1888

Report on the Sloss Co. Properties Contents of R - Limestone and Coal Lands

William Ruffner

Contents of R

Limestone Lands.

The two horizons of sub-carboniferous limestone, and the immense beds of Silurian limestone existing in this part of Alabama have been described, also the convenience of their outcrops in, and on each side of the Birmingham valley. For flux, the only questions pertain to purity and convenience of quarrying and carrying. Supposing that "mineral rights" include limestone, I may safely say that the Sloss Co. have an unlimited supply of limestone suitable for flux and all other purposes. I did not think it important for me to make any special examination of localities and qualities, as the chemist and stone quarrier are adequate for this service. The Sloss Co. own two tracts which were no doubt bought especially for the limestone, which is said to be good and easily quarried on both of them. I refer to the tract of 40 acres between Irondale and Trussville, and the tract of 80 acres 12 or 14 miles N.E. of Springville,

The supply unlimited.

Two limestone tracts.

in Sec. 21, both of which are sub-carboniferous. I did not visit either tract, & cannot therefore say whether the outcrops belong to the lower or upper of the two beds. Most probably they belong to the upper and purer bed, which is also the larger in most cases. I sent Mr. W. S. Forman to visit the more Northern tract, and he reported the outcrops to be very thick, of good quality, and in every way favorable for quarrying. Of course Mr. Forman could not tell how it would analyze.

Abundant in Springville Valley & Clayton's Cove.

The Springville valley abounds in limestones of various grades and horizons (and the same is true of Clayton's Cove), much of it apparently good.

The base & sides of the Red Mtns generally.

When describing the Clinton ore deposits I frequently called attention to the fact that in many places the Red Mountains are composed largely of Silurian limestones whose bold fronts are seen high on the mountain, in some cases extending to the top. This is true of a stretch immediately North of the village of Spring-

ville, where a large outcrop belongs to the Sloss Co. When the time comes to mine iron ore in this valley, no doubt limestone quarries will also be diligently worked.

Same in Murphree's Valley & at the Sloss Mines.

Similar remarks apply to the Murphree's Valley region where the Sloss Co. own endless masses of Silurian limestone of good quality, as for example on W. Red Mountain near Chepultepec, and in the gaps of the creeks. There is an extraordinary development of the lower bed of Sub-carboniferous limestone on the Lowden land 3 or 4 miles South of Chepultepec at the base of Blount Mountain. The bed of limestone is about 100' thick, which is a greater thickness than I have observed in this bed elsewhere. The quality is unusually good for the lower bed - in fact I saw no objection to it except that it stands vertical, and packed between hard ledges of metamorphosed sandstones and slates.

I do not know how much of the Trenton limestone outcrop

is included in the Irondale property, but along the West side of the mountain extending from Gate City Northward, the outcrops of this stone is prominent for miles, though it is nowhere vertical except near the Gap. You know how superior the quality is.

You are familiar with the large exposure of Trenton limestone at the Sloss mines, and have tested its quality. I need not dwell on this subject as it is not likely that there will ever be any embarrassment in regard to the supply of limestone for any and all purposes. Lime can be burned most cheaply with the screenings of the non-coking coals. This is not done anywhere in Alabama that I know of. I observed in the great kilns at Whiting, that wood was the fuel.

Limestone will be increasingly used for foundations, house-walls, and abutments. Birmingham will have stone churches after awhile.

Will be more & more used.

352

Other Building Stones.

Sandstones in various formations.

When sandstones are wanting for pavements, culverts and buildings, the Sloss Co. can furnish enough to build cities. These sandstones are to be found in the Clinton, the Sub-Carboniferous and the Carboniferous. The Coalburg property abounds in good building and flag stones, but care and skill are required in their selection. I was sorry to observe that in some important structures, a soft, argillaceous sandstone was used, at least in part.

Need of Care in selection.

The greatest care should be taken in selecting stones for the foundation of great stacks, ovens, chimneys, & heavy structures of all kinds. Of rock strata lying in close proximity to each other, one horizon may be suitable, whilst the one next above or below may be unsuitable for these large structures. There may be handsome appearance without either strength or durability, or there may be strength without

without durability. Buildings and chimneys sometimes fall mysteriously owing to the secret crushing or decomposing of the material. There is such a thing as the "tooth of time" whose gnawings should be watched by all who have charge of great structures, and thus disasters threatened by bad materials may be averted. The sculpturing of the face of a country is determined chiefly by inequalities in the strength and durability of its rocks. The weight of superincumbent masses, chemical forces, changes of temperature, wind, rain, frost, water currents, all war against the rocks, and tend to crumble them into dust.

& Testing of building stones.

It is only of late that systematic experiments and observations have been made to determine the marks of a good building stone. The experiments of Prof. Pfaff of Germany are giving us valuable results. Archibald Geikie of Scotland, Maj. Powell of the U.S. Geological Survey have also been making a special study

of this subject.

Marble good for a century.

Prof. Geikie, by the study of graveyard monuments, found that marble is good for a century, but that a pure siliceous sandstone is practicably indestructible. A sandstone however which contains clay, iron or lime, is not durable.

Sandstone indestructible.

Some slates very strong & durable.

Some clay slates, especially those found in strata metamorphosed by heat, are very strong and extra durable.

Advisable to open quarries.

Building stone being almost always wanted, I would recommend to the Sloss Co. to test the most promising outcrops, and open quarries for sale or use. There are many tests by which both strength and durability are determined. also facility of working.

3. The Coal Lands of the Sloss Co.

(For a vertical section of the Alabama Coal Field see page 416.)

20,000 acres of good Coal land

The Company own over 20,000 acres of coal land. In this I include only what I regard as valuable. Some tracts owned by the Company extend into the Carboniferous area, but give no promise of workable coal. These I do not include in the 20,000 acres. Of course there are inequalities in the value of the different tracts and groups of tracts as will be indicated in the detailed descriptions. Over 2000 acres of these lands lie East of Murphree's Valley in the Blount Mountain basin: the rest in the Warrior field.

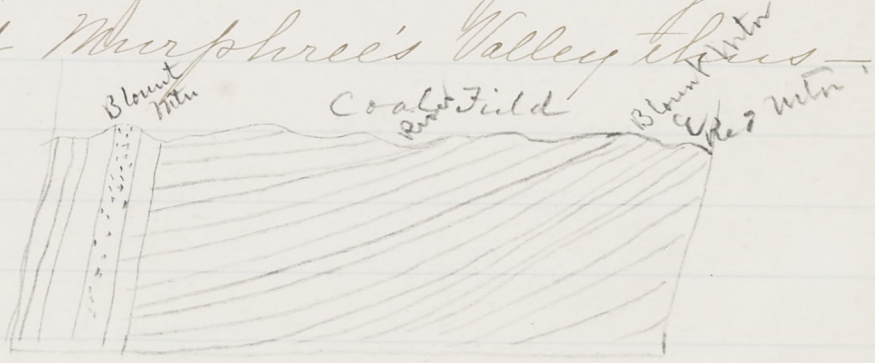
A. The Blount Mountain Coal Field.

Blount Mtn. coal-field not worked out & not likely by any geologist.

This field has never been studied fully by any competent Geologist so far as I know. My observations were confined to the Western part which borders on Murphree's Valley, and extends to the branches of Warrior River which head in this field. I did not feel that it would be right for me to spend much time

in this field, because there are but few openings on the coal seams, and more expense would have been incurred in a thorough examination than I supposed would be justified by the visible indications.

Gen. Gibson's views. Gen. Gibson has a high opinion of the Blount Mountain Coal Field. He is an assistant State Geologist, and has long resided close to the field, and studied it year after year. I think he is mistaken on some structural interpretations, but I will give the Sloss Company the benefit of his views as he gave them to me. He interprets Blount Mountain to be a monocline dipping gently N.W. from the Springville side toward Murphree's Valley thus—



He estimates the coal-bearing rocks to be 2000' in thickness, and puts the number of coal seams at about 15.

Nix section is as follows—

Gibson's Section of the Blount Mtn. Coal Field.

Descending.

Rock.

1. Coal seam in 2 benches.
   Coal – 24"
   Clay – 4"
   Coal – 12" —— 3'6"
   Soft.

   Rock — 60'

2. Coal – good – 3'8"
   Rock — 50' to 60'
3. Coal – good – 1'

   Large space of rocks.

4. Coal in 2 benches – 2'
   Roof & floor rock.
5. Coal – good 3'

On Warrior River at mouth of Sand Cr.

Rock.

6. Coal — 1'6"
   Fire clay bottom holding Kidney ore.

7. Large coal bed in river.
Never opened.
Rock.
8. Coal - good - 2'
Seen at mouth of Sand Creek.
9. Coal - good - 2'4"
On mountain beyond river.
10. The Caskie Seam - good - 3'8"
Other small seams lower.

