ANALYSES OF COAL SAMPLES FROM VARIOUS FIELDS IN THE UNITED STATES.

By MARIUS R. CAMPBELL.

INTRODUCTION.

The accompanying table gives the analysis of all coal samples collected by the United States Geological Survey during the year 1913. The analyses were made at the Pittsburgh laboratory of the Bureau of Mines by the same methods as those employed in all previous work by that bureau and by the Geological Survey, and consequently the results are comparable in every way with those already published by the two organizations.

In the course of a year many coal fields are examined in detail or reconnaissance by members of the United States Geological Survey. Those fields located in the eastern part of the United States are surveyed for the purpose of determining the amount and quality of the coal contained in them and of making public the facts concerning them in order to assist in their development. In the public-land States of the West the examinations are made in part for a similar purpose, but also (and in late years this has come to be the controlling motive) to gather data for the classification of the land as mineral or nonmineral according to its coal content. If the land is classed as coal land a valuation must be assigned it in accordance with certain rules and regulations adopted by the Interior Department, which take into account the amount of the coal and also its quality. The amount of the coal is determined from field data which are sufficiently complete for making a fairly reliable tonnage estimate; the quality of the coal is determined largely by chemical analysis. In determining the quality it is necessary to have not only the ordinary chemical analysis but also calorimeter determinations of the heating value. The analyses here given, as well as those previously published by the Bureau of Mines and the Geological Survey, generally give both of these factors for determining the value of a coal and afford a reliable basis for the valuation of the public land. In addition they present a vast amount of information by which almost any coal in the United States may be compared with others to determine its relative value for commercial uses.

Most of these analyses will be published in the descriptions of the fields to which they pertain, but as such reports will necessarily be delayed until all the data gathered in the field have been thoroughly classified and digested, they may not appear for several months or even a year. In order, however, to make the analyses immediately available to the public, they have been grouped according to States and counties and are herewith published in advance of the reports to which they relate. As a result of this mode of publication it is impossible to discuss and compare the analyses in order to show the relative grades of the coal samples, but it is believed that from the description of the samples that is given those wishing to make such comparisons can do so and can determine for themselves the relative efficiencies of the particular coals in which they are interested. This use is believed to be sufficiently great to justify the publication of the analyses in advance of the report on the field in which the samples were collected.

Many of the samples, especially those from public-land States, were collected in fields in which mining either has not been begun or has attained only negligible development. In these fields it is difficult, if not impossible, to secure fresh material, and hence the analyses show the coal to be of a lower grade than would appear were the sample made up of strictly unweathered coal. In the table all the weathered samples that have been recognized as such are marked. Their analyses should be taken with considerable allowance, and no important comparisons should be made with them or developments of the coal bed undertaken until they have been checked by the analysis of freshly mined coal. The analysis of weathered coal is valuable only until it can be supplanted by more reliable results.

In taking a sample of coal for analysis the geologist is instructed to make every endeavor to procure fresh unweathered material. He is supposed to face up the bed in the mine or prospect until fresh material is available, and then to obtain his sample by making a uniform cut across the bed from roof to floor, including all such benches and partings as an experienced and careful miner would include in commercial coal and throwing out such impurities as would certainly be excluded in practical operation. He is supposed to cut sufficient coal to give at least 6 pounds to the foot of coal bed sampled. The sample is hastily pulverized in the mine until it will pass through a ½-inch mesh and then is quartered down until about 4 pounds remain. This sample is placed in a galvanized-iron can, sealed with adhesive tape or paraffin, and mailed to the laboratory for analysis. The sampling is done on the principle that a coal mine should be sampled as carefully as a gold mine and that the sample should be even more carefully handled after it has been taken. The object of sealing is to prevent change in the moisture content, so that the coal may reach the

laboratory in practically the same condition in which it exists in the mine. Coal is a very unstable substance, and great care must be exercised to prevent oxidation in the course of preparation and in transit. It is also important that the sample should consist of neither the best nor the poorest coal, but that it should be representative of the output of the mine, if one is in operation, or, if the field is undeveloped, it should represent as nearly as possible the merchantable coal that may be secured at some time in the future when mining is carried on.

Although the aim of the geologist in obtaining a sample by the method specified above is to obtain coal that is representative of the output of the mine, practical experience has shown that this is seldom or never accomplished. Almost invariably the sample obtained in the mine contains a lower percentage of impurities than does the coal which reaches the consumer. This is largely due to carelessness in mining and handling and probably could be largely eliminated were the conditions of mining more nearly ideal. By comparing a large number of samples taken in a mine with those taken at the point of consumption it has been found that there is a fairly constant though small difference in the percentage of moisture, ash, and sulphur, and that almost invariably the amount of these substances in the mine sample is less than it is in the coal as it reaches the market. For this reason a small amount should be added, especially to the ash given in the accompanying table, to correctly represent the ash in merchantable coal from the same mine.

During the early stages of land classification all the analytical work was done by the Geological Survey, but with the establishment of the Bureau of Mines "the analyzing and testing of coals, lignites, and other mineral-fuel substances" of the United States passed by law to that bureau. Accordingly all the analyses listed in this paper were made at the Bureau of Mines and to that bureau should be given the responsibility and credit. Although the analytical work has passed from one bureau to another, the laboratory and many of the chemists engaged in the work have remained the same and consequently the results are strictly comparable.

In the table the analyses are given in four forms, marked A, B, C, and D. Analysis A represents the sample as it comes from the mine. This form is not well suited for comparing one coal with another in order to determine their relative merits as a fuel because the amount of moisture in the sample as it comes from the mine is largely a matter of accident, and consequently analyses of the same coal expressed in this form may vary as widely as the analyses of coal from different beds or from different fields. Analysis B represents the sample after it has been dried at a temperature a little above the normal until its weight becomes constant. This form of analysis probably represents the coal in its most stable condition

and one approaching most closely its condition as it reaches the market. Therefore it is the form best adapted to the general purposes of comparison. Analysis C represents the theoretical condition of the coal after all the moisture has been eliminated. Analysis D represents the coal after all moisture and ash have been theoretically removed. This is supposed to represent the true coal substance, free from the most significant impurities. Forms C and D are obtained from the others merely by recalculation. They are useful in a study of the pure coal substance, free from impurity, but as this substance is not the same as the coal that reaches the bin of the consumer neither form C nor form D should be used in practical work.

In the analytical work it is not possible to determine the proximate constituents of coal or lignite with the same degree of accuracy as the ultimate constituents. Therefore the air-drying loss, moisture, volatile matter, fixed carbon, and ash are given to one decimal place only; whereas the ash (in the ultimate analysis), sulphur, hydrogen, carbon, nitrogen, and oxygen are given to two decimal places. The determination of the calorific value to individual units is not reliable, hence in the column headed "Calories" the values are given to the nearest five units and in the column headed "British thermal units" they are given to the nearest tens, as the value of a British thermal unit is about one-half that of a calorie.

CLASSIFICATION OF COAL.

The classification of coal into various grades, such as bituminous, semibituminous, and lignite, is arbitrary and not at all satisfactory, but it is in common use in the United States and it seems desirable to give the class for each sample, because from the analysis one could not always determine this important point. The classes generally used in the United States are as follows: Anthracite, semianthracite, semibituminous, bituminous, subbituminous, and lignite.

Anthracite.—Anthracite coal is generally well known, but in a systematic classification it is generally defined as a hard coal having a fuel ratio (fixed carbon divided by volatile matter) of not less than 10. Most of this coal comes from the anthracite fields of eastern Pennsylvania, but small areas are known in some of the Western States where the coal has been changed to anthracite by the heat and pressure of masses of igneous rock.

Semianthracite.—Semianthracite coal has a fuel ratio ranging from 6 or 7 to 10. There is only a small amount of this coal in the United States, found in local basins or in close proximity to igneous rocks.

Semibituminous.—Semibituminous coal is of great commercial importance, but is not widely distributed. Its fuel ratio ranges from

3 to 6 or 7. It is the best steam coal in the country, and some of it can be utilized in the manufacture of coke. The centers of production are the Pocahontas and New River fields of Virginia and West Virginia, Georges Creek field of Maryland, Windber field of Pennsylvania, and the western end of the Arkansas field in the vicinity of Fort Smith. Though small areas containing this grade of coal have been found in Washington and Colorado, the amount of such coal in these fields is small.

Bituminous.—Bituminous coal is the most important grade in the country and includes most of the coals east of the Rocky Mountains. In the Western States there are large areas of bituminous coal, such as the Trinidad-Raton field of Colorado and New Mexico; the Grand Hogback field of Colorado; the Book Cliffs field of Utah; the Rock Springs, Kemmerer, and Black Hills fields of Wyoming; the Great Falls field of Montana; and many districts of Washington. This grade furnishes most of the coking coal of the country, and it is largely sold for steam raising and for domestic use.

Subbituminous.—The term "subbituminous" has been adopted by the Geological Survey for what has generally been called "black lignite." The latter term is objectionable, for the reason that the coal is not lignitic in the sense of being woody, and the use of the term seems to imply that the coal is little better than the brown, woody lignite of North Dakota, whereas many of the coals of this class closely approach the lowest grade of bituminous coal. In fact, it is extremely difficult to separate this class from the one below and the one above. It is generally distinguished from the lignite by its color and freedom from apparent woody texture and from bituminous coal by the slacking it undergoes when exposed to the weather. As the latter is an important difference in commercial use, it has been adopted by the Geological Survey as the criterion for the separation of subbituminous and bituminous coals.

Subbituminous coal is found in most of the western fields, being well known in the field about Boulder and Denver and in North Park, Colo.; Gallup, N. Mex.; Hanna, Douglas, Sheridan, and the Bighorn Basin, Wyo.; Red Lodge and Musselshell, Mont.; and in many of the districts of Washington and Oregon.

Lignite.—As used by the Geological Survey the term "lignite" is restricted to the coals that are distinctly brown and generally woody. They are intermediate in quality between peat and subbituminous coal. Lignite is abundant in the North in eastern Montana and North Dakota and in the northwest corner of South Dakota. In the South it is present in all of the Gulf States, but it has been developed commercially only in Texas.

ANALYSES.[a]

[Made by the Bureau of Mines. A. C. Fieldner, chemist in charge.]

ALABAMA.

DEKALB COUNTY.

Laboratory No.	Air-drying loss.	Form of analysis.	Proximate.				Ultimate.					Heating value.	
			Moisture.	Volatile matter.	Fixed carbon.	Ash.	Sulphur.	Hydrogen.	Carbon.	Nitrogen.	Oxygen.	Calories.	British thermal units.
18230	2.6	A	3.6	19.0	65.9	11.5	1.44						
		B	1.1	19.5	67.6	11.8	1.48						
		C		19.7	68.4	11.9	1.49						
		D		22.4	77.6		1.69						
18233	2.8	A	3.4	18.7	63.4	14.54	1.22	4.29	72.86	1.27	5.82	7,055	12,700
		B	.6	19.2	65.2	14.95	1.25	4.09	74.92	1.31	3.48	7,255	13,060
		C		19.3	65.6	15.05	1.26	4.05	75.41	1.31	2.92	7,305	13,150
		D		22.7	77.3		1.48	4.77	88.77	1.54	3.44	8,595	15,480
18234	2.9	A	3.8	19.0	64.4	12.8	1.52					7,215	12,980
		B	1.0	19.6	66.3	13.1	1.56					7,425	13,370
		C		19.7	67.0	13.3	1.58					7,500	13,500
		D		22.8	77.2		1.82					8,645	15,560
18231	2.2	A	2.8	20.2	60.6	16.4	4.43						
		B	.6	20.7	62.0	16.7	4.53						
		C		20.8	62.4	16.8	4.56						
		D		25.0	75.0		5.48						
18232	3.0	A	3.5	20.6	64.8	11.1	2.64						
		B	.5	21.3	66.8	11.4	2.72						
		C		21.3	67.2	11.5	2.74						
		D		24.1	75.9		3.09						

COLORADO.

