low, and that if any change is made it should be in the direction of an increase rather than a decrease of the price. I regret that I am not able to take this view of the matter. I think that the price at which these lands are held has had a great deal to do with the lack of development. Considering the sparsely settled condition of the region, the timberless and

arid character of a large portion of it, and the unsatisfactory nature of our present information concerning it, the price asked, if not prohibitory, is at any rate a serious bar to development. I see no good reason why the price should not be placed at \$5 an acre, irrespective of the mineral character of the location, and I am not sure that even a less price would not be advisable. As a rule, a great deal of money has to be spent in prospecting and in mining before any property can be brought up to the point where a fair interest on the money invested can be expected. Of course, lucky strikes have been made and a little money has at times brought in very large returns, but this is far from being the case in most instances. But when a reduction in the price of these lands is proposed the objection is at once made that the inducements offered by the State are already sufficient and that nothing further should be done.

However great these inducements may be from the standpoint of the State, they have not been at all sufficient from the standpoint of the investor, always supposing, of course, that the lands are really valuable as mineral lands. Investors remain singularly indifferent to the claims that have been made and refuse to consider the question of purchase. They do go into Arizona, New Mexico, Colorado, etc. They spend a great deal of money there, and no small portion of it on prospects of no more promise than can be and are found in Texas. They have developed great copper and silver and lead mines and they have invested millions of dollars in machinery, appliances, etc. In Texas we make large claims and do almost nothing; in these other regions claims just as large are made and they are fortified by actual results. If the Texas mineral districts are of a value to be compared with others there can be only one explanation of the lack of development, viz.: that men with money to invest do not care to come to Texas. Why they do not is another matter, but that they do not is painfully evident.

3. The third suggestion that may be made with respect to the mineral lands belonging to the public schools is one that has already been made by the Supreme Court of Texas in a much more forcible and authoritative manner than any one else can do.

The Supreme Court of Texas has declared, in effect, that mineral lands are classified as such by the fact of the discovery of minerals upon them, and that it is not necessary that they should be classified by State authority. The far-reaching consequences of the decision in the case of the Colquitt-Tigner Mining Company, Limited, vs. Rogan, Commissioner, to which allusion has already been made, have not been taken by the people at large at their true value. The practical effect of this decision is to free the State from the necessity of classifying the mineral lands and to accentuate the necessity of examining them. In order that the Mining Act may apply it is not required that the lands should have been classified by State authority, for the only agency that was ever created by the State ceased to exist in 1892, after classifying a very small fraction of what was thought to be the great mineral belt. Rather than take the position that since that time there have been no mineral lands in the State, which would have been absurd, the court very properly held that the discovery of minerals, not legislative enactments, made the land mineral land. It is practically impossible for any geological or mineral survey, unless it had very large resources at command, to undertake the examination and classification of the public school lands in trans-Pecos Texas.

The boundary lines between State and private lands are not known with sufficient certainty in a great many cases to enable one to be sure of his exact location. This does not apply to such lands as are held by different counties in considerable amounts, or to the large and contiguous holdings of the public school fund, but it does apply to a very large area west of the Pecos river.

Again, except under unusual circumstances, no geological or mineral survey should be charged with the duty of prospecting, and it is only by such work that one can know, even with tolerable certainty, that valuable minerals do exist.

The only reasonable way out of the difficulty, it seems to me, is for the State to conduct a geological and mineral survey of the region, to publish such facts as may be found to exist, so far as possible, with maps and drawings, and leave the legal classification of the lands as mineral lands to take care of itself. If there is sufficient encouragement to the actual prospector and miner, claims will be located, but before he pays out any money it should be the duty of some State official, the county surveyor or the mineral surveyor, to ascertain if the proposed claim lies on the public land or on private land. The prospector should pay for the survey of the particular claim in which he is concerned, but he should not be made to pay for the survey which determines whether or no the claim is subject to entry. The alternate section plan has introduced not a little confusion. It would be impracticable, if not impossible, to change it now, so that we should seek to minimize its untoward effects. This would entail some expense, it is true, but it is idle to hope for the development of the mineral lands without expense. We have considered these lands as valuable mineral lands for many years. The belief is based on insufficient data, for the total revenues from them is less than \$11,000 in fifteen years.

4. Could not some system be devised by which the exact boundaries of the sections considered as mineral lands could be ascertained and permanently marked? There is not a very large area of the trans-Pecos that can be classed as mineral land. The sections falling under this head could be resurveyed and permanent monuments erected without great expense.