I will not controvert Gen. Gibson's views, but will simply give my own impressions in regard to the Blount Mountain Coal Field, without claiming for them any high authority. My impression as to its structure is that at the South end it is a single basin, which Northward becomes two basins with gentle slopes, and that the measures are thickest in the West basin, and become thicker from South to North.

The authors views.

Section across W. half of Blount Coal Field.

As to the number of the coal seams, and thickness of the coal measures, I think that Gen. Gibson's figures are too high. As to the geological

The coal seams all supposed to lie geologically below the Newcastle

position of these seams I think that they lie below the horizon of the Newcastle, and that the Newcastle seam is probably wanting. From Carnes' Gap North I thought I saw indications of the Black Creek seam, and perhaps the Jefferson, but saw no evidence of the presence of anything higher in the series. There are, I think, two good

Two or three 3-foot seams.

3 foot seams, and perhaps more, in this field which some day will be valuable. They all thin out in some places.

a. Cloudus Gap.

I was upon all the Sloss tracts, and formed some opinion as to what might be expected from them. The tracts improve, as does the field generally, from South to North. The surface of the most Southern tracts has been more denuded than is the case farther North. The higher seams belonging to the Blount field may not be wholly wanting, but they can exist only in patches on the highest swells. This is true of the four tracts

lying E. & S.E. of Chepultepec in Sections 8, 19 & 30. These are all much cut by valleys, especially those in Section 8. If the Woodward, or Bynum seam exists in Section 8, it must be in very small patches, and the same may be said in regard to the next lower seam, the Carnes.

If the tracts in Sections 19 & 30, the one consisting of 2-40^s is badly denuded and lies low, the larger has on it some rather high swells.

I saw signs of what ~~Wood~~ Gibson called the Woodward seam at a number of places, but coned hear of but one clear opening - namely - near Maple Spring church, where I found the seam to show thus -

Exposure at Maple Spring Church.

Coal 7", Clay 12", coal 8½".

Quality fair: the bottom bench better than the top. Shale roof 3', above which is bluish gray steel-mixed sandstone. Gibson says this overlies the Carnes, described hereafter, but I coned see no sign of the latter, nor coned I hear from the residents of any other seam

363

as thick as the Woodward. I have seen the Carnes seam farther North not over 1' thick, and in this locality it may be too thin to attract notice. But I do not feel satisfied as to Gen. Gibson's opinion. This land is drained by the Nallmark Branch, and it is all easily reached through Cloudus Gap, which is opposite Chepultepec. I cannot regard these tracts as having any great value at present.

b. Allgood Gap.

Next comes the tract lying on both sides of the Cocksomb at Allgood's Gap. There are three to four hundred acres here that may be called coal land. I observed a thin seam in the vertical rocks, and also sign in the horizontal rocks near the Gap. I went on horse back as far as the River without being able to see or hear of any exposures worth attention. Gibson thinks that the Carnes seam coned be found here. I think it doubtful. Armstrong's Creek heads in this tract, and there are many valleys which give the prospector a chance.

As to the large tract lying N. E. from Allgood's Gap, chiefly in Sections 35 & 36, I drove over it in different directions having Gen. Gibson with me. The surface is generally smooth and level, and there is considerable population on it. I inquired of every body I could find, but could hear of no coal now opened. Tom Cornelius told of 5 different seams reported as existing within the area, but he admitted that they were very thin, none of them so much as 2'. My impression is that the region is geologically below the Carnes seam, and promises poorly. But on all these tracts it is worth while to test with a diamond drill.

c. Carne's Gap.

Going North we soon find higher rocks appearing, and, beginning with Section 18, all the Sloss tracts are valuable. In Section 18 we find a narrow valley at the junction of the Cockscomb (Blount Mountain) with the horizontal measures E. of it. This little valley runs N. E. passing Carne's Gap in

Better show here than further South.

Section 8. On the East side of the valley are to be found the outcroppings of a number of coal seams, two of which are in some places 3' thick, in a few places a little over 3', and in other places considerably less than 3'.

The best show is known as the Carnes bed, which was opened some years ago by Green Carnes. The opening is behind Carnes Gap in S.W. ¼ of N.W. ¼ of Sec. 8. Rising from the little valley aforesaid about 60' on the escarpment of the horizontal measures, we reach the cut in this seam, which now is partly caved in. It has been driven in some 20'. Three years ago in company with Mr. Thomas Seddon and Mr. Isaac Bynum I visited the same place, and got a good view of the face of the coal.

I then made the following notes upon it: coal, black, lustrous, columnar, inclining to slab off like the Pratt coal.

Carnes bed. Descending.

Good slate & sandstone roof.

Coal	10"
Slate parting	1/16"
Coal	10"
Slate parting	1/16"
Coal	8"
Slate	1"
Coal	2"
Rash	2"
Fire Clay	6"
Coal	5"

There are about 28" to 30" of good available coal that looks as if it might coke well. The blacksmiths are said to like it.

On the same occasion we followed the road farther into the coal field* and found an exposure of crushed coal 45" thick, which Bynum called the "Hog Wallow" seam. It seems to be about 30' higher in the series than the Carnes Seam. The coal was in so unnatural a state in this exposure that I could form no opinion as to quality or thickness.

Bynum or Hog Wallow Seam.

At a different place not far distant, I saw another opening on the same seam. There was too much water in the pit for me to get a satisfactory view of the coal: but it seemed to be lying in a natural state, and presented a good appearance so far as I could see it. Some bone, however, was visible. The rocks here as usual in this field dip gently N.W. This is usually called the Bynum seam and a thickness of 3' is claimed for it.

Pebbly Ridge.

The ground East of this exposure swells into a ridge rather higher than the Cockscomb (Blount Mountain) and the top of this ridge is strewed with pebbles. I did not see the parent rock which is said to show in other places. The "Hog Wallow" or Bynum seam appears to be about 50' below this pebbly horizon.

Old Isaac Bynum place, now De Bardeben.

From Section 8, I followed the little valley Southward behind the Cockscomb to Sec. 18. On my former visit, I saw here opened a seam which is not visible at present. It had been worked on the old Isaac Bynum place, and might be called a 3-foot

Section near Carnes Gap.

Descending

Sandstone, Conglomerate & Shales - - -	50'
Bynum Coal Seam -	3'
Sandstones & Shales -	30'
Carnes' Coal Seam - 1' to	3'
Shales & Sandstones	60'
Coal on De Bardeleben land	3'
Rock - - -	—
Coal - reported - ?	4'+

seam. Its place in the series is below the Carnes seam, perhaps 60'. During both my visits persons told of a thicker seam still lower in the series. The Carnes seam here has thinned to 1'. These exposures were on land said to belong now to Mr. DeBardeleben. I could not find any exposures on the adjoining Sloss lands, but the group of coal seams apparently continues on these lands.

d. Etowah.

The most promising field.

The remaining coal lands of the Sloss Co. in this field lie to the N.E. in Sections 4, 10, & 2, and carry the same seams which I have just described. The ridge mentioned awhile ago, called Raccoon Ridge, here has an increased elevation and its crest and part of the way down its sides, are heavily strewed with pebbles. Coal had been mined in considerable quantities at different points on this mountain, but the openings had all caved in, so that I could nowhere

This state of things seems to continue to Sec. 2, where the Sloss Co. have 160 acres underlaid by this seam. There is no opening on the company's land, but I saw quite a large digging on adjoining land. The lumps lying around look like the coal seen on Sec. 10.

Altogether I like the looks of these upper tracts better than any other seen in the Blount Coal Field: and have the impression that whilst the Newcastle seam is wanting, every thing below it is here.

I think it would be well for the company to buy the adjoining lands on the ridge.

I do not think it likely that these coals will any of them be wanted very soon, because the lands on the opposite side of Murphree's Valley in the Warrior Field are in many places more desirable - though perhaps not holding more than one or two additional seams - but of course

the time will come when all good coal will be wanted.

B. Lands in Warrior Coal Field.

These will be considered in three groups:

a. Gurley Creek & Self Creek.
The most Northern.

b. Blue Creek.
The most Southern

c. Coalburg, or Five Mile Creek.
The middle.

Also the Vance land. Besides these there are skirts of Sloss land in the Vance Group, (see Red Ore lands), which reach a short distance into the coal field. Three or four 40s at the North end, and four or five at the South end cross the Sand Mountain Conglomerate, and probably reach the outcrop of some of the lowest and smallest seams of the series. Immediately West of Vance Station in Section 27, I found the Tuscaloosa Company engaged in opening a coal bed about

400 yards West of the Conglomerate ridge. The strata at this point are so nearly horizontal, that I estimated the coal seam to lie only about 50 feet above the Sand Mountain Conglomerate. The following are the details of the seam.