LA PLATA COUNTY.

17745F	1.3	A	4.7	36.8	45.0	13.52	0.86	5.47	66.56	1.51	12.08	6,640	11,950
		B	3.4	37.3	45.6	13.70	.87	5.39	67.46	1.53	11.05	6,730	12,110
		C		38.6	47.2	14.18	.90	5.19	69.81	1.58	8.34	6,965	12,540
		D		45.0	55.0		1.05	6.05	81.34	1.84	9.72	8,115	14,610
17747	1.4	A	11.6	31.4	40.1	16.9	.61					4,615	8,300
		B	10.3	31.8	40.7	17.2	.62					4,680	8,420
		C		35.5	45.4	19.1	.69					5,220	9,400
		D		43.9	56.1		.85					6,455	11,620
17748	.7	A	4.2	36.1	44.6	15.1	.69					6,500	11,700
		B	3.6	36.4	44.8	15.2	.69					6,545	11,780
		C		37.7	46.5	15.8	.72					6,890	12,220
		D		44.8	55.2		.85					8,055	14,500
17855	2.5	A	5.8	37.2	50.3	6.71	.58	5.67	71.41	1.61	14.02	7,025	12,650
		B	3.3	38.2	51.6	6.88	.59	5.53	73.27	1.65	12.08	7,210	12,980
		C		39.5	53.4	7.12	.62	5.34	75.81	1.71	9.40	7,460	13,430
		D		42.5	57.5		.67	5.75	81.62	1.84	10.12	8,030	14,460

[a] Description of samples is given on pp. 508-526.

COLORADO—Continued.

MOFFAT COUNTY.

Laboratory No.	Air-drying loss.	Form of analysis.	Proximate.			Ultimate.						Heating value.	
			Moisture.	Volatile matter.	Fixed carbon.	Ash.	Sulphur.	Hydrogen.	Carbon.	Nitrogen.	Oxygen.	Calories.	British thermal units.
17592	7.8	A	23.3	[a] 29.6	40.0	7.13	0.65	5.79	54.00	0.68	31.75	4,925	8,870
		B	16.8	32.1	43.4	7.73	.70	5.35	58.55	.74	26.93	5,340	9,610
		C	.....	38.6	52.1	9.29	.85	4.18	70.37	.89	14.42	6,420	11,550
		D	.....	42.5	57.5	.....	.94	4.61	77.58	.98	15.89	7,075	12,740
17593	5.1	A	22.1	[a] 31.6	42.0	4.34	.72	6.01	55.39	1.18	32.36	5,165	9,300
		B	17.9	33.3	44.2	4.57	.76	5.73	58.37	1.24	29.33	5,445	9,800
		C	.....	40.6	53.8	5.57	.92	4.56	71.10	1.51	16.34	6,630	11,930
		D	.....	43.0	57.0	.....	.97	4.83	75.29	1.60	17.31	7,020	12,640
17686	[b] 2.4	A	11.7	38.0	44.3	5.96	.92	5.84	63.99	1.14	22.15	6,210	11,180
		B	9.6	38.9	45.4	6.10	.94	5.71	65.54	1.17	20.54	6,360	11,450
		C	.....	43.0	50.2	6.75	1.04	5.14	72.48	1.29	13.30	7,035	12,670
		D	.....	46.2	53.8	.....	1.12	5.51	77.73	1.38	14.26	7,545	13,580
17696	6.1	A	18.9	[a] 30.4	44.4	6.29	.64	5.71	57.47	.82	29.07	5,400	9,720
		B	13.6	32.4	47.3	6.70	.68	5.36	61.22	.87	25.17	5,755	10,360
		C	.....	37.5	54.7	7.76	.79	4.45	70.90	1.01	15.09	6,665	11,990
		D	.....	40.7	59.3	.....	.86	4.82	76.86	1.09	16.37	7,225	13,000
17782	[b] 1.8	A	11.9	36.8	45.6	5.72	.55	5.83	64.36	1.40	22.14	6,240	11,230
		B	10.2	37.5	46.5	5.83	.56	5.73	65.56	1.43	20.89	6,355	11,440
		C	.....	41.7	51.8	6.49	.62	5.12	73.03	1.59	13.15	7,080	12,750
		D	.....	44.6	55.4	.....	.66	5.48	78.10	1.70	14.06	7,575	13,630
17840	[b] 2.2	A	14.2	36.3	45.3	4.18	.59	5.82	63.54	1.22	24.65	6,100	10,980
		B	12.2	37.1	46.4	4.28	.60	5.70	64.98	1.25	23.19	6,235	11,230
		C	.....	42.2	52.9	4.87	.69	4.94	74.06	1.42	14.02	7,105	12,790
		D	.....	44.4	55.6	.....	.73	5.19	77.85	1.49	14.74	7,470	13,450

ILLINOIS.

McDONOUGH COUNTY.

15119	10.1	A	13.3	37.7	42.6	6.41	2.88	5.91	63.84	1.20	19.76	6,495	11,700
		B	3.5	42.0	47.4	7.13	3.20	5.33	71.01	1.34	11.99	7,225	13,010
		C	.....	43.5	49.1	7.39	3.32	5.11	73.61	1.38	9.19	7,490	13,490
		D	.....	47.0	53.0	.....	3.58	5.52	79.48	1.49	9.93	8,090	14,560

KENTUCKY.

PIKE COUNTY.

17459F	1.4	A	3.2	33.0	58.7	5.08	0.62	5.33	78.45	1.40	9.12	7,710	13,880
		B	1.9	33.5	59.5	5.15	.63	5.25	79.53	1.42	8.02	7,815	14,070
		C	.....	34.1	60.6	5.25	.64	5.14	81.05	1.45	6.47	7,965	14,340
		D	.....	36.0	64.0	.....	.68	5.42	85.54	1.53	6.83	8,410	15,130
17460F	1.0	A	2.5	34.8	58.4	4.26	.59	5.22	79.89	1.45	8.59	7,915	14,250
		B	1.5	35.2	59.0	4.30	.60	5.16	80.69	1.46	7.79	7,995	14,390
		C	.....	35.7	59.9	4.37	.61	5.07	81.94	1.49	6.52	8,115	14,610
		D	.....	37.4	62.6	.....	.64	5.30	85.68	1.56	6.82	8,490	15,280
17461F	1.3	A	2.8	36.2	56.7	4.30	1.35	5.39	79.25	1.47	8.24	7,875	14,180
		B	1.5	36.7	57.4	4.35	1.37	5.32	80.25	1.49	7.22	7,975	14,360
		C	.....	37.2	58.4	4.42	1.39	5.22	81.50	1.51	5.96	8,100	14,580
		D	.....	39.0	61.0	.....	1.45	5.46	85.27	1.58	6.24	8,475	15,260

[a] Volatile matter determined by the modified official method. (See Bureau of Mines Bull. 22, p. 29.)
[b] The small air-drying loss indicates that the coal was weathered.

MONTANA.

BIGHORN COUNTY.

Laboratory No.	Air-drying loss.	Form of analysis.	Proximate.				Ultimate.					Heating value.	
			Moisture.	Volatile matter.	Fixed carbon.	Ash.	Sulphur.	Hydrogen.	Carbon.	Nitrogen.	Oxygen.	Calories.	British thermal units.
17711	3.7	A	22.6	31.9	39.5	6.0	0.51	.....	.....	.....	.....	4,895	8,810
		B	19.6	33.1	41.1	6.2	.53	.....	.....	.....	.....	5,085	9,150
		C	.....	41.2	51.1	7.7	.66	.....	.....	.....	.....	6,325	11,380
		D	.....	44.6	55.4	.....	.72	.....	.....	.....	.....	6,855	12,340

HILL COUNTY.

17841F	10.1	A	24.1	[a] 29.2	37.4	9.28	1.15	5.98	50.03	1.02	32.54	4,705	8,470
		B	15.7	32.5	41.5	10.32	1.28	5.40	55.63	1.13	26.24	5,230	9,420
		C	.....	38.5	49.3	12.23	1.52	4.35	65.95	1.34	14.61	6,205	11,170
		D	.....	43.9	56.1	.....	1.73	4.96	75.14	1.53	16.64	7,065	12,720
17842F	1.2	A	7.2	34.0	50.5	8.33	1.77	5.13	67.62	1.42	15.73	6,540	11,770
		B	6.0	34.4	51.2	8.43	1.79	5.06	68.45	1.44	14.83	6,620	11,920
		C	.....	36.6	54.4	8.97	1.91	4.66	72.84	1.53	10.09	7,045	12,680
		D	.....	40.2	59.8	.....	2.10	5.12	80.01	1.68	11.09	7,740	13,930
17892	19.1	A	31.4	[a] 30.4	23.8	14.4	1.35	.....	.....	.....	.....	.....	.....
		B	15.2	37.6	29.4	17.8	1.67	.....	.....	.....	.....	.....	.....
		C	.....	44.4	34.7	20.9	1.97	.....	.....	.....	.....	.....	.....
		D	.....	56.2	43.8	.....	2.49	.....	.....	.....	.....	.....	.....

MUSSELSHELL COUNTY.

17586F	2.2	A	13.4	32.4	47.6	6.58	0.39	5.59	63.89	0.98	22.57	6,175	11,120
		B	11.5	33.1	48.7	6.73	.40	5.46	65.34	1.00	21.07	6,315	11,370
		C	.....	37.4	55.0	7.60	.45	4.74	73.79	1.13	12.29	7,130	12,840
		D	.....	40.4	59.6	.....	.49	5.13	79.86	1.22	13.30	7,720	13,890
17587	3.4	A	14.5	31.5	47.5	6.5	.80	.....	.....	.....	.....	5,750	10,350
		B	11.6	32.6	49.1	6.7	.83	.....	.....	.....	.....	5,950	10,710
		C	.....	36.9	55.5	7.6	.94	.....	.....	.....	.....	6,725	12,110
		D	.....	39.9	60.1	.....	1.02	.....	.....	.....	.....	7,280	13,100
17588	2.1	A	13.6	32.6	46.8	7.0	.58	.....	.....	.....	.....	6,105	10,990
		B	11.7	33.3	47.8	7.2	.59	.....	.....	.....	.....	6,235	11,220
		C	.....	37.7	54.1	8.2	.67	.....	.....	.....	.....	7,065	12,710
		D	.....	41.1	58.9	.....	.73	.....	.....	.....	.....	7,690	13,840
17589	2.0	A	13.4	33.2	45.6	7.8	.51	.....	.....	.....	.....	6,050	10,890
		B	11.7	33.9	46.5	7.9	.52	.....	.....	.....	.....	6,175	11,120
		C	.....	38.3	52.7	9.0	.59	.....	.....	.....	.....	6,990	12,590
		D	.....	42.1	57.9	.....	.65	.....	.....	.....	.....	7,685	13,830

NEW MEXICO.