It would be possible to make an arrangement with the United States Geological Survey whereby the expense to the State would be reduced about one-half, and the result would be to bring the area into harmony with the government topographic maps. A striking case, illustrative of the divergence between the Land Office maps and the maps of the United States survey has recently come to hand, from Brewster County. Under a plan of co-operation between the University of Texas Mineral Survey and the United States Geological Survey about 600 square miles in the southeastern part of Presidio and the southwestern part of Brewster has been accurately mapped. It is known as the Terlingua sheet and embraces the quicksilver mines at and near Terlingua, Brewster County. The eastern boundary of this sheet is the line of 104 degrees west longitude, the northern boundary is the line of 29 degrees 30 minutes north latitude, the eastern boundary is the line of 103 degrees 30 minutes west longitude and the southern boundary is the Rio Grande.

After changing the scale of the Land Office map to correspond with

the scale of the government map there were notable discrepancies; in one case the over-lap amounted to about three miles.

What has been found to be the case in this particular area, containing, as it does, valuable deposits of quicksilver ores, is an indication of what may be expected elsewhere.

The topographic maps of the United States Geological Survey now cover an area of nearly 11,000 square miles in trans-Pecos Texas and comprise the following sheets: El Paso, Cerro Alto, Salt Basin, Rio Grande, Fort Hancock, Sierra Blanca, Eagle Mountain, Chispa, Valentine, Fort Davis, San Carlos, Marfa, Alpine, Ruidosa, Shafter, Polvo and Terlingua. In addition, two other sheets will be prepared within the next few months, Chisos and Van Horn. The Chisos sheet will embrace the area covered by these mountains, as also portions of the Carmen and San Francisco mountains, and the coal fields of the Christmas mountain, all in Brewster County. Work is now in progress on this sheet.

The Van Horn sheet, work on which will begin in September, will embrace the Sierra Diablo mountains, El Paso County, including the locality of the Hazel mine, which has furnished excellent copper and silver ore.

Considering that the United States maps are prepared with far greater accuracy than the maps of the Land Office, it would appear that some system of correlation between the two might be put into effect with advantage to all concerned. If the government had been asked by the State authorities several years ago when the topographic maps were in hand to establish section lines and place them on its maps a great deal of confusion might have been avoided. In addition to the nineteen topographic sheets previously mentioned there are forty-eight other sheets covering certain areas in the State, chiefly the middle block of counties between 30 and 33 degrees north latitude, and 97 degrees and 101 degrees 30 minutes west longitude. The area covered by these sheets is approximately 44,000 square miles, including the three sheets on Red River and the Flatonia, Uvalde, Brackett and Nueces sheets. The total area in the State covered by the government maps is approximately 55,000 square miles.

The suggestion that the aid of the federal government be secured in the accurate mapping of the area in trans-Pecos Texas not yet embraced in the topographic sheets, becomes even more pertinent when one remembers that of the twenty-two million acres of school land still unsold, more than ten million acres are west of the Pecos river. Of the thirty thousand square miles of territory west of the Pecos about eleven thousand square miles, as already remarked, have been covered by the government topographic maps, leaving about nineteen thousand square miles still to be surveyed. This area lies in El Paso, Reeves, Pecos, Brewster, Presidio and Jeff Davis.

During the last two years the University of Texas Mineral Survey has been able to co-operate with the United States Geological Survey, with the result that we now have additional topographic maps of the asphalt area in Montague and Cooke; the Terlingua quicksilver mining district, Brewster County, and the general Terlingua sheet. This co-operative work is now being extended over the Chisos mountains, Brewster County; the Christmas mountain coal field, Brewster County, and the Van Horn sheet (Sierra Diablo), El Paso County.

But these topographic maps do not show land lines, and for the reason that the engineers were not authorized to include them. The block and section lines appear on the map of the Terlingua quicksilver district, but more for facility of reference to localities described in the report than with any intention of vouching for their accuracy.

In order that the topographic maps shall show land lines accurately it will be necessary for the government engineers to establish them and this they can not do without State authority.

TABLES OF MAGNETIC DECLINATION FOR TEXAS, JANUARY 1, 1902.

In this connection it might be as well to publish a table of magnetic declinations for Texas, taken from the "*United States Magnetic Declination Tables and Isogonic Charts for 1902*," by L. A. Bauer, Chief of Division of Terrestrial Magnetism." These tables set forth in great particularity the latitude, longitude, date of observation, declination observed and the declination reduced to January 1, 1902.