Roof of Slate overlaid by Sandstone.

Coal - - - - - 3"
Clay - - - - - 3"
Coal - - - - 6"
Laminated Coal & Slate 6"
Slate - - - - 4"
Coal - - - - 20"
Sandstone bottom.

Some of the Sloss tracts probably take in the outcrop of this seam. But chances for coal here are so slim that I do not class any of the Vance tracts as coal land.

a. Gurley Cr. & Self Cr. tracts.

On the first addition of Barker's Land Map, a joint mineral right is put down on about 280 acres in S 33 T 14 R 2 E on the waters of Self Creek, but in the second edition this is

Gurley Cr. & Self Cr. Coal Region.

omitted. I describe it in the following notes, but if it was intentionally omitted the Sloss Co. have no property on Self Creek.

The Company's lands lie in or near the Gurley Creek basin: and chiefly North of the Creek. There are 1500 acres in all: only 40 of which are South of the Creek. The tracts are somewhat scattered as may be seen by a glance at the map; and it would be well to do some buying, selling and swapping.

See Section page 416

In regard to this part of the Warrior Coal Field, I would make the general remark that I saw nothing higher in the series than the Freel Seam which lies about 40 feet above the Newcastle, and this I saw fairly at only two places, (which will be described hereafter): but I saw indications of its presence in other places. This seam here has its usual thickness of about 3', but its quality is better than usual — less slate.

Freel Seam 40' above the Newcastle the highest noticed.

The Newcastle bed here lies

high on the higher elevations, but its areas are scattered and occupy but a small proportion of the entire area of the country. The line of its outcrop lies about two and a half miles North West of the Sand Mountain Conglomerate, and not far North of the locality under consideration it curves away to the West, and is no longer seen toward the North East.

In the Gurley Creek basin, especially on the North side, the strata lie undisturbed with a slight Westerly dip, and between the East outcrop of the Newcastle and the Locust Warrior River the visible country is made up of the coal measures from the Warrior Seam up to the Treel. I did not certainly identify the Warrior Seam, but am satisfied that I saw its horizon in the upper part of the trough of Gurley Creek. Of course all the seams to the bottom of the coal measures exist in the country and we might fairly expect to find them in a trough like that of Gurley Cr.

or of Self Creek, but their outcrops would naturally approach the surface nearer to Sand Mountain than the particular locality we are considering: but if in this locality all the seams from the Warrior to Freel can be found at the surface, the Sloss Co. here have all the good part of the Alabama coal series except the Pratt, and one or two smaller seams, such as the Curry.

The series supposed to run from the Freel down to the Warrior not.

The Freel, the Newcastle, the Jefferson, the Black Creek and the Warrior, are all seams of established reputation, except the Freel which has been but little mined.

Rufus Wells, guide.

In traversing this field, I had for guide Rufus Wells, P.O. Gurley's Creek, Residence NE¼ of NW¼ of S 17 T 14 R 1 W. He was something of a speculator in coal lands, and knew where openings were to be found, and could identify most of the Sloss tracts. The largest Sloss tract lies just North West from Mr. Wells' house, and on this probably all the before mentioned seams may be found, but the openings were all on land

owned by other parties. These openings are reported to have been made by Banks for the L. & N. Ry. Co.

Opening No. 1.

On the land of Edmund Ayres NE of SW of S 18 T 14 R 1 W. This corners on the single "40" owned by the company in the SW corner of Sec. 18. The coal here is evidently the Newcastle bed into which a wide cut has been made to the depth of 10 feet or more. The bed is in two benches separated by a foot or more of slate. The lower bench was concealed by water, but the upper bench showed a good face of 3'8", apparently free from slate. Every thing lay in place, but the coal had been reduced by weather almost to powder. No doubt farther under cover it is good firm coal.

Newcastle.

Mr. Wells said the bottom bench was 3' thick with considerable slate in it.

I noticed some lean black band iron ore lying loose near the cut, which Mr. Wells said formed

the bottom of the coal bed, and was 6" thick. Total thickness of the bed 7'10". The roof is slate 12" badly disintegrated or crushed, with sandstone overlying.

There did not seem to be more than 50 feet of rock and earth over the coal, and that was chiefly shale: which accounts for the condition of the coal.

Heavy as the Newcastle shale bed usually is it seemed to be unusually heavy in this locality. After observing it at a number of points, I estimated it to be at least 100 feet thick, with some bands of argillaceous sandstone. The main coal bed is about the middle of the shales.

Opening No. 2.

Fried

This is on Cosey's land, and on the "40" which adjoins the one just mentioned, and also the Sloss "40". It showed a face of good cubical coal 2'6". It was somewhat crushed. I could not discover any slate, but I have no-

ticed that where a coal outcrop is in a crushed condition all its slate may have been squeezed out, or on the contrary, cracks may have opened in new places in the face which have been filled with clay which sometimes has passed into the condition of shale. Dip here 3°. This seam is elevated about 40 feet above the Newcastle bed. It is probably the Freel seam. I saw the same seam at Melvin's in better condition and a little thicker as will be mentioned hereafter.

Opening No. 3.

Black Cr. On Abell's land at the head of Smith's millpond on Gurley Creek. N.W. of S.E. S. 21 T 14 R 2 W. The coal is very near the creek level in a vertical bluff. Some water at the bottom, but the thickness is about 3'. The coal is black, lustrous, clear of impurities, and had a very familiar look. The quality is first rate.

Immediately over the coal seam is hard slate which has

weathered into large rounded concentric masses whose surface scales off in thin layers. This rock mass is about 30 feet thick. I took the seam to be Black Creek. There is a peculiar look about this coal which I have never seen exactly duplicated. The strata here dip very gently down the creek which in that direction would put the coal seam below the water level in a few yards, but ascending the creek it would be found at an elevation convenient for mining.

Opening No. 4.

Jefferson

In the same vertical cliff which is about 60 feet in height & at an elevation of about 30 feet above the lower bed is another seam in a crushed state showing a thickness of 2'. The quality apparently good. This seam is reported to reach 4' in some places with slate partings in the lower part. The roof is sandstone, extending to the top of the hill. This is about the

place of the Jefferson seam, concerning which I know but little from personal observation.

Mr. Wells says that where these two seams rise high enough above the water, two other and smaller seams appear beneath them.

Opening No. 5.

This is on Reid's land in the N.E. ¼ of S. 2 T 14 R 2 W. It is so near the Sloss land that Wells thought it possible it might belong to the Sloss Co. The seam is 2' 2" thick with slate partings near the top, but the lower ¾ good coal overlaid by 4' of slate over which is a heavy bed of hard, gray, flaggy sandstone. Its exact place in the series I could not determine without farther examination. It is a favorite coal with blacksmiths, who have opened a long outcrop, and have gouged into it as far as they can conveniently reach.

No name. Probably overlies the Jefferson about 30'.

Opening No. 6.

On Targeti's land.

S. W. of N. E. S 12 T 14 R 2 W. The mineral right belongs to the Sloss Co. Here we have the Newcastle bed at least 8' thick, which was difficult to study because of water in the pit. It looked well and I made out to get the following measurements.

Newcastle

Top bench ---------- 4'
Slate ---------- 15"
Bottom bench, coal & slate -- 3'

The top bench seemed to be very good.

Opening No. 7.

Mallmark land.

Same as No. 5

S. E. ¼ of N. E. ¼ S 6 T 14 R 1 W. This is badly exposed. Has been much used by blacksmiths. The total thickness is something like 3' of good quality except a few inches at the top. It has been a good deal dug into by blacksmiths and is apparently the same coal as No. 5.

I rode across the Sloss land in S 26 T 14 R 2 W. There are no openings on or near it, but I think the Newcastle may be found on the high ground. I saw the smut of two thin

seams above the horizon of the Newcastle. W. M. Powell who lives not far away and has mined the Jefferson seam, says that there is a seam of 2'6" which lies 30 feet above the Jefferson. This may be Nos 5 & 7. He says he has frequently seen the Jefferson seam 3' to 4' thick with slate in the middle. He also said that he had measured the distance between the Jefferson and Black Creek seams and found it to be 27 feet. He gave 3' as the ordinary thickness of the Jefferson seam on Gurley Creek & Self Creek.

Opening No. 8.

S. E. ¼ of N. E. ¼ S 24 T 14 R 2 W. on Mellvin's land. Seam 2'8", good, firm, pure coal in which I was unable to discover any slate. I was compelled to regard it as the Friel seam, which is generally slaty, because it lies about 40 feet above what is plainly the Newcastle, which has been cut in the same hollow 100 yards lower down. The neighbors say that this seam is

generally 3', but it was not quite so much in this opening.

Opening No. 9.