COLFAX COUNTY.

17703	0.9	A	2.6	36.0	45.3	16.08	0.56	5.35	67.63	1.56	8.82	6,750	12,150
		B	1.7	36.4	45.7	16.23	.57	5.30	68.25	1.57	8.08	6,810	12,260
		C	.....	37.0	46.5	16.51	.57	5.19	69.43	1.60	6.70	6,930	12,470
		D	.....	44.3	55.7	.....	.68	6.22	83.16	1.92	8.02	8,300	14,940
17746F	1.6	A	5.7	37.4	44.6	12.28	1.09	5.47	66.31	1.40	13.45	6,655	11,980
		B	4.1	38.0	45.4	12.48	1.11	5.38	67.41	1.42	12.20	6,765	12,180
		C	.....	39.6	47.4	13.02	1.16	5.13	70.33	1.48	8.88	7,055	12,700
		D	.....	45.6	54.4	.....	1.33	5.90	80.86	1.70	10.21	8,115	14,600
17781F	.4	A	2.0	35.7	49.2	13.10	.78	5.24	70.71	1.32	8.85	7,035	12,670
		B	1.6	35.9	49.4	13.15	.78	5.22	70.99	1.33	8.53	7,065	12,720
		C	.....	36.4	50.2	13.36	.80	5.12	72.13	1.35	7.24	7,180	12,920
		D	.....	42.1	57.9	.....	.92	5.91	83.25	1.56	8.36	8,285	14,910

[a] Volatile matter determined by the modified official method.

NEW MEXICO—Continued.

SAN JUAN COUNTY.

Laboratory No.	Air-drying loss.	Form of analysis.	Proximate.				Ultimate.					Heating value.	
			Moisture.	Volatile matter.	Fixed carbon.	Ash.	Sulphur.	Hydrogen.	Carbon.	Nitrogen.	Oxygen.	Calories.	British thermal units.
17749	1.6	A	6.6	35.4	44.9	13.1	0.66	.....	.....	.....	.....	6,380	11,490
		B	5.1	36.0	45.6	13.3	.67	.....	.....	.....	.....	6,485	11,680
		C	.....	37.9	48.0	14.1	.71	.....	.....	.....	.....	6,835	12,300
		D	.....	44.1	55.9	.....	.83	.....	.....	.....	.....	7,950	14,310
17750	1.8	A	10.6	36.7	49.6	3.1	.64	.....	.....	.....	.....	6,115	11,010
		B	9.0	37.4	50.5	3.1	.65	.....	.....	.....	.....	6,225	11,210
		C	.....	41.1	55.4	3.5	.72	.....	.....	.....	.....	6,840	12,310
		D	.....	42.6	57.4	.....	.75	.....	.....	.....	.....	7,085	12,750

SOCORRO COUNTY.

17602	1.3	A	6.5	34.5	51.9	7.09	0.50	5.32	69.35	1.17	16.57	6,660	11,990
		B	5.3	34.9	52.6	7.18	.51	5.25	70.24	1.19	15.63	6,750	12,150
		C	.....	36.9	55.5	7.58	.53	4.92	74.16	1.25	11.56	7,125	12,820
		D	.....	39.9	60.1	.....	.57	5.32	80.24	1.35	12.52	7,710	13,870
17728	6.7	A	18.5	[a]31.7	39.0	10.8	.43	.....	.....	.....	.....	4,710	8,480
		B	12.6	34.0	41.8	11.6	.46	.....	.....	.....	.....	5,050	9,090
		C	.....	38.9	47.9	13.2	.53	.....	.....	.....	.....	5,780	10,400
		D	.....	44.8	55.2	.....	.61	.....	.....	.....	.....	6,665	11,990

OREGON.

GRANT COUNTY.

18125	27.4	A	34.7	[a]20.0	14.2	31.1	1.41	.....	.....	.....	.....	.....	.....
		B	10.1	27.6	19.5	42.8	1.94	.....	.....	.....	.....	.....	.....
		C	.....	30.6	21.7	47.7	2.16	.....	.....	.....	.....	.....	.....
		D	.....	58.5	41.5	.....	4.13	.....	.....	.....	.....	.....	.....

WHEELER COUNTY.

18126	7.2	A	13.8	22.8	29.2	34.2	0.47	.....	.....	.....	.....	.....	.....
		B	7.1	24.6	31.5	36.8	.51	.....	.....	.....	.....	.....	.....
		C	.....	26.5	33.9	39.6	.55	.....	.....	.....	.....	.....	.....
		D	.....	43.9	56.1	.....	.91	.....	.....	.....	.....	.....	.....
18127	6.6	A	13.4	23.7	32.1	30.8	.46	.....	.....	.....	.....	4,040	7,270
		B	7.3	25.4	34.3	33.0	.49	.....	.....	.....	.....	4,320	7,780
		C	.....	27.4	37.0	35.6	.53	.....	.....	.....	.....	4,665	8,390
		D	.....	42.5	57.5	.....	.82	.....	.....	.....	.....	7,235	13,030

PENNSYLVANIA.

CENTER COUNTY.

17444F	2.1	A	3.4	22.8	61.4	12.40	0.88	4.69	74.44	1.45	6.14	7,245	13,040
		B	1.3	23.3	62.7	12.67	.90	4.55	76.07	1.48	4.33	7,400	13,320
		C	.....	23.6	63.6	12.83	.91	4.46	77.05	1.50	3.25	7,500	13,500
		D	.....	27.1	72.9	.....	1.04	5.12	88.39	1.72	3.73	8,600	15,480
17445	2.2	A	3.5	22.1	66.6	7.8	1.79	.....	.....	.....	.....	7,700	13,860
		B	1.4	22.5	68.1	8.0	1.83	.....	.....	.....	.....	7,875	14,170
		C	.....	22.9	69.0	8.1	1.86	.....	.....	.....	.....	7,980	14,370
		D	.....	24.9	75.1	.....	2.02	.....	.....	.....	.....	8,685	15,630
17446F	2.1	A	3.5	23.7	61.6	11.24	2.66	4.78	73.51	1.34	6.47	7,255	13,060
		B	1.4	24.2	62.9	11.48	2.72	4.64	75.11	1.37	4.68	7,415	13,340
		C	.....	24.6	63.8	11.64	2.75	4.56	76.13	1.39	3.53	7,515	13,530
		D	.....	27.8	72.2	.....	3.11	5.16	86.16	1.57	4.00	8,505	15,310
17447F	1.2	A	1.9	22.0	61.5	14.57	.99	4.43	73.26	1.26	5.49	7,095	12,780
		B	.6	22.3	62.3	14.75	1.00	4.34	74.18	1.28	4.45	7,185	12,940
		C	.....	22.4	62.7	14.85	1.01	4.30	74.67	1.28	3.89	7,235	13,020
		D	.....	26.3	73.7	.....	1.19	5.05	87.69	1.50	4.57	8,495	15,290

[a] Volatile matter determined by the modified official method.

PENNSYLVANIA—Continued.

CLEARFIELD COUNTY.

Laboratory No.	Air-drying loss.	Form of analysis.	Proximate.				Ultimate.					Heating value.	
			Moisture.	Volatile matter.	Fixed carbon.	Ash.	Sulphur.	Hydrogen.	Carbon.	Nitrogen.	Oxygen.	Calories.	British thermal units.
17441F	1.4	A	2.4	22.4	66.4	8.75	3.15	4.71	78.05	1.36	3.98	7,660	13,790
		B	1.1	22.7	67.3	8.87	3.19	4.62	79.14	1.38	2.80	7,770	13,980
		C	.....	23.0	68.0	8.97	3.23	4.55	80.01	1.39	1.85	7,855	14,140
		D	.....	25.2	74.8	.....	3.55	5.00	87.89	1.53	2.03	8,625	15,530
17442F	1.9	A	2.8	20.2	63.9	13.10	3.04	4.66	72.98	1.27	4.95	7,215	12,990
		B	.9	20.6	65.1	13.35	3.10	4.54	74.40	1.29	3.32	7,355	13,240
		C	.....	20.8	65.7	13.48	3.13	4.48	75.10	1.31	2.50	7,425	13,370
		D	.....	24.0	76.0	.....	3.62	5.18	86.80	1.51	2.89	8,580	15,450
17443F	1.0	A	2.0	31.1	58.3	8.65	2.01	5.04	76.99	1.60	5.71	7,630	13,730
		B	1.0	31.4	58.9	8.73	2.03	4.98	77.73	1.62	4.91	7,705	13,870
		C	.....	31.7	59.5	8.82	2.05	4.92	78.54	1.63	4.04	7,785	14,010
		D	.....	34.8	65.2	.....	2.25	5.40	86.13	1.79	4.43	8,535	15,370

ELK COUNTY.

17455	1.5	A	2.9	34.7	52.7	9.66	3.92	5.19	72.67	1.41	7.15	7,380	13,280
		B	1.5	35.2	53.5	9.80	3.98	5.10	73.75	1.43	5.94	7,490	13,480
		C	.....	35.7	54.3	9.95	4.04	5.02	74.86	1.45	4.68	7,600	13,680
		D	.....	39.6	60.4	.....	4.49	5.57	83.13	1.61	5.20	8,440	15,200
17456F	1.3	A	2.7	32.4	58.6	6.32	2.52	5.22	78.10	1.45	6.39	7,785	14,020
		B	1.5	32.8	59.3	6.40	2.55	5.14	79.10	1.47	5.34	7,885	14,200
		C	.....	33.3	60.2	6.49	2.59	5.06	80.26	1.49	4.11	8,000	14,400
		D	.....	35.6	64.4	.....	2.77	5.41	85.83	1.59	4.40	8,555	15,400
17457	1.8	A	3.1	30.6	57.0	9.3	3.45	.....	.....	.....	.....	7,440	13,390
		B	1.4	31.1	58.0	9.5	3.51	.....	.....	.....	.....	7,570	13,630
		C	.....	31.5	58.8	9.7	3.56	.....	.....	.....	.....	7,675	13,820
		D	.....	34.9	65.1	.....	3.94	.....	.....	.....	.....	8,495	15,300
17458	1.0	A	2.7	33.7	54.9	8.7	2.89	.....	.....	.....	.....	7,480	13,470
		B	1.7	34.0	55.5	8.8	2.92	.....	.....	.....	.....	7,560	13,600
		C	.....	34.6	56.5	8.9	2.97	.....	.....	.....	.....	7,690	13,840
		D	.....	38.0	62.0	.....	3.26	.....	.....	.....	.....	8,440	15,190

JEFFERSON COUNTY.