For our purpose, however, it will be necessary merely to give the declination for 1902, and to arrange the stations in alphabetical order for convenience of reference.

MAGNETIC DECLINATION TABLES FOR TEXAS, JANUARY 1, 1902.

Station.	County.	Declination, East	
		Degrees.	Minutes
Abilene, 5 miles east of	Taylor	9	42
Abilene, 25 miles south of	Taylor	9	34
Abilene, 25 miles south of west of	Taylor	9	35
Albany	Shackelford	9	25
Amarillo	Potter	11	25
Alpine	Brewster	10	10
Anson	Jones	10	14
Anson, S. M.	Jones	9	50
Archer	Archer	8	2
Aspermont	Stonewall	10	49
Austin	Travis	8	5
Ballinger	Runnels	9	51
Bandera	Bandera	8	33
Bandera County .....	.....	8	30
Batesville	Zavala	8	24
Beaumont	Jefferson	6	53
Beeville	Bee	8	18
Bellville	Austin	8	3
Belton	Bell	8	23
Benjamin	Knox	9	53
Big Springs	Howard	10	14
Boerne	Kendall	8	26
Boundary	El Paso	11	28
Brackettville	Kinney	9	9
Brady	Mculloch	9	31
Brazos River, Fork	Stonewall	9	40
Breckenridge	Stephens	9	32
Brenham	Washington	8	00
Burnet	Burnet	8	26
Cameron	Milam	8	2
Canadian	Hemphill	10	29
Canton	Van Zandt	6	59
Carrizo Springs	Dimit	9	45
Center	Shelby	6	59
Cherokee	San Saba	7	33
Cisco	Eastland	9	00
Clairemont	Kent	10	10
Coleman	Coleman	9	19
Coleman County .....	.....	8	30
Colorado, 1900	Mitchell	10	48
Colorado, S. M.	Mitchell	10	46
Colorado County .....	.....	8	58
Columbia	Brazoria	6	59
Comal County .....	.....	7	26
Corpus Christi	Nueces	7	46
Ootulla	La Salle	8	42
Cuero	De Witt	8	14
Del Rio, S. M.	Val Verde	9	48
Del Rio, N. M.	Val Verde	9	24
Denison	Grayson	9	21
Dickens	Dickens	10	4
Dollar Point .....	.....	7	7
Douglasville	Cass	6	40
Dryden	Pecos	10	15
Eagle Pass	Maverick	9	19
Eastland	Eastland	9	3
Edna	Jackson	8	12
Eldorado	Schleicher	9	9
El Paso	El Paso	11	28
Eminence	Chambers	7	32
Erath County .....	.....	8	50
Floresville	Wilson	8	8
Fort McIntosh	Webb	8	14
Fort Worth	Tarrant	8	22
Fort Worth	Tarrant	8	25
Franklin	Robertson	8	29
Franklin County .....	.....	7	27
Fredericksburg	Gillespie	8	58
Frontera	El Paso	11	11