Newcastle Near No. 8. An unusually good bed of Newcastle 5'6" thick, with a very small proportion of slate. The coal has the laminated structure, cubical fracture and shining lustre of the best banks of this seam.

The rocks dip 3° to 5° N. W.

Opening No. 10.

Visited the Self Creek basin under the belief that the Sloss Co. were the joint owners of the mineral right in 280 acres in S 33 T 14 R 2 W, which however as before intimated, may be a mistake. In crossing the creeks I noted that the trough of Gurley's Creek cuts about 40 feet deeper into the measures than Kelly's Creek, and that Self Creek in its upper reaches cuts deeper than Gurley's Creek. This fact ought to give the best mining facilities on Self Creek. But the

denudation here has been greater. The Newcastle seam and other contiguous seams have less spread here than they have North of Turley's Creek. The Newcastle is found only in patches on the highest hills. The lower seams show themselves above water on the upper reaches of the creeks, but on all the creeks the Sub-Newcastle seams all pass beneath the water level before reaching Warrior River.

Section 33 has but few deep hollows, which of course is a disadvantage in mining.

The only opening I coued find in this neighborhood was a little South of 33. It was near the top of a knoll about 125 feet above Self Creek, and was in the Newcastle bed. Only the upper bench showed above the water in the pit. This was 4 feet of good coal with a slate seam of 1" a foot from the top. Slight dip S.E.

Opening No. 11.

Newcastle

I also visited two pits at

at James McCombs, S 25 - T 14 R 2 W.
The pits were filled with water. But the appearance of the coal lying around and the alleged thickness of 6 feet indicated a good bank of Newcastle; which however lies too low for cheap mining.

General Remarks.

My impression about the Gurley and Self Creek basins is that the Newcastle here will give generally 4' of good, shipping lump coal, suited to boiler and domestic uses chiefly: the Freel and Jefferson seams, and possibly the Warrior are as good here as they can be found anywhere: better than in most places: and that the Black Creek is 4" to 6" thicker here than at the Newcastle mines, is of equal quality, and in many places lies better for mining.

The Newcastle Freel, Jefferson, Black Co., & probably the Warrior all good.

Hence I regard this group of Coal Lands as valuable, and as available for early use. Their

Property valuable

drawback is the scarcity of natural outcrops of the Black Creek seam, and the scattered character of the tracts. There is timber enough for all purposes, and easy approaches.

d. Blue Creek Coal Lands.

In my preliminary discussion of the Mineral Contents and Geological Structure of the Coal Fields, I gave some account of the Blue Creek region in which are to be found the Bessemer Company's "Little Basin", and ~~the property of~~ the Alabama Consolidated Coal & Iron Co.'s Mines. The Sloss Co. own 5,500 acres adjoining these properties: over 3000 of which are owned in fee simple. By reference to the Map and vertical cross sections accompanying this Report the location of the Blue Cr. region can readily be seen, and also its general structure.

adjoins Little Basin, + Ala. Consolidated Coal & Iron Co. Mines

It is about 20 miles from Birmingham, and the Mineral Railway touches its South East border.

The property of the Sloss Co. lies

in the valley of Big Blue Creek and in the high country between Valley Creek and Mud Creek.

Relief

The relief of the property consists of a line of depression on the South East side following the valley of Big Blue Creek along and near the outcrop of the so-called "vertical measures", this depression being say ½ a mile wide: and North West of this the surface rises into a mountain mass whose highest ridges rise from 300 to 600 feet above its deeper drainage valleys.

Structure

The geological structure is indicated in the cross section. Its South Eastern margin shows a very slight dip toward the North West. Then comes the group of vertical or faulted rocks 1500 feet wide, dipping 60° to 75° North West, sometimes less. These rocks run North East for about three miles across the Sloss property, with, however, small intervening tracts at four places. Northwest of these faulted or steeply dipping rocks the strata dip gently to the North West

at an angle from 3° to 5°, and seem to be regular on that side of the fault.

all dips N.W. at diff.t angles.

So that on the Sloss property there are three unconformable dips, though all of them pitch N.W., namely, a very slight N.W. dip on the S.E. margin, a generally steep, though varying dip in the faulted measures, and again a very gentle N.W. dip in the area W. of the fault.

Timber

Superficially almost the entire area sloped toward Blue Cr., and every part of it is easily accessible. The surface is smooth, and mostly covered with rather small timber, well suited for mine props and railroad ties. Much of the land also is arable.

Also the valuable coal seams to be found on this land.

In respect to the contents of these lands, they include nearly the whole of the Alabama coal series, certainly all the valuable seams. In fact, judging from all the testimony I could get in regard to the openings which have been made from time to time, it seemed to me that nearly

all of the valuable coal seams might be looked for in the faulted measures alone. But few of the openings remained in a condition for me to examine, and I scarcely supposed that it would be to the interest of the Sloss Co. for me to employ hands and systematically cut the seams on this large property. This work can be done by any good prospector, who would be guided by the liberal amount of development work which has been done on adjoining properties.

I only spent as much time as was necessary to satisfy myself in respect to the structure of the field and the coal horizons represented within the area.

With regard to the strip lying S.E. of the "vertical rocks", I presume that it all underlies the Newcastle, but I could hear of no developments worthy of my attention. Hence I did not study this marginal area: in fact, not much could be expected

from it.

I saw a number of openings in the faulted rocks, none of which however, I coned identify owing to their unnatural condition, except the Newcastle bed whose characteristic surroundings are always easily recognizable. In fact the outcrop of the Newcastle rocks along much of the line forms the crest of a low ridge which is the salient feature of the group.

The operations of the Alabama Consolidated Coal & Iron Co. are carried on only a short distance S. W. of the Sloss property. Their chief work consisted in driving a shaft down on the Newcastle bed which here dips at an angle of about 64°. I saw this cut when first opened in the Spring of 1887 by Hugh Friel. It was over 10 feet in thickness. In one place it seemed to be 12 feet with at least three slate partings and mud cracks running in different directions. Part of the bed was in a crushed condition, but there were 4' to 6' of good, solid,

stratified, cubical coal.

The Mining Co. had, when I was there in August 1888, gone down 175 feet without material change except in the thickness of the coal, which in one place came down to 6 feet. They were working in 9 feet when I was there. The coal as shown on the dump seemed to be in a crushed and powdered condition, as was also strikingly the case at the Little Basin Mines. This is of course partly to be accounted for by the blasting, but not wholly.

No doubt, important progress has been made at the Connellsville Mines since that time. The whole experiment of this Co. is very interesting and very valuable to the Sloss Co. as it will determine much respecting the value of the coal, and especially its coking qualities. And if prosecuted far enough, it will determine the depth of these steep dips, and whether the whole vertical block has been snapped

off from the horizontal measures, or whether as at the Woodward Coal mines it continues in connection with these rocks; and would thus allow of a continuous passage from the vertical to the horizontal rocks.

Coal seams in an abnormal condition peculiarly uncertain.

In general, operations prosecuted in coal beds whose physical and structural conditions are abnormal, are peculiarly uncertain: and only experiment can decide what the result will be. The Alabama Connellsville experiment has already rendered it highly probable that even in the faulted measures large quantities of good coal may be taken out at moderate, though not the lowest cost.

Seven thick seams claimed in faulted measures.

It is claimed by Isaac Parsons, Hugh Friel and other interested parties that in these faulted measures there are 7 seams of coal 3' and upwards. If this be true, and even if these seams should be plumped up at the outcrop to an unusual thickness

Much Coal may be mined out profitably

it is possible that some of them besides the Newcastle might be mined profitably down as far as they retain a goodly thickness. The Blocton mines are based on the abnormal thickness of its coal, & the Little Basin mines on the abnormal excellence of its coal. It is always to be expected however that seams unnaturally large and good at one place, will if followed become unnaturally small if not poor at some other place. I have seen a multitude of examples of this, and they suggest what is nowhere taught in the books that I know of, that at the time when the coal measures were flexed and faulted the coal was in a plastic state.

List of seams as given by Isaac Parsons.

I will now give the section across the faulted measures which Isaac Parsons gave me from memory. He said that it had all been measured and proved: that the distances between the seams were measured by chain on the surface. This of course would make a greater

distance across than the actual vertical thickness of the rocks. I have no sufficient reason to discredit Mr. Parsons' statement, but of course I cannot vouch for its accuracy.

Isaac Parsons' Section.

Beginning on the N. W. side of the faulted measures, and descending geologically.

Coal	7'
Rock	150'
Coal	3'
Rock	400'
Coal	2'
Rock	50'
Coal	5'
Rock	10'
Iron Ore	3'
Rock	8'
Coal	10'
Rock	100'
Coal	3'
Rock	50'
Coal	2'
Rock	100'
Coal	4'
Coal	2'
Coal	3'
	900'
	1412'

Mr. Parsons fails to give the thickness of the rock overlying the upper seam, but I can testify that it is very little. We may perhaps allow 1500' as the extreme distance across the faulted rocks.

a suggestion list.