17448F	1.2	A	1.9	34.6	53.2	10.28	2.91	5.00	72.73	1.51	7.57	7,305	13,150
		B	.7	35.0	53.9	10.40	2.95	4.93	73.61	1.53	6.58	7,395	13,310
		C	.....	35.3	54.2	10.48	2.97	4.88	74.11	1.54	6.02	7,445	13,400
		D	.....	39.4	60.6	.....	3.32	5.45	82.79	1.72	6.72	8,315	14,970
17449F	1.2	A	3.1	32.3	54.9	9.67	1.69	4.99	73.71	1.60	8.34	7,345	13,220
		B	1.9	32.7	55.6	9.78	1.71	4.92	74.58	1.62	7.39	7,430	13,370
		C	.....	33.3	56.7	9.98	1.74	4.80	76.07	1.65	5.76	7,580	13,640
		D	.....	37.0	63.0	.....	1.93	5.33	84.51	1.83	6.40	8,420	15,150
17450F	.5	A	1.9	34.5	53.2	10.40	3.38	5.03	74.08	1.51	5.60	7,385	13,290
		B	1.4	34.7	53.5	10.45	3.40	5.00	74.46	1.52	5.17	7,425	13,360
		C	.....	35.2	54.2	10.60	3.45	4.91	75.54	1.54	3.96	7,530	13,550
		D	.....	39.3	60.7	.....	3.86	5.49	84.50	1.72	4.43	8,425	15,160

PENNSYLVANIA—Continued.

SOMERSET COUNTY.

Laboratory No.	Air-drying loss.	Form of analysis.	Proximate.				Ultimate.					Heating value.	
			Moisture.	Volatile matter.	Fixed carbon.	Ash.	Sulphur.	Hydrogen.	Carbon.	Nitrogen.	Oxygen.	Calories.	British thermal units.
17689	2.9	A	4.2	19.8	63.9	12.12	0.67	4.70	74.31	1.27	6.93	7,175	12,920
		B	1.3	20.4	65.8	12.48	.69	4.51	76.51	1.31	4.50	7,385	13,300
		C	.....	20.7	66.7	12.65	.70	4.42	77.55	1.33	3.35	7,490	13,480
		D	.....	23.7	76.3	.....	.80	5.06	88.78	1.52	3.84	8,570	15,430
17690	2.4	A	3.2	17.1	64.6	15.11	1.47	4.38	72.65	1.31	5.08	7,165	12,890
		B	.8	17.5	66.2	15.48	1.51	4.22	74.42	1.34	3.03	7,340	13,210
		C	.....	17.7	66.7	15.61	1.52	4.15	75.06	1.35	2.31	7,400	13,320
		D	.....	20.9	79.1	.....	1.80	4.92	88.95	1.60	2.73	8,770	15,790
17691	2.0	A	3.1	18.9	67.1	10.88	1.52	4.60	76.38	1.29	5.33	7,455	13,420
		B	1.1	19.4	68.4	11.10	1.55	4.47	77.95	1.32	3.61	7,605	13,690
		C	.....	19.6	69.2	11.22	1.57	4.40	78.80	1.33	2.68	7,690	13,840
		D	.....	22.0	78.0	.....	1.77	4.96	88.76	1.50	3.01	8,660	15,590
17692	2.1	A	2.9	21.7	64.5	10.92	1.16	4.69	76.60	1.39	5.24	7,475	13,460
		B	.8	22.1	65.9	11.15	1.18	4.56	78.24	1.42	3.45	7,635	13,750
		C	.....	22.3	66.4	11.25	1.19	4.50	78.91	1.43	2.72	7,700	13,860
		D	.....	25.2	74.8	.....	1.34	5.07	88.92	1.61	3.06	8,680	15,620
17693	1.4	A	2.1	21.1	65.0	11.82	2.44	4.57	76.40	1.30	3.47	7,465	13,430
		B	.7	21.4	65.9	11.98	2.47	4.48	77.45	1.32	2.30	7,565	13,620
		C	.....	21.5	66.4	12.07	2.49	4.43	78.00	1.33	1.68	7,620	13,710
		D	.....	24.5	75.5	.....	2.83	5.04	88.71	1.51	1.91	8,665	15,600
17694	2.7	A	3.6	17.6	69.5	9.28	1.63	4.61	77.72	1.20	5.56	7,515	13,530
		B	1.0	18.1	71.4	9.53	1.67	4.44	79.84	1.23	3.29	7,720	13,900
		C	.....	18.3	72.1	9.62	1.69	4.37	80.60	1.24	2.48	7,795	14,030
		D	.....	20.2	79.8	.....	1.87	4.83	89.18	1.37	2.75	8,625	15,520
17695	1.7	A	2.9	18.7	73.2	5.19	.63	4.82	82.90	1.42	5.04	7,975	14,350
		B	1.2	19.0	74.5	5.28	.64	4.71	84.36	1.44	3.57	8,115	14,610
		C	.....	19.3	75.4	5.34	.65	4.63	85.37	1.46	2.55	8,210	14,780
		D	.....	20.4	79.6	.....	.69	4.89	90.18	1.54	2.70	8,675	15,620
17831	6.0	A	11.5	20.1	55.2	13.2	.78	.....	.....	.....	.....	5,680	10,230
		B	5.9	21.3	58.7	14.1	.83	.....	.....	.....	.....	6,045	10,880
		C	.....	22.7	62.3	15.0	.88	.....	.....	.....	.....	6,420	11,560
		D	.....	26.7	73.3	.....	1.03	.....	.....	.....	.....	7,555	13,600
17832	2.4	A	3.5	20.4	67.9	8.2	.83	.....	.....	.....	.....	7,610	13,700
		B	1.2	20.9	69.6	8.3	.85	.....	.....	.....	.....	7,795	14,040
		C	.....	21.1	70.4	8.5	.86	.....	.....	.....	.....	7,890	14,200
		D	.....	23.1	76.9	.....	.94	.....	.....	.....	.....	8,620	15,510

TIOGA COUNTY.

17451F	0.8	A	1.7	21.5	67.6	9.23	1.73	4.54	78.50	1.38	4.62	7,670	13,810
		B	.9	21.7	68.1	9.30	1.74	4.48	79.11	1.39	3.98	7,730	13,920
		C	.....	21.9	68.7	9.39	1.76	4.43	79.83	1.40	3.19	7,800	14,040
		D	.....	24.1	75.9	.....	1.94	4.89	88.10	1.55	3.52	8,610	15,500
17452	1.5	A	2.4	19.7	65.2	12.7	2.47	.....	.....	.....	.....	7,285	13,120
		B	.8	20.1	66.2	12.9	2.51	.....	.....	.....	.....	7,400	13,320
		C	.....	20.2	66.8	13.0	2.53	.....	.....	.....	.....	7,465	13,430
		D	.....	23.2	76.8	.....	2.91	.....	.....	.....	.....	8,575	15,440
17453	1.1	A	1.9	20.6	65.0	12.5	2.87	.....	.....	.....	.....	7,305	13,150
		B	.8	20.8	65.7	12.7	2.90	.....	.....	.....	.....	7,385	13,300
		C	.....	21.0	66.2	12.8	2.92	.....	.....	.....	.....	7,445	13,400
		D	.....	24.1	75.9	.....	3.35	.....	.....	.....	.....	8,535	15,370
17454F	1.5	A	2.3	20.9	66.9	9.88	1.28	4.52	78.15	1.43	4.74	7,565	13,620
		B	.8	21.2	68.0	10.03	1.30	4.42	79.32	1.45	3.48	7,680	13,820
		C	.....	21.4	68.5	10.11	1.31	4.37	79.98	1.46	2.77	7,745	13,940
		D	.....	23.8	76.2	.....	1.46	4.86	88.98	1.62	3.08	8,615	15,510

PENNSYLVANIA—Continued.

WESTMORELAND COUNTY.

Laboratory No.	Air-drying loss.	Form of analysis.	Proximate.			Ultimate.						Heating value.	
			Moisture.	Volatile matter.	Fixed carbon.	Ash.	Sulphur.	Hydrogen.	Carbon.	Nitrogen.	Oxygen.	Calories.	British thermal units.
17901 F	1.9	A	2.6	21.4	64.4	11.59	1.94	4.63	75.81	1.25	4.78	7,425	13,370
		B	.7	21.9	65.6	11.82	1.98	4.51	77.29	1.27	3.13	7,570	13,630
		C	.....	22.0	66.1	11.90	1.99	4.46	77.84	1.28	2.53	7,625	13,720
		D	.....	25.0	75.0	.....	2.26	5.06	88.36	1.45	2.87	8,655	15,580

UTAH.

CARBON COUNTY.

17604F	1.1	A	4.0	[a]38.0	49.9	8.06	1.15	5.66	71.91	1.47	11.75	7,130	12,840
		B	2.9	38.4	50.5	8.15	1.16	5.59	72.74	1.49	10.87	7,215	12,980
		C	.....	39.6	52.0	8.40	1.20	5.43	74.95	1.53	8.49	7,435	13,380
		D	.....	43.2	56.8	.....	1.31	5.93	81.82	1.67	9.27	8,115	14,610
17605	1.2	A	4.4	38.2	50.5	6.9	.82	.....	.....	.....	.....	7,090	12,760
		B	3.2	38.6	51.1	7.1	.83	.....	.....	.....	.....	7,180	12,920
		C	.....	39.9	52.8	7.3	.86	.....	.....	.....	.....	7,420	13,350
		D	.....	43.0	57.0	.....	.93	.....	.....	.....	.....	8,000	14,400

GRAND COUNTY.

17577F	2.0	A	7.1	37.1	45.4	10.44	0.66	5.59	65.98	1.45	15.88	6,510	11,720
		B	5.3	37.8	46.3	10.65	.67	5.48	67.29	1.48	14.43	6,640	11,950
		C	.....	39.9	48.9	11.24	.71	5.17	71.05	1.56	10.27	7,010	12,620
		D	.....	44.9	55.1	.....	.80	5.82	80.04	1.76	11.58	7,895	14,210
17578	1.3	A	6.4	37.8	45.2	10.6	.61	.....	.....	.....	.....	6.590	11,860
		B	5.1	38.3	45.9	10.7	.62	.....	.....	.....	.....	6,680	12,020
		C	.....	40.4	48.3	11.3	.65	.....	.....	.....	.....	7,040	12,670
		D	.....	45.5	54.5	.....	.73	.....	.....	.....	.....	7,935	14,280

SANPETE COUNTY.

17715	0.1	A	3.6	29.2	44.7	22.5	6.79	.....	.....	.....	.....	5,715	10,290
		B	3.6	29.2	44.7	22.5	6.80	.....	.....	.....	.....	5,725	10,300
		C	.....	30.3	46.4	23.3	7.05	.....	.....	.....	.....	5,935	10,680
		D	.....	39.5	60.5	.....	9.20	.....	.....	.....	.....	7,745	13,940
17717	.2	A	2.4	32.4	46.0	19.2	3.71	.....	.....	.....	.....	6,225	11,200
		B	2.2	32.5	46.1	19.2	3.72	.....	.....	.....	.....	6,235	11,230
		C	.....	33.2	47.1	19.7	3.80	.....	.....	.....	.....	6,375	11,480
		D	.....	41.3	58.7	.....	4.73	.....	.....	.....	.....	7,935	14,290
17718	.8	A	2.7	35.7	45.9	15.7	4.63	.....	.....	.....	.....	6,585	11,860
		B	1.9	36.0	46.2	15.9	4.67	.....	.....	.....	.....	6,635	11,950
		C	.....	36.7	47.1	16.2	4.76	.....	.....	.....	.....	6,770	12,180
		D	.....	43.8	56.2	.....	5.68	.....	.....	.....	.....	8,075	14,540

[a] Volatile matter determined by the modified official method.

VIRGINIA.

DICKENSON COUNTY.