**MAGNETIC DECLINATION TABLES FOR TEXAS, JANUARY 1, 1902—
continued.**

Station.	County.	Declination, East.	
		Degrees.	Minutes.
Gail.....	Borden..	8	37
Gainesville.....	Cooke.....	8	59
Galveston.....	Galveston.....	6	58
Galveston I, east base.....	Galveston.....	7	16
Garden City.....	Glasscock.....	10	34
Georgetown.....	Williamson.....	7	58
Goldthwaite.....	Mills.....	9	10
Goliad.....	Goliad.....	7	54
Gonzales.....	Gonzales.....	8	11
Graham.....	Young.....	9	9
Granbury.....	Hood.....	8	18
Gregg County.....	.....	7	37
Groesbeck.....	Limestone.....	8	25
Guadalupe.....	Reeves.....	10	57
Guthrie.....	King.....	10	45
Hallettsville.....	Lavaca.....	8	26
Haskell.....	Haskell.....	9	46
Hempstead.....	Waller.....	7	27
Henderson.....	Rusk.....	7	42
Henrietta.....	Clay.....	9	1
Hillside Ranch.....	Bexar.....	8	21
Hondo.....	Medina.....	8	33
Houston.....	Harris.....	7	18
Houston.....	Harris.....	6	47
Jacksboro.....	Jack.....	9	7
Jasper.....	Jasper.....	7	8
Johnson.....	Blanco.....	8	58
Junction City.....	Kimble.....	9	5
Jupiter.....	.....	7	20
Karnes City.....	Karnes.....	8	27
Kaufman.....	Kaufman.....	7	57
Kent.....	El Paso.....	11	10
Kerrville.....	Kerr.....	8	27
La Grange.....	Fayette.....	7	26
Langtry.....	Val Verde.....	8	57
Lampasas.....	Lampasas.....	8	22
Laredo.....	Webb.....	8	12
Liberty.....	Liberty.....	7	11
Lindenau.....	De Witt.....	8	12
Llano.....	Llano.....	9	13
Longview.....	Gregg.....	7	15
McKinney.....	Collin.....	9	00
Marathon.....	Brewster.....	9	22
Marfa.....	Presidio.....	10	44
Mason.....	Mason.....	9	47
Matagorda.....	Matagorda.....	7	13
Memphis.....	Hall.....	9	42
Menard County.....	.....	8	27
Menardville.....	Menard.....	8	30
Midland.....	Midland.....	10	43
Mineola.....	Wood.....	7	25
Mineral Wells.....	Palo Pinto.....	9	00
Nacogdoches.....	Nacogdoches.....	7	39
Newton.....	Newton.....	7	24
Odessa.....	Ector.....	10	22
Orange.....	Orange.....	6	32
Ozona.....	Crockett.....	9	34
Paducah.....	Cottle.....	9	46
Paint Rock.....	Concho.....	9	47
Palo Pinto.....	Palo Pinto.....	8	59
Panhandle.....	Carson.....	10	36
Panola County.....	.....	7	39
Pass Carallo.....	.....	7	12
Pearsall.....	Frio.....	8	17
Pecos, S. M.....	Reeves.....	10	20
Pecos, N. M.....	Reeves.....	10	29
Pena.....	Duval.....	7	52
Plainview.....	Hale.....	11	13

MAGNETIC DECLINATION TABLES FOR TEXAS, JANUARY 1, 1902—
continued.

Station.	County.	Declination, East.	
		Degrees.	Minutes.
Pleasanton.....	Atascosa.....	8	28
Polk County.....	.....	7	54
Port Lavaca.....	Calhoun.....	7	25
Quanah.....	Hardeman.....	9	33
Rayner.....	Stonewall.....	9	25
Red River County.....	.....	8	11
Refugio.....	Refugio.....	7	59
Ringgold Barracks.....	Starr.....	7	26
Rio Grande, mouth of.....	Cameron.....	7	12
Robert Lee.....	Coke.....	9	59
Roby.....	Fisher.....	10	15
Rockport.....	Aransas.....	7	26
Rock Springs.....	Edwards.....	9	29
Rockwall.....	Rockwall.....	7	24
Rusk.....	Cherokee.....	7	29
Sabine River, mouth.....	Jefferson.....	6	49
San Angelo.....	Tom Green.....	9	25
San Angelo, N. M.....	Tom Green.....	9	29
San Antonio.....	Bexar.....	8	17
San Antonio.....	Bexar.....	9	24
Sanderson.....	Pecos.....	9	36
San Diego.....	Duval.....	7	45
San Patricio.....	San Patricio.....	7	44
San Saba.....	San Saba.....	8	56
Sealy.....	Austin.....	8	29
Seymour.....	Baylor.....	9	46
Sherman.....	Grayson.....	8	10
Sherman County, Oklahoma line.....	.....	11	12
Sherwood.....	Irion.....	9	35
Sierra Blanca.....	El Paso.....	10	44
Snyder.....	Scurry.....	10	25
Somervell County.....	.....	8	55
Sonora.....	Sutton.....	9	21
Spofford.....	Kinney.....	8	38
Stephenville.....	Erath.....	8	46
Sterling.....	Sterling.....	10	24
Sulphur Springs.....	Hopkins.....	8	5
Terlingua.....	Brewster.....	9	45
Texarkana.....	Bowie.....	7	17
Throckmorton.....	Throckmorton.....	9	34
Trinity River, Elm Fork.....	.....	8	47
Trinity River, West Fork.....	Dallas.....	8	45
Trinity Waters.....	.....	8	55
Uvalde.....	Uvalde.....	9	39
Valentine.....	Presidio.....	11	6
Vernon.....	Wilbarger.....	9	37
Victoria.....	Victoria.....	8	49
Wallisville.....	Chambers.....	6	47
Wharton.....	Wharton.....	7	41
Wied.....	Lavaca.....	8	5
Willis.....	Montgomery.....	7	41
Wilson County, S. corner.....	.....	8	44
Young County.....	.....	9	27