It is worthwhile to consider this section even if we should not feel entirely certain of its correctness. Accepting the figures given, the real vertical thickness of this rock group from the top seam to the bottom seam is 1250', which happens to be just about the distance between the Pratt seam, the highest, and the Warrior seam, the lowest, of the coal seams now valued in Alabama. This is an interesting coincidence to say the least. Again, the ten foot seam, the Newcastle, is about 600' below the upper seam, and it so happens that this is about the distance from the Newcastle to the Pratt.

Seams identified tentatively.

Twenty one feet above the 10' seam is reported a 5' seam. Ordinarily we find a 3' seam (the Fresh) about 40' above the Newcastle.

On Mr. Parsons list we find a 4' seam 250 odd feet below the 10' or Newcastle bed, which is about the distance ordinarily between the Black Creek and Newcastle beds. This correspondence can not be found in every part of the Scale. In fact, some important seams appear to be wanting. But this fact is easily accounted for either by the failure to find the outcrops, or by the squeezing out or pressing back of the coal.

Coal & slate once in a plastic state.

In respect to slate I might make the same remark that I made awhile ago in regard to coal viz. that at the time of these great disturbances, the slate was also in a plastic state. Hence, we may naturally expect to find as great irregularities in the slate beds as in the coal beds.

With regard to the top seam claimed to be 7' thick, it lies so near the Western edge of the fault, that with a dip of 64°, it would soon pitch against the fault, and be cut off: but altogether this line of

a rich field for exploitation.

faulted rocks is far more interesting and valuable than any of the many other groups which I have seen similarly faulted. It may turn out that the Sloss Co. has in these "vertical rocks", as they are incorrectly called, a property of great value. It certainly deserves careful and thorough exploitation.

The nearly horizontal measures.

In respect to the nearly horizontal measures which lie to the N. W. of the great fault and which constitutes the bulk of this large property, I can say confidently that if I am right in supposing that the top seam on the high ridges is the Pratt seam, then we have here the entire Alabama coal series, from the Pratt downward, which so far as yet proved, constitutes the entire list of valuable seams. We are told that in Tuscaloosa Co. there are valuable seams geologically overlying the Pratt and this may be true: but their value yet remains to be demonstrated.

Contains all the seams.

Whilst the whole series is thus present on this large part of

the Sloss property, all the seams do not come to the surface, the lower half running too far below the surface to show any outcrops. I think that in this Western area the Pratt and the Curry are the only two valuable seams whose outcrops have been uncovered; but we may fairly expect that all the seams which are usually found between these two might be found outcropping on this high-lying property. I saw the smut of a seam below the Curry, which Parsons says is 16" thick, and is the lowest seam above the fault. Every thing below this horizon would have to be reached by shaft. I suppose that here the Newcastle bed lies upward of 200' beneath the surface measured from the outcrop of the Curry seam; and all the other seams below the Curry may be supposed to lie at their usual distances in the series.

Between the Curry seam and the Pratt there is here a vertical dis-

tance of about 250 feet, which is the usual distance between the two seams. The lower seam, or the one which I call the Curry is the one which has heretofore been called the Pratt by Mr. Friel, Mr. Parsons and others. At one time I think that Mr. De Bardeleben also gave it that name. Whether any of these gentlemen were serious in this designation, I do not know. It is certainly known to most people that at least in this part of Alabama, there is no 5' to 6' seam lying 250' above the Pratt: the Pratt being universally regarded as the top seam in the Jefferson Co. coal field. Moreover in this lower seam neither the thickness, the character of the coal nor the slate seams resemble those of the Pratt. I have called it the Curry seam because it seems to occupy the place in the rock series that belongs to that seam, and as a whole it has a look that is peculiar to itself. I have not seen the face of the Curry seam often, and never knew it to be mined. The

Curry Seam.

best exposure I ever saw was at the old Newcastle mines, where it is seen some 250' above the Newcastle bed. It was a very handsome body of coal, but not over 2'4" in thickness at that place. Mr. Douglas puts the usual thickness of the Curry seam at 3'. Mr. Aldrich puts it down at 2'2". From what I saw of it, I should say that in this Blue Cr. country it was from 3' to 4'9" in thickness, with a slate band near the bottom of from 2" to 12". The only exposure of the seam in question however that I could examine to my full satisfaction was in the valley of Mud Creek near Rogers' house. Here the coal was well opened on land adjoining the Sloss property. The total thickness of the seam was 4'9", which included a foot of slate 9" from the bottom.

Top coal - - - - 3'
Slate - - - - - - 1'
Coal - - - - - - - 9"

There was also a knife parting of slate in the upper bench. The quality of the coal is excellent: solid and

regular in its bed, firm in texture and cubical in fracture.

So far as I could judge, the dip of this coal seam does not exceed 4° N.W. I do not know that any experiments have been made to test its coking qualities, but it is certainly a valuable seam. It seems to gain in thickness from S.E. to N.W. I dubbed it "Parsons' Pratt" in honor of Isaac Parsons. It certainly has a great spread on the Sloss property, underlying over 2000 acres. Its horizon is a convenient distance above the base of the mountain, and it can be easily reached on three sides of the property.

Pratt seam. The top seam, the true Pratt, as I suppose, lies within 50' of the crest lines of the narrow-back ridges, which lie between Valley Cr. and Mud Cr. These narrow ridges seem to be generally connected with each other, and point out spur-like at various angles. They are generally short with steep sides and valleys between.

The coal seam may be conveniently mined at an indefinite number of places. The intervening valleys though steep are smooth: and "Raz. Miller" is quoted as authority for saying that the coal can be reached without difficulty by spur railroad: in fact, he is said to have located one line.

As to the area of this coal seam on the Sloss land, I could form no satisfactory judgement. Hugh Friel says that he surveyed and calculated it and that there are 1200 acres of it. I would have guessed a smaller number. The seam is found in sections 12, 13, 11, 18.

As to the coal itself there were but two openings on the Sloss property and they were not far apart. The one which was partially closed, showed about 3' of excellent coal, with 7" or 8" of coal and slate at the top. The other opening was well exposed. It is in the N.E. of S.E. of Section 12. Over the coal is slate about 30' thick. Over this lies a sandstone which weathers into a

boulder-like efcrescences; a characteristic rock known as the boulder sandstone, and found in connection with the Ratt seam on Five Mile Creek.

The coal at this place looks like the Ratt. It is lustrous, soft, columnar, or more strictly board-like, with a friable, "shoe-peg" structure. It is said to vary very much at different points on this mountain. Here it had greater thickness, and a larger proportion of slate scattered through the seam than I ever saw elsewhere, although I have heard of a similar state of things at some points which I never visited. I took the following details of this opening

Descending

Coal	5½"	Coal	1'10"
Slate	9"	Slate	1"
Coal	6"	Coal	4"
Slate	4"	Slate	3"
Coal	1'4"	Coal	2"
Bone	1"	Total	6'4"

A few of the openings which

I examined on the Coalburg property in 1882 though nowhere showing as great an aggregate thickness resembled this opening in having streaks of slate and bony coal distributed throughout the seam. As for example the Howell Pit, the Mooney Spring Bank, the Sam Lynn Bank and the Boyd Pit.

Details of the Boyd Pit in Coalburg.

Coal - - - 1½"
Slate - - - ¼"
Coal - - - 2½"
Slate - - - 2¼"
Coal with knife parting & slate 24"
Bony coal - - - - - - - - - - 10"
Three streaks of sulphur in the coal.

Total - 3' 10½"

Evidently coal containing so many partings of slate ought to be washed before coking.

I advise a thorough prospecting of this mountain not only with reference to the two

seams described, but to other seams which no doubt lie between. It should be remembered however that whilst there are three or four seams known to exist between the Curry and the Pratt, none of these seams have been deemed of sufficient importance to be mined at present. The more valuable part of the series (excepting the Pratt) lies below the Curry seam, and can best be found with a diamond drill in the horizontal measures.

In drilling there is considerable choice in localities. The valleys of Suck Creek, Dry Creek &c would probably offer the most eligible sites.

The Underground Structure of the Faulted Rocks.

Until the Connellsville Co., or some other, shall have driven a shaft all the way down through the face of one of the coal seams, any opinion respecting the underground structure of the faulted rocks must be largely conjectural. Yet we are not wholly without guidance in the matter. I think it may be regarded as settled that there is a true fault on each side of this block of tilted strata, and that the width of this block from fault to fault is about 1500 feet. It is also settled that the big bed on which the Connellsville Co. is mining is the Newcastle, and that its outcrop is between 600 & 700 feet from the Western edge of the fault.