Laboratory No.	Air-drying loss.	Form of analysis.	Proximate.				Ultimate.					Heating value.	
			Moisture.	Volatile matter.	Fixed carbon.	Ash.	Sulphur.	Hydrogen.	Carbon.	Nitrogen.	Oxygen.	Calories.	British thermal units.
17559	1.8	A	2.6	25.5	61.0	10.9	0.70	.....	.....	.....	.....	7,470	13,440
		B	.9	25.9	62.1	11.1	.71	.....	.....	.....	.....	7,605	13,690
		C	.....	26.1	62.7	11.2	.72	.....	.....	.....	.....	7,670	13,810
		D	.....	29.5	70.5	.....	.81	.....	.....	.....	.....	8,640	15,550
17560	1.7	A	2.6	26.0	63.2	8.2	.73	.....	.....	.....	.....	7,725	13,910
		B	.9	26.5	64.3	8.3	.74	.....	.....	.....	.....	7,860	14,150
		C	.....	26.7	64.9	8.4	.75	.....	.....	.....	.....	7,935	14,290
		D	.....	29.2	70.8	.....	.82	.....	.....	.....	.....	8,660	15,590
17561F	1.8	A	2.6	26.2	61.7	9.48	.74	4.75	77.60	1.57	5.86	7,575	13,640
		B	.9	26.6	62.8	9.65	.75	4.64	78.98	1.60	4.38	7,710	13,880
		C	.....	26.9	63.4	9.74	.76	4.58	79.70	1.61	3.61	7,780	14,010
		D	.....	29.8	70.2	.....	.84	5.07	88.30	1.78	4.01	8,620	15,520
17743	1.7	A	2.8	31.6	58.2	7.4	1.45	.....	.....	.....	.....	7,685	13,840
		B	1.1	32.2	59.1	7.6	1.47	.....	.....	.....	.....	7,815	14,070
		C	.....	32.5	59.8	7.7	1.49	.....	.....	.....	.....	7,905	14,230
		D	.....	35.2	64.8	.....	1.61	.....	.....	.....	.....	8,565	15,410
17744	1.8	A	3.0	32.4	58.4	6.2	1.62	.....	.....	.....	.....	7,795	14,030
		B	1.2	33.0	59.5	6.3	1.65	.....	.....	.....	.....	7,935	14,290
		C	.....	33.4	60.2	6.4	1.67	.....	.....	.....	.....	8,030	14,460
		D	.....	35.7	64.3	.....	1.78	.....	.....	.....	.....	8,575	15,440
17751	1.3	A	2.3	29.4	62.2	6.1	.76	.....	.....	.....	.....	.....	.....
		B	1.0	29.8	63.0	6.2	.77	.....	.....	.....	.....	.....	.....
		C	.....	30.1	63.6	6.3	.78	.....	.....	.....	.....	.....	.....
		D	.....	32.1	67.9	.....	.83	.....	.....	.....	.....	.....	.....
17752	1.6	A	2.5	29.2	63.2	5.1	.80	.....	.....	.....	.....	.....	.....
		B	.9	29.7	64.2	5.2	.81	.....	.....	.....	.....	.....	.....
		C	.....	29.9	64.8	5.3	.82	.....	.....	.....	.....	.....	.....
		D	.....	31.6	68.4	.....	.87	.....	.....	.....	.....	.....	.....

RUSSELL COUNTY.

18121F	1.9	A	2.9	31.9	57.8	7.4	1.78	.....	.....	.....	.....	7,655	13,780
		B	1.0	32.5	58.9	7.6	1.81	.....	.....	.....	.....	7,800	14,040
		C	.....	32.8	59.6	7.6	1.83	.....	.....	.....	.....	7,880	14,190
		D	.....	35.5	64.5	.....	1.98	.....	.....	.....	.....	8,535	15,360
18122	1.6	A	2.5	35.6	56.2	5.7	.66	.....	.....	.....	.....	7,930	14,280
		B	.9	36.1	57.2	5.8	.67	.....	.....	.....	.....	8,060	14,510
		C	.....	36.4	57.7	5.9	.68	.....	.....	.....	.....	8,135	14,640
		D	.....	38.7	61.3	.....	.72	.....	.....	.....	.....	8,640	15,550
18123	1.1	A	2.0	35.7	54.5	7.8	.66	.....	.....	.....	.....	7,685	13,830
		B	.9	36.1	55.1	7.9	.67	.....	.....	.....	.....	7,770	13,990
		C	.....	36.4	55.6	8.0	.67	.....	.....	.....	.....	7,840	14,110
		D	.....	39.5	60.5	.....	.73	.....	.....	.....	.....	8,520	15,330
18124F	1.4	A	2.3	35.5	55.5	6.71	.67	5.26	78.84	1.69	6.83	7,780	14,000
		B	.9	36.0	56.3	6.80	.68	5.18	79.94	1.71	5.69	7,890	14,200
		C	.....	36.3	56.8	6.87	.69	5.13	80.66	1.73	4.92	7,960	14,330
		D	.....	39.0	61.0	.....	.74	5.51	86.61	1.86	5.28	8,545	15,390
18128	1.0	A	1.8	35.3	55.8	7.1	.58	.....	.....	.....	.....	7,800	14,040
		B	.8	35.7	56.3	7.2	.58	.....	.....	.....	.....	7,875	14,180
		C	.....	35.9	56.8	7.3	.59	.....	.....	.....	.....	7,945	14,300
		D	.....	38.8	61.2	.....	.64	.....	.....	.....	.....	8,565	15,420
18129	1.4	A	2.4	36.3	55.1	6.2	.52	.....	.....	.....	.....	7,840	14,110
		B	1.0	36.8	55.9	6.3	.53	.....	.....	.....	.....	7,945	14,300
		C	.....	37.2	56.4	6.4	.53	.....	.....	.....	.....	8,025	14,450
		D	.....	39.7	60.3	.....	.57	.....	.....	.....	.....	8,570	15,430

VIRGINIA—Continued.

RUSSELL COUNTY—Continued.

Laboratory No.	Air-drying loss.	Form of analysis.	Proximate.				Ultimate.					Heating value.	
			Moisture.	Volatile matter.	Fixed carbon.	Ash.	Sulphur.	Hydrogen.	Carbon.	Nitrogen.	Oxygen.	Calories.	British thermal units.
18130	0.8	A	1.6	36.7	55.3	6.4	0.58	.....	.....	.....	.....	7,870	14,170
		B	.8	37.0	55.8	6.4	.58	.....	.....	.....	.....	7,935	14,290
		C	.....	37.3	56.2	6.5	.59	.....	.....	.....	.....	8,000	14.400
		D	.....	39.9	60.1	.....	.63	.....	.....	.....	.....	8,550	15,390
18131F	1.1	A	1.8	36.2	55.5	6.53	.54	5.25	79.28	1.49	6.91	7,830	14,100
		B	.8	36.5	56.1	6.60	.55	5.18	80.12	1.51	6.04	7,915	14,250
		C	.....	36.8	56.5	6.65	.55	5.14	80.76	1.52	5.38	7,980	14,360
		D	.....	39.4	60.6	.....	.59	5.51	86.51	1.63	5.76	8,545	15,380
18235	2.4	A	3.3	35.7	55.0	6.0	.55	.....	.....	.....	.....	7,760	13,970
		B	1.0	36.6	56.3	6.1	.56	.....	.....	.....	.....	7,945	14,310
		C	.....	37.0	56.8	6.2	.57	.....	.....	.....	.....	8,030	14,450
		D	.....	39.4	60.6	.....	.61	.....	.....	.....	.....	8,555	15,400
18236	2.4	A	3.2	35.4	55.1	6.3	.59	.....	.....	.....	.....	7,760	13,970
		B	.9	36.3	56.4	6.4	.60	.....	.....	.....	.....	7,945	14,300
		C	.....	36.6	56.9	6.5	.61	.....	.....	.....	.....	8,020	14,430
		D	.....	39.1	60.9	.....	.65	.....	.....	.....	.....	8,575	15,440
18237	2.4	A	3.3	35.1	56.9	4.7	.50	.....	.....	.....	.....	7,925	14,270
		B	.9	36.0	58.3	4.8	.51	.....	.....	.....	.....	8,115	14,610
		C	.....	36.3	58.8	4.9	.52	.....	.....	.....	.....	8,195	14,750
		D	.....	38.2	61.8	.....	.55	.....	.....	.....	.....	8,615	15,510
18238	2.4	A	3.3	35.1	55.9	5.71	.55	5.37	78.72	1.37	8.28	7,820	14,080
		B	1.0	35.9	57.2	5.85	.56	5.23	80.62	1.40	6.34	8,010	14,420
		C	.....	36.3	57.8	5.91	.57	5.17	81.44	1.42	5.49	8,095	14,570
		D	.....	38.5	61.5	.....	.61	5.49	86.55	1.51	5.84	8,600	15,490
18239	1.0	A	1.8	31.4	60.3	6.5	.52	.....	.....	.....	.....	7,880	14,180
		B	.8	31.8	60.9	6.5	.53	.....	.....	.....	.....	7,960	14,330
		C	.....	32.0	61.4	6.6	.53	.....	.....	.....	.....	8,025	14,440
		D	.....	34.3	65.7	.....	.57	.....	.....	.....	.....	8,590	15,460
18240	1.8	A	2.5	31.9	59.5	6.1	.44	.....	.....	.....	.....	7,820	14,070
		B	.8	32.4	60.6	6.2	.45	.....	.....	.....	.....	7,960	14,330
		C	.....	32.7	61.1	6.2	.45	.....	.....	.....	.....	8,020	14,430
		D	.....	34.9	65.1	.....	.48	.....	.....	.....	.....	8,555	15,400
18241	1.9	A	2.4	32.5	58.4	6.7	.49	.....	.....	.....	.....	7,790	14,020
		B	.6	33.1	59.5	6.8	.50	.....	.....	.....	.....	7,940	14,290
		C	.....	33.3	59.8	6.9	.50	.....	.....	.....	.....	7,985	14,380
		D	.....	35.7	64.3	.....	.54	.....	.....	.....	.....	8,575	15,440
18242	1.6	A	2.2	31.9	59.4	6.50	.46	5.11	79.69	1.04	7.20	7,840	14,110
		B	.6	32.5	60.3	6.60	.47	5.02	80.94	1.06	5.91	7,960	14,330
		C	.....	32.7	60.7	6.65	.47	4.98	81.48	1.06	5.36	8,015	14,430
		D	.....	35.0	65.0	.....	.50	5.33	87.28	1.14	5.75	8,585	15,460
18243	2.4	A	3.1	33.7	57.3	5.9	.79	.....	.....	.....	.....	7,860	14,150
		B	.8	34.5	58.7	6.0	.81	.....	.....	.....	.....	8,050	14,490
		C	.....	34.8	59.1	6.1	.82	.....	.....	.....	.....	8,115	14,600
		D	.....	37.0	63.0	.....	.87	.....	.....	.....	.....	8,640	15,550
18244	1.6	A	2.4	34.6	57.3	5.7	.83	.....	.....	.....	.....	7,945	14,300
		B	.8	35.2	58.3	5.7	.84	.....	.....	.....	.....	8,075	14,540
		C	.....	35.5	58.7	5.8	.85	.....	.....	.....	.....	8,140	14,660
		D	.....	37.6	62.4	.....	.90	.....	.....	.....	.....	8,645	15,560
18245	2.0	A	2.7	33.7	57.9	5.7	.78	.....	.....	.....	.....	7,920	14,260
		B	.8	34.4	59.0	5.8	.80	.....	.....	.....	.....	8,080	14,540
		C	.....	34.7	59.5	5.8	.80	.....	.....	.....	.....	8,145	14,660
		D	.....	36.8	63.2	.....	.85	.....	.....	.....	.....	8,650	15,570
18246	2.0	A	2.7	33.8	57.7	5.78	.83	5.27	79.33	1.29	7.50	7,915	14,250
		B	.7	34.5	58.9	5.90	.85	5.15	80.93	1.32	5.85	8,075	14,530
		C	.....	34.8	59.3	5.94	.85	5.11	81.55	1.33	5.22	8,135	14,650
		D	.....	37.0	63.0	.....	.90	5.43	86.70	1.41	5.56	8,650	15,570

VIRGINIA—Continued.

WISE COUNTY.

Laboratory No.	Air-drying loss.	Form of analysis.	Proximate.				Ultimate.					Heating value.	
			Moisture.	Volatile matter.	Fixed carbon.	Ash.	Sulphur.	Hydrogen.	Carbon.	Nitrogen.	Oxygen.	Calories.	British thermal units.
18226	1.5	A	2.4	33.4	59.4	4.8	0.58	.....	.....	.....	.....	8,035	14,460
		B	.9	33.9	60.3	4.9	.59	.....	.....	.....	.....	8,160	14,680
		C	.....	34.2	60.9	4.9	.59	.....	.....	.....	.....	8,235	14,830
		D	.....	36.0	64.0	.....	.62	.....	.....	.....	.....	8,660	15,590
18227	1.5	A	2.3	32.9	59.9	4.9	.53	.....	.....	.....	.....	8,035	14,460
		B	.9	33.4	60.7	5.0	.54	.....	.....	.....	.....	8,150	14,670
		C	.....	33.7	61.3	5.0	.54	.....	.....	.....	.....	8,225	14,810
		D	.....	35.5	64.5	.....	.57	.....	.....	.....	.....	8,665	15,600
18228	1.4	A	2.3	32.7	59.2	5.8	.51	.....	.....	.....	.....	7,985	14,370
		B	.9	33.2	60.1	5.8	.52	.....	.....	.....	.....	8,100	14,580
		C	.....	33.5	60.6	5.9	.52	.....	.....	.....	.....	8,170	14 710
		D	.....	35.5	64.5	.....	.55	.....	.....	.....	.....	8,685	15,630
18229F	1.5	A	2.3	32.9	59.6	5.22	.54	5.18	80.78	1.57	6.71	8,010	14,420
		B	.8	33.4	60.5	5.30	.55	5.09	81.97	1.59	5.50	8,130	14,630
		C	.....	33.7	61.0	5.34	.55	5.05	82.67	1.61	4.78	8,200	14,760
		D	.....	35.5	64.5	.....	.58	5.33	87.33	1.70	5.06	8,660	15,590

WEST VIRGINIA.

McDOWELL COUNTY.

17469	1.0	A	1.8	19.7	71.1	7.4	0.50	.....	.....	.....	.....	7,850	14,130
		B	.9	19.9	71.7	7.5	.50	.....	.....	.....	.....	7,925	14,270
		C	.....	20.0	72.4	7.6	.51	.....	.....	.....	.....	7,995	14,390
		D	.....	21.7	78.3	.....	.55	.....	.....	.....	.....	8,650	15,570
17470	1.4	A	2.2	20.2	69.8	7.8	.77	.....	.....	.....	.....	7,820	14,070
		B	.8	20.5	70.8	7.9	.78	.....	.....	.....	.....	7,930	14,270
		C	.....	20.7	71.3	8.0	.79	.....	.....	.....	.....	7,995	14,390
		D	.....	22.4	77.6	.....	.86	.....	.....	.....	.....	8,690	15,640
17471F	1.2	A	2.0	19.9	70.4	7.71	.69	4.47	80.95	1.53	4.65	7,835	14,110
		B	.8	20.2	71.2	7.80	.70	4.39	81.92	1.55	3.64	7,930	14,280
		C	.....	20.3	71.8	7.87	.70	4.34	82.60	1.56	2.93	7,995	14,400
		D	.....	22.1	77.9	.....	.76	4.71	89.65	1.69	3.19	8,680	15,620

MINGO COUNTY.

17462	1.8	A	4.0	37.3	53.8	4.9	0.68	.....	.....	.....	.....	7,610	13,700
		B	2.2	38.0	54.8	5.0	.69	.....	.....	.....	.....	7,750	13,950
		C	.....	38.9	56.0	5.1	.71	.....	.....	.....	.....	7,925	14,270
		D	.....	40.9	59.1	.....	.75	.....	.....	.....	.....	8,350	15,030
17463	1.8	A	4.1	36.8	51.3	7.8	.80	.....	.....	.....	.....	7,310	13,150
		B	2.3	37.5	52.3	7.9	.81	.....	.....	.....	.....	7,440	13,400
		C	.....	38.4	53.5	8.1	.83	.....	.....	.....	.....	7,615	13,710
		D	.....	41.8	58.2	.....	.90	.....	.....	.....	.....	8,290	14,930
17464	2.3	A	4.7	36.2	51.4	7.7	.65	.....	.....	.....	.....	7,260	13,070
		B	2.4	37.1	52.6	7.9	.67	.....	.....	.....	.....	7,430	13,380
		C	.....	38.0	53.9	8.1	.68	.....	.....	.....	.....	6,715	13,710
		D	.....	41.4	58.6	.....	.74	.....	.....	.....	.....	8,290	14,920
17465F	2.0	A	4.2	37.3	51.7	6.81	.73	5.22	75.47	1.55	10.22	7,395	13,310
		B	2.3	38.0	52.7	6.95	.74	5.10	76.99	1.58	8.64	7,545	13,580
		C	.....	38.9	54.0	7.11	.76	4.96	78.80	1.62	6.75	7,720	13,900
		D	.....	41.9	58.1	.....	.82	5.34	84.83	1.74	7.27	8,315	14,960
17466	2.1	A	4.5	35.5	51.3	8.7	.80	.....	.....	.....	.....	7,195	12,950
		B	2.4	36.3	52.4	8.9	.82	.....	.....	.....	.....	7,350	13,230
		C	.....	37.1	53.8	9.1	.84	.....	.....	.....	.....	7,535	13,560
		D	.....	40.9	59.1	.....	.92	.....	.....	.....	.....	8,290	14,920

WEST VIRGINIA—Continued.

MINGO COUNTY—Continued.

Laboratory No.	Air-drying loss.	Form of analysis.	Proximate.				Ultimate.					Heating value.	
			Moisture.	Volatile matter.	Fixed carbon.	Ash.	Sulphur.	Hydrogen.	Carbon.	Nitrogen.	Oxygen.	Calories.	British thermal units.
17467	2.4	A	5.5	32 8	50.0	11.7	1.02	.....	.....	.....	.....	6,795	12,230
		B	3.1	33.6	51.3	12.0	1.04	.....	.....	.....	.....	6,960	12,530
		C	.....	34.7	52.9	12.4	1.08	.....	.....	.....	.....	7,185	12,940
		D	.....	39.6	60.4	.....	1.23	.....	.....	.....	.....	8,205	14,770
17468F	2.3	A	5.0	33.8	50.9	10.31	.85	5.15	71.13	1.51	11.05	6,975	12,550
		B	2.7	34.6	52.1	10.55	.87	5.01	72.77	1.55	9.25	7,135	12,840
		C	.....	35.6	53.6	10.85	.89	4.84	74.84	1.59	6.99	7,335	13,210
		D	.....	39.9	60.1	.....	1.00	5.43	83.95	1.78	7.84	8,230	14,810
17472F	1.7	A	3.6	35.6	56.5	4.33	.66	5.41	79.67	1.51	8.42	7,775	13,990
		B	1.9	36.2	57.5	4.40	.67	5.31	81.04	1.54	7.04	7,910	14,230
		C	.....	36.9	58.6	4.49	.68	5.19	82.61	1.57	5.46	8,060	14,510
		D	.....	38.6	61.4	.....	.71	5.43	86.49	1.64	5.73	8,440	15,190
17473F	1.5	A	3.7	33.6	59.1	3.64	.64	5.46	79.79	1.53	8.94	7,780	14,010
		B	2.2	34.1	60.0	3.70	.65	5.37	81.00	1.55	7.73	7,900	14,220
		C	.....	34.8	61.4	3.78	.66	5.24	82.85	1.59	5.88	8,080	14,550
		D	.....	36.2	63.8	.....	.69	5.45	86.11	1.65	6.10	8,400	15,120
17474F	.8	A	2.2	36.0	54.3	7.54	1.65	5.00	76.45	1.58	7.78	7,650	13,770
		B	1.4	36.3	54.7	7.60	1.66	4.96	77.03	1.59	7.16	7,705	13,870
		C	.....	36.8	55.5	7.71	1.69	4.86	78.12	1.61	6.01	7,815	14,070
		D	.....	39.9	60.1	.....	1.83	5.27	84.64	1.74	6.52	8,470	15,250
17475F	.8	A	2.4	32.8	60.5	4.30	.74	5.06	79.82	1.53	8.55	7,955	14,320
		B	1.6	33.1	61.0	4.33	.75	5.01	80.45	1.54	7.92	8,015	14,430
		C	.....	33.6	62.0	4.41	.76	4.91	81.78	1.57	6.57	8,150	14,670
		D	.....	35.2	64.8	.....	.80	5.14	85.55	1.64	6.87	8,525	15,350
17476	1.4	A	2.8	31.5	61.1	4.6	1.39	.....	.....	.....	.....	7,905	14,230
		B	1.4	32.0	62.0	4.6	1.41	.....	.....	.....	.....	8,020	14,430
		C	.....	32.4	62.9	4.7	1.43	.....	.....	.....	.....	8,140	14,650
		D	.....	34.0	66.0	.....	1.50	.....	.....	.....	.....	8,535	15,360
17477	1.9	A	3.3	31.0	60.4	5.3	1.14	.....	.....	.....	.....	7,765	13,980
		B	1.4	31.6	61.5	5.5	1.16	.....	.....	.....	.....	7,915	14,240
		C	.....	32.1	62.4	5.5	1.18	.....	.....	.....	.....	8,030	14,450
		D	.....	33.9	66.1	.....	1.25	.....	.....	.....	.....	8,500	15,300
17478	1.9	A	3.3	30.9	58.9	6.9	1.11	.....	.....	.....	.....	7,680	13,830
		B	1.5	31.5	60.0	7.0	1.13	.....	.....	.....	.....	7,830	14,090
		C	.....	32.0	60.9	7.1	1.15	.....	.....	.....	.....	7,950	14,310
		D	.....	34.4	65.6	.....	1.24	.....	.....	.....	.....	8,555	15,400
17479F	1.7	A	3.1	31.4	59.9	5.60	1.18	5.12	79.51	1.60	6.99	7,805	14,050
		B	1.4	32.0	60.9	5.70	1.20	5.02	80.90	1.63	5.55	7,945	14,300
		C	.....	32.4	61.8	5.78	1.22	4.93	82.09	1.65	4.33	8,060	14,510
		D	.....	34.4	65.6	.....	1.29	5.23	87.12	1.75	4.61	8,555	15,400
17480	2.0	A	4.5	38.8	50.9	5.8	2.01	.....	.....	.....	.....	7,425	13,370
		B	2.5	39.6	52.0	5.9	2.05	.....	.....	.....	.....	7,580	13,650
		C	.....	40.6	53.3	6.1	2.10	.....	.....	.....	.....	7,775	13,990
		D	.....	43.2	56.8	.....	2.24	.....	.....	.....	.....	8,275	14,900
17481	2.8	A	5.7	37.0	49.5	7.8	1.87	.....	.....	.....	.....	7,100	12,780
		B	3.0	38.1	50.9	8.0	1.92	.....	.....	.....	.....	7,300	13,140
		C	.....	39.2	52.5	8.3	1.98	.....	.....	.....	.....	7,530	13,550
		D	.....	42.8	57.2	.....	2.16	.....	.....	.....	.....	8,210	14,780
17483	1.3	A	3.0	34.7	58.9	3.4	.66	.....	.....	.....	.....	7,920	14,250
		B	1.7	35.1	59.7	3.5	.67	.....	.....	.....	.....	8,025	14,440
		C	.....	35.7	60.8	3.5	.68	.....	.....	.....	.....	8,165	14,700
		D	.....	37.0	63.0	.....	.70	.....	.....	.....	.....	8,460	15,230

WYOMING.