Largely conjectural.

certainly one, probably two faults.

Respecting the nearly horizontal strata it may be taken for granted, as heretofore stated, that the Newcastle bed is something over 200 feet beneath the surface

on the West side of the line of fault.

Now the question arises as to what are the actual relations between the coal seams in the tilted rocks and the corresponding seams in the horizontal rocks. Are they dislocated and broken off one from the other, or do they curve under the ground so as to preserve their continuity? For example, does the great Newcastle bed continue to pitch downward on the same plane and at the same angle until it strikes the line of the Western fault, or on the other hand after disappearing beneath the surface at an angle of 64° does it suddenly bend off to the Westward so as to form a continuous sheet with the Newcastle bed of the horizontal measures? This last is the doctrine which has been industriously propogated by interested parties, and which is found figured in a well drawn vertical section along the margin of a large map of the Sloss property made two or three years ago for

are the beds continuous or broken off; which is

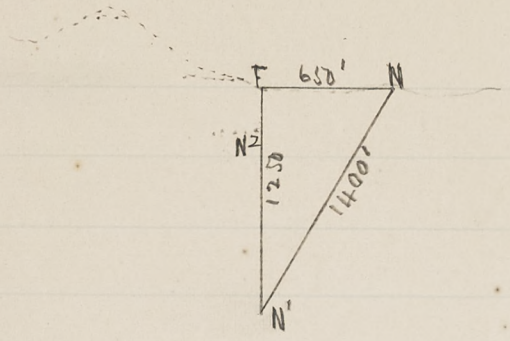
Interested parties insist that they are continuous

Col. Sloss.

Let us consider each of these theories, together with any possible modification that might serve better to account for the facts.

Hypotheses considered

1. Let us consider the most obvious theory, which is, that the rocks continue to pitch at something like an angle of 64°, until they are cut off by the fault. The question which first arises is how far say the Newcastle bed would have to go until the fault would be reached, measured both along the plane of the coal and also measured vertically from the top of the fault. This is an easy problem, for we have the measurement on the surface of the distance from the outcrop of the Newcastle Westward to the line of the fault. This is 650 feet. We have the angle of the dip, 64°, and we assume that the angle at the fault is a right angle; hence we have the following triangle.



Let N represent the outcrop of the Newcastle seam. F the top of the fault. Then the line N N' will represent the descending plane of the coal seam, and N' the point where it strikes the fault. Then of course the line F N' will represent the vertical distance from the top of the fault to the point of junction between the coal and the fault, or more strictly the point where the coal is cut off by the fault. A calculation shows that the line F N' or the vertical distance would be 1250 feet, whilst the line N N' representing the course of the coal seam would be a little over 1400 feet.

I have indicated on the vertical line the point where the Newcastle bed in the horizontal strata may be expected to reach

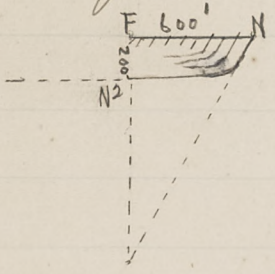
the line of the fault, and have marked the point N°2. This point as heretofore ascertained is only about 200 feet from the surface. Hence on the present hypothesis the Newcastle bed strikes the fault over 1000 feet below its natural point of connection. If this be true, though cut off from its continuation the Newcastle and other beds would still offer vast sheets of coal, the bottom of which would be reached only after many years of active mining.

Second hypothesis.

2. The second hypothesis is, that this great coal bed after starting downward at the angle of 64° soon curves Westward and joins the continuation in the horizontal measures, so that the miner, following the coal, would soon find the grade flattening and would meet with no difficulty in driving his entry to an indefinite length in the horizontal measures. The first hypothesis, though apparently improbable is

not squarely contradicted by any of the facts presented to us in nature. But this second hypothesis strikes me as physically impossible for several reasons.

(a.) The strata lying between the outcrop of the Newcastle and the fault are about 600 feet thick measured at right angles to the plane of the dip, and if one bends to connect with its continuation all must be supposed to do the same. Now the question arises how 600 feet of strata can be passed through a space only 200 feet in vertical height. Let us illustrate this by a diagram.



It is easier for a camel to go through the eye of a needle than for 600 ft of rock to go through a 200-foot opening.

The ~~vertical~~ thickness of the rocks from N to F is 600 feet and these are the strata which would have to be passed underground

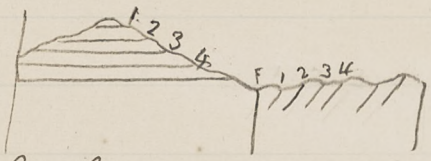
between J and N^2, a distance of only 200 feet, which is manifestly impossible, except on some violent and extremely improbable theory of pressure.

(b.) Another objection to the doctrine is that between N & J there are at least four coal seams; in fact as heretofore intimated the measurements render it probable that here are all the seams of the coal series which naturally belong to the space between the Newcastle and the Pratt.

Now arguing from our knowledge of the number and order of the seams in the horizontal measures, we would have no right to expect more than two workable seams between the surface of the ground and the Newcastle bed beneath. Then how are six seams to find their continuations even if there were room to pass them?

(c.) Moreover the seams in the horizontal measures which correspond with the upper four of the tilted seams are high on the

mountain from 50 to 250 feet above the top edge of the fault. This may be seen at a glance by a diagram.



I have numbered the four seams in the tilted measures nearest to the fault 1, 2, 3, 4, and have numbered the same seams continued in the horizontal measures with the same numbers, thus showing at a glance that the seams pitching into the ground wowed never meet their continuations, which are found on the mountain above.

3. It is not probable that any bed of coal in faulted measures wowed keep in a direct plane for 1500 feet below the surface. It is more likely that there is considerable changing of the dip, produced by subordinate fractures and dislocations in the body of the faulted strata. But it is not

possible to form any hypothesis in respect to these dislocations. The true tale must at last be told by the miner's drill.

But all this does not destroy the hope that vast amounts of coal may be taken conveniently from these faulted measures.

As a whole, this Blue Creek property is very valuable as well as interesting.

Section from the Pratt Seam to the Warrior Seam.

Pratt seam	2' to 7'
Fire Clay	2' " 10'
Sandstones & Shales	20' " 30'
Coal	1'6" " 2'6"
Fire clay	1' " 1'6"
Conglomerate, Shale & Sandstone	30' " 40'
Coal (often very slaty)	2'6" " 17'
Sandstones & Shales	25' " 175'
Coal (slaty)	10" " 8'
Fire Clay	2'
Shales & Sandstones (sometimes containing black band & kidney ore)	10' " 30'
Jacks Seams: Coal with slate partings 2'4" to 9'6" / Sandstones & Shales 0 to 12' / Coal with slate partings 6'	2'4" " 27'6"
Fire Clay	3'
Sandstones & Shales	20'
Curry seam (slate parting)	2'4" " 3'9"
Sandstones & Shales	30'
Campbell seam (slaty)	0 " 8'
Shales & Sandstones with 2' conglomerate	60'
Coal (often wanting)	2"
Sandstone	20'
Coal	4" " 1'

Sandstones & Shales ---------- 50'
Friel Seam ---------- 2'6" to 3'
Shales & Sandstones ---------- 20' " 40'
Black Band ---------- 0 " 2'
Shale and Sandstone ---------- 5' " 20'
Newcastle bed ---------- 2' " 14'+
[Kidney ore usually in the
shales above & below.]
Shales and Sandstones ---------- 15' " 60'
[Heavy beds of dark shale
predominate both above &
below the Newcastle bed.]
Alsop Seam (slaty) ---------- 10" " 3'6"
Fire Clay ---------- 1' " 3'
Sandstone ---------- 10' " 50'
Coal ---------- 0 " 2'6"
Shales & Sandstones ---------- 15' " 25'
Black Band ---------- 0 " 1'4"
Sandstones & Shales (sometimes
containing Conglomerate) ---- 15' " 20'
Coal, soft, 0 to 2'9"
Fire Clay 1'
Shales 12' } ---------- 0 " 21'
Coal, slaty & pyr-
ites, 0 to 4'9"
Bituminous Shales &
Sandstones ---------- 20' " 25'
Conglomerate ---------- 16' " 40'

Coal, bony		1' to 3'
Sandstones & Shales		25' " 105'
Powell Seam		4" " 26"
Sandstones & Shales		30' " 50'
Jefferson Seam: Coal, slate parting	2' to 4'	
Sandstones	0 " 9'	
Coal	0 " 16"	2' " 19'
Sandstones	0 " 4'	
Coal	0 " 9"	
Fire clay		3'
Shales & Sandstones		20' " 50'
Black Cr. Seam		2' " 3'+
Shales, sandstones & locally arenaceous limestone		50' " 140'
Coal		1'
Shales & Sandstones		60' " 200'
Coal		1'
Sandstones & Shales		30' " 125'
Warrior Seam: Black Band & Coal inter-changably	3" to 4'	
Shale	0 " 18'	
Coal	1'	3' 10" " 40'
Shale	3" " 17'	
Coal	2' 4"	
Fire Clay		4'

The Distances Between the Principal Coal Seams.