CONVERSE COUNTY.

Laboratory No.	Air-drying loss.	Form of analysis.	Proximate.				Ultimate.					Heating value.	
			Moisture.	Volatile matter.	Fixed carbon.	Ash.	Sulphur.	Hydrogen.	Carbon.	Nitrogen.	Oxygen.	Calories.	British thermal units.
17657	7.0	A	22.8	34.7	37.0	5.52	0.71	6.07	54.68	1.02	32.00	5,150	9,270
		B	17.0	37.3	39.8	5.93	.76	5.70	58.77	1.10	27.74	5,535	9,960
		C	.....	44.9	48.0	7.15	.92	4.58	70.79	1.32	15.24	6,670	12,000
		D	.....	48.4	51.6	.....	.99	4.93	76.24	1.42	16.42	7,180	12,930
17658	5.5	A	21.1	[a] 31.5	41.3	6.1	.73	.....	.....	.....	.....	5,105	9,190
		B	16.5	33.3	43.7	6.5	.77	.....	.....	.....	.....	5,400	9,720
		C	.....	39.9	52.3	7.8	.92	.....	.....	.....	.....	6,470	11,640
		D	.....	43.3	56.7	.....	1.00	.....	.....	.....	.....	7,015	12,630
17722F	5.6	A	25.1	[a] 32.0	38.1	4.77	.73	6.31	52.81	1.16	34.22	4,980	8,970
		B	20.6	33.9	40.4	5.05	.77	6.03	55.94	1.23	30.98	5,275	9,500
		C	.....	42.7	50.9	6.37	.97	4.70	70.50	1.55	15.91	6,650	11,970
		D	.....	45.6	54.4	.....	1.04	5.02	75.29	1.66	16.99	7,100	12,780
17723F	5.5	A	23.5	[a] 34.3	35.2	7.00	.59	5.85	51.19	.99	34.38	4,755	8,560
		B	19.1	36.3	37.2	7.40	.62	5.54	54.15	1.05	31.24	5,030	9,050
		C	.....	44.9	46.0	9.15	.77	4.23	66.90	1.29	17.66	6,210	11,180
		D	.....	49.4	50.6	.....	.85	4.66	73.64	1.42	19.43	6,835	12,310
17902	14.1	A	27.2	[a] 29.7	36.1	7.0	.40	.....	.....	.....	.....	4,275	7,700
		B	15.3	34.6	42.0	8.1	.47	.....	.....	.....	.....	4,975	8,950
		C	.....	40.8	49.6	9.6	.55	.....	.....	.....	.....	5,870	10,570
		D	.....	45.2	54.8	.....	.61	.....	.....	.....	.....	6,495	11,690

FREMONT COUNTY.

17584	[b] 2.1	A	13.1	38.8	34.3	13.8	3.47	.....	.....	.....	.....	5,445	9,800
		B	11.3	39.7	35.0	14.0	3.54	.....	.....	.....	.....	5,560	10,010
		C	.....	44.7	39.5	15.8	4.00	.....	.....	.....	.....	6,270	11,280
		D	.....	53.1	46.9	.....	4.75	.....	.....	.....	.....	7,450	13,410

HOT SPRINGS COUNTY.

17709	2.0	A	13.7	35.8	41.7	8.8	0.60	.....	.....	.....	.....	5,800	10,440
		B	11.9	36.6	42.6	8.9	.61	.....	.....	.....	.....	5,915	10,650
		C	.....	41.5	48.3	10.2	.69	.....	.....	.....	.....	6,720	12,090
		D	.....	46.2	53.8	.....	.77	.....	.....	.....	.....	7,480	13,460
17830	2.2	A	11.5	34.3	40.0	14.2	.45	.....	.....	.....	.....	5,545	9,990
		B	9.5	35.0	40.9	14.6	.46	.....	.....	.....	.....	5,675	10,210
		C	.....	38.7	45.2	16.1	.51	.....	.....	.....	.....	6,270	11,280
		D	.....	46.1	53.9	.....	.61	.....	.....	.....	.....	7,475	13,450
17731	11.6	A	25.2	33.1	36.0	5.7	.98	.....	.....	.....	.....	4,180	7,520
		B	15.3	37.5	40.7	6.5	1.11	.....	.....	.....	.....	4,730	8,510
		C	.....	44.2	48.1	7.7	1.31	.....	.....	.....	.....	5,580	10,050
		D	.....	47.9	52.1	.....	1.42	.....	.....	.....	.....	6,045	10,880

NATRONA COUNTY.

17778	6.1	A	24.1	[a] 33.6	36.8	5.5	0.70	.....	.....	.....	.....	4,840	8,710
		B	19.2	35.8	39.2	5.8	.75	.....	.....	.....	.....	5,155	9,280
		C	.....	44.3	48.5	7.2	.92	.....	.....	.....	.....	6,380	11,480
		D	.....	47.8	52.2	.....	.99	.....	.....	.....	.....	6,875	12,370
17895	10.0	A	24.9	[a] 30.7	39.3	5.1	.40	.....	.....	.....	.....	4,830	8,700
		B	16.5	34.1	43.7	5.7	.45	.....	.....	.....	.....	5,370	9,670
		C	.....	40.9	52.3	6.8	.53	.....	.....	.....	.....	6,435	11,580
		D	.....	43.9	56.1	.....	.57	.....	.....	.....	.....	6,900	12,420

[a] Volatile matter determined by the modified official method.
[b] This small air-drying loss indicates that the coal is weathered.

DESCRIPTIONS OF COAL SAMPLES.

ALABAMA.

DEKALB COUNTY.

18230. Semibituminous coal from Yellow Creek mine of W. C. Hill, sec. 24(?), T. 7 S., R. 9 E., 3 miles northwest of Blanche. Sample cut in mine 300 feet south of mouth, from surface of coal weathered for 10 months, on November 20, 1913, by Charles Butts. Sample dry. Section at point of sampling is as follows:

Section of coal bed in Yellow Creek mine.

	Ft.	in.
Coal [1,2]	1	1
Clay [2]		½
Coal [1,2]		3
Clay [2]		½
Coal [1,2]		4
Clay [2]		1
Coal [1,2]		3½
	2	1½

18233. Semibituminous coal from same locality as No. 18230. Sample cut 20 inches below surface of coal weathered for 10 months. Sample dry.

18234. Semibituminous coal from same locality as No. 18230. Sample cut 1 foot below surface of coal weathered for 10 months. Sample dry.

18231. Semibituminous coal from Beeson Gap mine of McSpaden & Baker, T. 7 S., R. 9 E., 1 mile northeast of Fort Payne. Sample cut in mine 200 feet northeast of mouth on November 20, 1913, by Charles Butts. Coal bed at point sampled is 1 foot 1 inch thick. Sample represents entire thickness of bed. Sample dry.

18232. Semibituminous coal from prospect pit of W. T. Underwood, sec. 31 (?), T. 7 S., R. 10 E., 1 mile west of Blanche. Sample cut in pit 10 feet from mouth on November 20, 1913, by Charles Butts. Sample dry. Section at point of sampling is as follows:

Section of coal bed in prospect pit of W. T. Underwood.

	Ft.	in.
Coal	1	9
"Rash" [3]		2
	1	11

[1] Part sampled for Nos. 18230 and 18234.
[2] Part sampled for No. 18233.
[3] Not included in sample.

COLORADO.

LA PLATA COUNTY.

17745F. Bituminous coal from Mormon mine in sec. 17, T. 33 N., R. 11 W. Sample cut at end of main entry, 50 feet from mouth of mine, on August 6, 1913, by M. A. Pishel. Section at point of sampling is as follows:

Section of coal bed in Mormon mine.

	Ft.	in.
Coal		7
Shale [1]		½
Coal		7
Shale		¼
Coal, bony	1	9
Shale [1]		1
Coal		11
Shale [1]		½
Coal	1	5
	5	5¼

17747. Bituminous coal from Cinder Butte mine in sec. 14, T. 32 N., R. 12 W. Sample cut at end of entry on August 5, 1913, by M. A. Pishel. Coal weathered. Section at point of sampling is as follows:

Section of coal bed in Cinder Butte mine.

	Ft.	in.
Coal, bony		5
Coal		8
Shale [1]		1
Coal		3
Bone		5
Coal		5
Coal, bony		9
Bone		2
Coal	1	10
	5	

17748. Bituminous coal from Soda Spring mine in sec. 1, T. 32 N., R. 12 W. Sample cut in mine 100 feet west of mouth on August 5, 1913, by M. A. Pishel. Section at point of sampling is as follows:

Section of coal bed in Soda Spring mine.

	Ft.	in.
Coal, bony [1]	2	6
Coal	2	10
Shale [1]		11

[1] Not included in sample.

	Ft.	in.
Coal	1	10
Bone [1]		1
Coal		8
Bone [1]		1
Coal		8
Bone [1]	2	1
	11	8

17855. Bituminous coal from Wheeler mine in Hay Gulch in sec. 31, T. 35 N., R. 11 W., 7½ miles southwest of Hesperus, Upper No. 5 bed. Sample cut near end of entry, 75 feet from mouth of mine, on September 12, 1913, by M. A. Pishel. Section at point of sampling is as follows:

Section of coal bed in Wheeler mine.

	Ft.	in.
Coal	1	8
Bone [1]		1
Coal	3	
Coal, bony		10
	5	7

MOFFAT COUNTY.

17592. Subbituminous coal from Seick mine in sec. 2, T. 7 N., R. 92 W., 8 miles northwest of Craig. Sample cut in mine 120 feet N. 80° E. of mouth on July 24, 1913, by E. T. Hancock. Mine had not been worked for two years. Sample weathered (?). Section at point of sampling is as follows:

Section of coal bed in Seick mine.

	Ft.	in.
Coal (not mined)[1]	2	3
Coal	5	3
	7	6

17593. Subbituminous coal from Kimberly mine (not operated) in sec. 32, T. 7 N., R. 90 W. Kimberly bed. Sample cut in mine 120 feet N. 12° E. of mouth on July 25, 1913, by E. T. Hancock. Sample was wet (weathered ?). Section at point of sampling is as follows:

[1] Not included in sample.