		Average
Pratt to Curry —	95'2" to 386'6" —	240'10"
Curry to Newcastle	27'10" " 254'2" —	141'
Newcastle to Black Cr.	171'2" " 483' —	327'1"
Black Cr. to Warrior	140' " 466' —	303'
Totals —	434'2" to 1589'8" —	1011'11"
(Including all coal seams)	446'4" to 1657'5" —	1051'10½"

419

The Coalburg Property.

I do not propose to say much at present concerning this great property, which is second to importance only to that of the Tenn. Coal and Iron Company. The sketch which I give in my published Report to the Georgia Pacific Rail Road and the full and detailed report which I made to Maj. Johnston oc in 1882, together with the large collection of facts accumulated during six years of prospecting and mining by the Company since my reports were made, seem to render it wholly unnecessary for me to undertake to give a description of this property in the present report. I will only say in general, that I have learned nothing since my first reports were made to change my opinion respecting the geological structure of the region, or the commercial value of the property. It would appear from Mr. Lutwiler's reports that the seam has

not held its own in respect to thickness, and hence is a little more costly to mine, at least in the original mining locality, than I supposed would be the case. I always knew that the Coalburg Co. were in the particulars mentioned, contending at a disadvantage with the Tennessee Coal and Iron Co. These new developments also at Blocton, and the Little Basin cast some shadow upon the older coal properties. Nevertheless there is no other coal, taking it altogether, in Alabama, equal to the Pratt coal, and it will continue to be the principal coking coal of the Birmingham region. Efforts will constantly be made it, and for a time these efforts may meet with more or less success, but they will usually be made in connection with the Black Creek and Newcastle seams, there being no other that I know of which can be thought of as competitors of the Pratt. But generally speaking the Black Creek is too thin

for profitable mining and generally speaking also, the Newcastle bed will, I suspect, be found unsuitable for coking. And if the Vanderbilt experiments have established the characteristic relations of the different seams, the Newcastle bed is 10° inferior in heating power to the Pratt. These and other considerations leave my confidence unshaken in respect to the value of the Coalburg property. Its inestimable value to the Sloss Co. is obvious. I append a communication from Mr. E. M. Tutwiler, the manager of this property, which gives information respecting the coal operations of the Company down to September, 1888.

Mr. E. M. Tutwiler's letter.

Coalburg, Ala., Sept. 1888.

Dr. W. A. Ruffner,
Lexington, Va.

My dear Sir:-

In compliance

with your letter of the 5th I herewith enclose a map of the Coalburg property also analyses of the coal and coke. We are mining now from five "drifts" or mines opening on a level with the coal at this place, and from 3 drifts at Brookside a point on the Ga. Pac. R. R. at the mouth of New Found Creek, 5 miles West of Coalburg. These mines are all self draining and the inclination of the entries and cross entries is about 1 foot in 100 feet, or sufficient to enable us to haul, with mules, about as many loaded cars as empty ones can be carried back. We mine on the post and stall system, the rooms being 40 feet wide and from 180 to 300 feet long with pillars between 24 feet wide. At the No. 4 mine at Coalburg where about 250 convicts are worked, the coal is hauled out by a wire rope arranged on the Tail rope system. This has proved very economical and satisfactory hauling out as many as 50 xxxx train cars, or about 40 tons of coal at a time. The coal at Coalburg, in-

cluding the two inches of slate is 3'2" thick and at Brookside 4'0". At present we are mining about 800 tons at Coalburg and 200 tons of coal at Brookside. About 300 tons of this is coked and the remainder sold, principally for steam purposes. When the coke ovens, now being constructed, have been completed we will coke 914 tons of coal per day at the two places.

We have now completed at Coalburg 64 Thomas ovens and 130 Bee Hives with 21 more to be finished in two weeks. At Brookside we have 50 Bee Hive ovens finished and 56 more to be completed in one month.

The Thomas oven, as you know, is 36 feet long by 7½ feet wide by 5 feet high. It is charged with 12 tons of coal which it cokes in 48 hours. The coke is drawn by machinery and emptied into the Railroad cars at about ½ the cost of the coke made in the Bee Hive ovens.

Our experience has not been

sufficient to enable us to speak positively of the merits of the Thomas oven, but thus far we believe it yields a greater percentage of coke and does not break it up into as small pieces as that from the Bee Hives. We have been operating some of the ovens since May last.

We have a cheap coal washer being a combination of the jigger and flume washer. It improved the quality of our coke very much by removing much of the slate and sulphur, but the furnace was not willing to pay us enough to remunerate us for the cost, so it was discontinued. We expect however, to use it when we begin furnishing coke to our own furnaces.

Very truly yours
E. M. Tutwiler.

P.S. Your letter of the 18th inst. just to hand. I withheld my reply to your first letter until I received some analyses from Mr. A. B. Johnston.

The total acreage of the Coalburg property is 12230 acres.

The store at Coalburg keeps a stock of about $30000 — and that at Brookside about $5000, the latter however will be increased to $15000 as soon as the mines at that point are in full operation.

We have about 130 miners houses (2, 3, 4 & 6 rooms) at Coalburg and 30 at Brookside.

Very truly,
E. M. Tutwiler.

We have ordered a plant of mining machines for Brookside consisting of 1 air compressor, air receiver and 6 Sargeant machines. These are on the principle of the Harrison and will mine about 50 tons of coal each per day.

They can be operated by unskilled labor and will produce coal cheaper than that dug by hand.

The machines can be kept in operation during strikes and this fact will do away with them.

E. M. T.

Coalburg, Ala. Oct. 6, 1888.

Dr. W. A. Ruffner
Lexington, Va.

My dear Sir:-

We commenced building bee hive ovens for the 2nd furnace at North Birmingham before the Thomas ovens had been completed. If we were to build more now I think our experience with the Thomas ovens is such that we would build them instead of the Bee Hive.

The cost of the Thomas oven is somewhat greater than that of the bee hive in mean in proportion to their yield of coke, but they are operated at one half the cost. Another great advantage is that they are operated by unskilled labor, and there is no trouble in getting them drawn even if the weather is very hot, cold or wet. Of course the machinery breaks down sometimes and causes trouble and delay, but we are having another coke drawer made so that no delays

will occur from break-downs. At first the furnace men complained of too much water in the coke, but it is now watered for the most part in the oven, and this objection is done away with. The coke is delivered in the cars in larger pieces, being handled less, and there is no loss from small coke that is left on the yard of the bee hive ovens. I regard the Thomas oven as a success, but there are yet some, even in our Company, who doubt their efficacy.

Very truly yours,
E. M. Autenrieth.
G. S. Mines.

Atlanta, Ga. Oct. 10, 1884.

Result of analyses of sample drawn by myself from a car load of the Coalburg Coal & Coke Co.'s coke & representing fairly the average of the lot.

Specific Gravity	1.88
Moisture	.16%
Vol. Inflammable matter	.34
Fixed Carbon	87.72
Ash	10.54
Sulphur	1.27

The physical properties of the coke are excellent. It is firm, well burnt and bright and will bear any charge in the furnace stack without crushing.

N. P. Pratt
Analytical Chemist.

Atlanta, Ga., Dec. 5, 1884.

Result of analyses of sample of coke sent in Nov. 20/84 by Coalburg Coal & Coke Co.

Specific Gravity	1.72
Moisture	1.00%
Vol. Comb. matter	.70
Fixed Carbon	86.20

Ash	14.00
Sulphur	2.01

N. P. Pratt
A. C.

Birmingham Ala.
Oct. 14, 1885.

Report of Coal & Coke
for
Coalburg Coal & Coke Co.

#1. Sample of coal screenings at Nos 5 & 6 from which coke is made.

Vol. matter, moisture &c	27.705%
Fixed Carbon	63.445
Ash	8.850
	100.000

Sulphur 1.606%

#2. Sample of Screened coal from Nos 5 & 6.

Vol. matter, moisture &c	24.900%
Fixed carbon	71.200
Ash	3.900
	100.000

Sulphur 1.255 } dup
1.270 } %

#3. Sample of coal screenings at 5 & 6 after being washed.

Vol. matter, moisture &c	22.820%
Fixed carbon	68.760
Ash	8.420
	100.000

Sulphur 1.625 } dup
1.668 } %

#5. Sample of coal screening at B.

Vol. matter, moisture &c	26.345%
Fixed Carbon	64.580
Ash	9.075
	100.000

Sulphur 2.118 } dup
2.143 } %

#6. Coke from washed coal.

Vol. matter, moisture &c	1.505%
Fixed Carbon	87.535
Ash	10.968
	100.000

Sulphur mean of 5 determinations 1.453%

Ash 4.400% Silica
3.990 " alumina
2.500 Oxide of Iron.

#7. Coke from unwashed coal.

Vol. matter, moisture &c	1.534 %
Fixed carbon	85.001
Ash	13.465
	100.000

Sulphur 1.723 %

	5.985 %	Silica
Ash	3.630	Alumina
	3.050	Oxide Iron

These samples were all dried at 100° & represent an average of large samples sent for analysis. It would seem that washing coal reduces the percentage of ash in the coke without removing but a small percentage of sulphur.

Alfred J. Brainerd.
A. C.

[This is the place to insert Parts III & IV.

Part V:

Furnace Properties.

This part will be extremely brief because of my failure to obtain the plats or dimensions of the furnace lots in Birmingham and North Birmingham. This omission is not important, as the information is always at hand.

I will simply give statements received from Mr. Kenneth Robertson concerning the furnaces.

* * * * * * * * * *

"There are two furnaces in the City of Birmingham which are called the Slosh Furnaces Nos 1 & 2. To these are attached 246 bee hive ovens which furnish coke for the furnaces. No. 1 Furnace is 60 feet high x 16 feet bosh and with a hearth 9 ft. diameter. Its capacity is 80 to 85 tons per day: it has three Whitwell stoves 60 ft. x 18 ft. diameter. The No. 2 Furnace

is 70 ft. x 17 ft. bosh x 10 ft. hearth and its capacity is 90 to 100 tons per day: it has three Whitwell stoves. There are five blowing engines for the two furnaces & 20 boilers.

The tracks are connected with all the RRs leading into the city.

The ores used are the soft and hard red ores in equal proportions and the mixture yields about 43% iron.

The furnaces at North Birmingham are alike each being 75 ft. high, 17 ft. bosh, 9 ft. hearth: each has four Gordon stoves, two Allis engines and four Babcock & Wilcox boilers. Their capacity is estimated at 100 tons per day. The same ores will be used: the coke will be made at Coalburg and the limestone will come from the Gate City quarries, which also furnish the Sloss furnaces."

* * * * * * * * * * *

"We have used since I have been here (with the exception

of a few weeks
1/2 Hard Gloss
1/6 Soft "
2/6 Irondale. "

* * * * * * * * * * *

"In practice it is generally the custom to allow <u>two</u> <u>equivalents</u> (not pounds) of base (lime, alumina, Magnesia &c) to one <u>equivalent</u> of Silica, with sufficient extra lime to saturate the Sulphur and form Sulphide of calcium (CaS). My recollection is that Gloss hard ore <u>will</u> flux itself and have no lime to spare."

Part VI.

Concluding Summary.

It is not necessary to repeat what is summarily stated in the "General Description of the Sloss Properties", beginning page 12.

The property is certainly great in size and in value. And it has many elements of solid worth above the surface and beneath the surface. Much of its property has an incidental value from its relations to towns and cities, to wit, the tracts in or near Birmingham, Bessemer, Gate City, Irondale and Ensley: also in its relations to railroads, which almost everywhere run through or near to Sloss tracts, thus giving value to the surface for residential, agricultural and all industrial purposes, as well as giving transportation for the heavy products of the mines and furnaces. Water power is to be had in many convenient streams, such as Gudley Creek

different branches of Warrior River, Five-Mile Cr., Valley Cr., Yellow Leaf Cr., and others: and for some purposes water power is cheapest.

The large timber interest at many points, especially in Chilton Co. (page 175 &c), and the abundance of timber everywhere for ordinary mining and other purposes, have been mentioned in connection with the several properties. And I would now add what is not elsewhere mentioned in this report, that the hard wood timber and the oak barks on the Coalburg property are exceedingly valuable. (See my Report to Maj: Johnston in 1882.)

The pomological, agricultural and horticultural features in the Sloss estate are very extensive, and will constantly increase in value. Mines, factories and cities are enormous consumers of the products of the earth: and in spite of the cheap transportation which brings in the products of richer land, distance will tell ultimately in favor

of the adjacent counties, which will first be enriched, and then will control the market.

Large areas of the Sloss territory will now produce living crops of corn and cotton. Much of it naturally clothes itself with Lespedeza and the Panic grasses, & would sod over with Bermuda if it were started.

The surface of the coal measures is generally smooth and loose, which make cheap production and make fitting land for fruits and the underground crops. The market gardners will prefer these. The limestone valley lands require only good farming to make them productive.

Limestones, sandstones and slates suited for furnace, road and building purposes are in endless supply. The climate is perfectly healthful. Water pure and abundant. The precious metals may be found in the Auronian belt.

But of course the great inter-

esto are coal and iron. The Company have large areas of both: coal for all purposes and ~~x x x~~ iron ores of good quality and of different kinds. It owns all the known workable coal seams of Alabama, and every variety of iron ore known to the country, and both in large quantities. And all lying convenient to each other and to Birmingham as a centre. The furnace plants are on the most approved modern patterns.

So that altogether the Sloss Co. property stands in the front rank of Alabama properties. It has in common with some others the best advantages for producing cheaply high grades of mill and foundry iron: and it also has certain disadvantages which are common to the iron manufacturers of the Birmingham region.

I shall not undertake to say what it costs to make iron in Birmingham or anywhere

else: for estimates are one thing and actualities are another. But an assemblage of advantages belong to the Birmingham region that cannot be found elsewhere that I know of: to wit, the close proximity to each other of all the materials of iron making, and all of good quality and in large quantity: cheap labor, mild and healthful climate, cheap material for building and living, and competing lines of railroads in every direction. To these may be added proximity to a fresh and rapidly growing market in the N.W., W., S.W., and S., which market will be immensely increased by connecting the Gulf of Mexico with the Pacific Ocean. The Sloss Co. have all the facilities for making iron within itself, and in surplus quantities, and in this respect are not equalled by more than one company in Alabama.

It should be noted however that the Alabama iron makers

have to contend with certain disadvantages, to wit:

1. Distance from deep water, and from the Northern and Eastern market: which however is somewhat compensated for by a more favored position in reference to foreign iron.

2. The comparatively lean, cold, short and silicious character of a large proportion of her chief ore beds. Much of the ore would stand well anywhere, and as a whole it averages with the Pennsylvania ores: but the fact remains that taking the entire lines of Clinton ore only a small proportion comparatively will make good furnace ore, as matters now stand. Of course the time is coming when the phosphorus will be taken out economically: and it is not unlikely that some day the silica will be dissolved out more cheaply than it can be melted out. But at present the silica and the phosphorus present serious difficulties.

The brown ores are generally high in iron and low in silica: but in a few years the local supply of brown ore will be brought low. The dependence for the future must be chiefly on the Clinton Red Ores, and they must be bought in thin beds, or else worked with an increasing proportion of lime or silica.

The prospect is, that in a few years Alabama must take up seriously this matter of ore supply just as Pennsylvania has been compelled to do. In one respect the problem has similar conditions in the two states, viz. the fuel supply is better than the supply of satisfactory ore: and the remedy is the same for both, namely; more good ore. Either purifying the ores we have by dephosphorizing and if possible by desilicizing them, or else import ores in whole or part.

Pennsylvania has adopted the latter method, and is importing ores from Lake Superior,

Iron Mountain, Missouri, and from foreign lands.

Alabama may be too far from Lake Superior: but is not too far from Iron Mountain: and there are prospects of new and large ore developments beyond the Mississippi River and also in Mexico.

But few of our Alabama men seem to have studied the economy of using rich neutral ores even at a high price. This economy runs through every part of the iron making process and is worthy of earnest study.

Another disadvantage will require time to overcome, namely, the lack of system, and of close economy of time, labor and money, which can be corrected only by long experience, and the creation of a large class of mining and manufacturing experts. Considering how rapidly the iron business has expanded in the United States and especially in Alabama it is amazing to witness the degree of success

which has already been attained: but on this line there needs to be constant study and pressure. This counsel is not specially needed in the Sloss Co. at present.

There is another point which needs always to be considered, namely, whether it is wise in the Alabama iron makers to work up the best of their ores without reference to the future, or to work as large an admixture as possible of the rougher ores with the smoother. The policy must be largely controlled by the price of iron. Furnaces must pay expenses, but in good times when profits are large, would it not be better to increase proportionally the mixture of inferior ores. If, for example, the price of iron will justify the working of 35 to 40 per cent ores, and the ore supply of a furnace consists of 1,000,000 tons of 55% ore, and 20,000,000 tons of 35% ore

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