Section of coal bed in Kimberly mine.

	Ft.	in.
Coal, impure	2	1
Coal	2	1
Coal, impure	1	5
Coal	2	1
	7	8

17686. Bituminous (?) coal from Lay mine of Wisconsin Coal Mining Co., 1 mile south of Lay, in sec. 31, T. 7 N., R. 93 W. Sample cut in mine 270 feet south of mouth on August 21, 1913, by E. T. Hancock. Sample weathered (?). Section at point of sampling is as follows:

Section of coal bed in Lay mine.

	Ft.	in.
Coal		11½
Coal, with streaks of shale		5
Sandstone		1½
Coal, with thin streaks of shale		4
Coal	1	
Shale, sandy		1½
Coal, with thin streaks of shale		6½
Coal [1]	4	7
Shale, sandy		7
Coal		10
Coal, with some streaks of shale	1	11
	11	5

17696. Subbituminous coal from Blevins mine in sec. 28, T. 8 N., R. 93 W. Sample cut in mine 140 feet N. 50° E. of mouth on August 19, 1913, by E. T. Hancock. Sample weathered (?). Section at point of sampling is as follows:

Section of coal bed in Blevins mine.

	Ft.	in.
Coal	1	5
Shale		1
Coal [1]	9	11½
	11	5½

17782. Subbituminous coal from Hart mine in T. 4 N., R. 91 W. (not subdivided). Sample cut in mine 100 feet N. 39° W. of mouth on September 22, 1913,

[1] Part sampled.

by E. T. Hancock. Coal bed at point sampled is 6 feet 9 inches thick, and sample represents entire bed. Sample wet.

17840. Bituminous (?) coal from Roby mine in T. 4 N., R. 91 W. (not subdivided). Sample cut in mine 75 feet N. 56° W. of mouth on September 24, 1913, by E. T. Hancock. Sample represents 7 feet 1½ inches of coal, entire thickness of bed. Sample wet and weathered.

ILLINOIS.

McDONOUGH COUNTY.

15119. Bituminous coal from mine of Frank Burdick in NE. ¼ sec. 16, T. 4 N., R. 2 W., 1 mile northwest of Industry. Murphysboro bed. Composite of samples 15117 and 15118.[1]

KENTUCKY.

PIKE COUNTY.

17459F. Bituminous coal from No. 2 mine of Burnwell Coal & Coke Co., 2 miles west of Matewan. No. 2 or Gas bed. Sample cut in room 9 off fourth left entry off main entry, 2,000 feet from mine mouth, on June 3, 1913, by Eugene Stebinger. Sample dry. Section at point of sampling is as follows:

Section of coal bed in No. 2 mine.

	Ft.	in.
Coal		5
Bone [2]		7
Coal	1	2
Clay [2]		2
Coal	2	
Coal, splint		9
	5	1

17460F. Bituminous coal from Little Thacker mine of Thacker Coal Co., 1½ miles southwest of Thacker, Alum bed. Sample cut at face of first right entry off main air course, 700 feet from mine mouth, on June 5, 1913, by Eugene Stebinger. Sample dry. Section at point of sampling is as follows:

Section of Alum coal bed in Little Thacker mine.

	Ft.	in.
Coal, bony		1½
Coal	2	5
Clay [1]		4
Coal, splint	1	8
	4	6½

17461F. Bituminous coal from Little Thacker mine of Thacker Coal Co., 1½ miles southwest of Thacker. Thacker bed. Sample cut at last right entry off No. 2 drift, 3,000 feet from mine mouth, on June 5, 1913, by Eugene Stebinger. Sample dry. Section at point of sampling is as follows:

Section of Thacker coal bed in Little Thacker mine.

	Ft.	in.
Coal, lustrous	1	4
Coal, splint	1	4
Coal, gray, splint		7
Coal, lustrous	1	10
	5	1

MONTANA.

BIG HORN COUNTY.

17711. Subbituminous coal from local strip pit in sec. 30, T. 1 N., R. 38 E., 36 miles south of Sanders. Sample cut 6 feet deep under heavy sandstone on August 27, 1913, by G. S. Rogers. Sample dry. Section at point of sampling is as follows:

Section of coal bed in local bank.

	Ft.	in.
Bone		2
Coal [2]	7	
Coal (weathered)	3	4
Coal, reported in drill record	21	
	31	6

HILL COUNTY.

17841F. Subbituminous coal from old mine of A. M. Banks and Charles Severn, in NW. ¼ sec. 28, T. 37 N., R. 9 E. No. 1 bed. Sample cut in first room on right,

[1] See U. S. Geol. Survey Bull. 531, pp. 338–339, 1913.
[2] Not included in sample.

[1] Not included in sample.
[2] Part sampled.

75 feet from mine mouth, on September 30, 1913, by Eugene Stebinger. Sample dry. Section at point of sampling is as follows:

Section of coal bed in old mine of A. M. Banks and Charles Severn.

	Ft.	in.
Coal	3	2
Shale, coaly [1]		5
	3	7

17842F. Bituminous coal from West Butte mine of P. J. McDermott, NW. ¼ sec. 6, T. 36 N., R. 2 E. Sample cut in mine 100 feet west of shaft on September 11, 1913, by Eugene Stebinger. Sample dry. Section at point of sampling is as follows:

Section of coal bed in West Butte mine.

	Ft.	in.
Coal	2	1
Shale [1]		4
	2	5

17892. Subbituminous coal from outcrop in SW. ¼ sec. 2, T. 37 N., R. 9 E., 35 miles north of Rudyard. No. 1 bed. Sample cut September 28, 1913, by Eugene Stebinger. Sample dry and weathered. Section at point of sampling is as follows:

Section of coal bed on outcrop.

	Ft.	in.
Coal	2	8
Shale, coaly [1]		4
	3	

MUSSELSHELL COUNTY.

17586F. Subbituminous coal from mine No. 2 of Republic Coal Co., in SE. ¼ sec. 36, T. 8 N., R. 25 E., 3½ miles southeast of Roundup. Roundup bed. Sample cut in mine 800 feet east of shaft on July 21, 1913, by C. T. Lupton. Sample dry. Section at point of sampling is as follows:

Section of coal bed in mine No. 2.

	Ft.	in.
Coal	4	3
Bone [1]		1
Coal	1	6
	5	10

[1] Not included in sample.

17587. Subbituminous coal from mine No. 4 of Davis Coal Co., in SE. ¼ sec. 17, T. 8 N., R. 25 E., 3 miles southeast of Roundup. Roundup bed. Sample cut in mine 3,000 feet S. 5° W. of mouth on July 21, 1913, by C. T. Lupton. Sample damp. Section at point of sampling is as follows:

Section of coal bed in mine No. 4.

	Ft.	in.
Coal		2
Bone [1]		2
Coal	3	2
	3	6

17588. Subbituminous coal from mine No. 3 of Roundup Coal Mining Co., NE. ¼ sec. 22, T. 8 N., R. 25 E., one-half mile west of Roundup. Roundup bed. Sample cut in room 2, off seventh entry west, 3,000 feet west from mouth of entry, on July 21, 1913, by C. T. Lupton. Sample represents 5 feet 8 inches of coal, entire thickness of bed. Sample dry.

17589. Subbituminous coal from Keene mine of Pine Creek Coal Mining Co., in NE. ¼ sec. 28, T. 8 N., R. 25 E., 3½ miles southwest of Roundup. Roundup bed. Sample cut in mine 500 feet northeast of mouth on July 19, 1913, by C. T. Lupton. Sample represents 3 feet of coal, entire thickness of bed. Sample dry.

NEW MEXICO.

COLFAX COUNTY.

17703. Bituminous coal from Brilliant mine of St. Louis, Rocky Mountain & Pacific Co., T. 31 N., R. 23 E. Tin Pan bed. Sample cut in first east entry off No. 5 main south entry of Tin Pan Canyon on August 30, 1913, by W. T. Lee. Section at point of sampling is as follows:

Section of coal bed in Brilliant mine.

	Ft.	in.
Coal		6
Shale [1]		2
Coal		9
Shale [1]		8
Coal	1	9
Bone [1]		½

[1] Not included in sample.

	Ft.	in.
Coal	1	2
Shale [1]		2
Coal		8
	5	10½

17746F. Bituminous coal from mine of Yankee Fuel Co., in sec. 35, T. 32 N., R. 62 W. Highest bed. Sample cut in mine 570 feet N. 20° E. from mouth on September 18, 1913, by W. T. Lee. Sample dry. Section at point of sampling is as follows:

Section of coal bed in mine of Yankee Fuel Co.

	Ft.	in.
Coal		7
Shale [1]		11
Coal	1	7
Shale [1]	1	1
Coal	1	9
	5	11

17781F. Bituminous coal from Koehler No. 3 mine of St. Louis, Rocky Mountain & Pacific Co., at Koehler. Raton bed. Sample cut in room 71, off second east entry, on September 23, 1913, by W. T. Lee. Sample dry. Section at point of sampling is as follows:

Section of coal bed in Koehler No. 3 mine.

	Ft.	in.
Coal		10
Coal, bony		4
Coal		6
Bone [1]		1
Coal	1	5
Bone [1]		½
Coal	1	1
Bone [1]	1	4
Coal		9
Bone [1]		1
Coal	3	2
	9	7½

SAN JUAN COUNTY.

17749. Bituminous coal from the New Mexico mine in sec. 22, T. 32 N., R. 12 W., 28½ miles southwest of Durango. Bed A. Sample cut in mine 75 feet east of mouth on August 5, 1913, by M. A. Pishel. Sample dry. Section at point of sampling is as follows:

Section of coal bed in New Mexico mine.

	Ft.	in.
Coal, bony	4	9
Shale [1]		2
Coal	2	1
	7	

17750. Bituminous coal from Government mine in sec. 21, T. 30 N., R. 16 W., 20 miles northwest of Farmington. Hogback bed. Sample cut in mine 100 feet southwest of mouth on August 22, 1913, by M. A. Pishel. Sample represents 6 feet 3 inches of coal, entire thickness of bed.

SOCORRO COUNTY.

17602. Bituminous (?) coal from prospect in sec. 18, T. 1 N., R. 6 W., 20 miles northwest of Magdalena. Sample cut in face of entry, 30 feet from mouth, on July 28, 1913, by D. E. Winchester, Sample dry. Section at point of sampling is as follows:

Section of coal bed in prospect.

	Ft.	in.
Bone [1]		2
Coal		4½
Shale, carbonaceous [1]		2
Coal		4
Shale [1]		½
Coal	1	7
	2	7½

17728. Bituminous coal from prospect in SW. ¼ sec. 20, T. 3 N., R. 9 W., 65 miles northwest of Magdalena. Sample cut in face of entry, 8 feet from mouth, on September 5, 1913, by D. E. Winchester. Sample dry and slightly weathered. Section at point of sampling is as follows:

Section of coal bed in prospect.

	Ft.	in.
Coal		6
Bone [1]		2
Coal		6
Bone [1]		1½
Coal	2	3
	3	6½

[1] Not included in sample.

[1] Not included in sample.

OREGON.

GRANT COUNTY.

18125. Lignite from prospect on the Stewart ranch in NW. ¼ NW. ¼ sec. 11, T. 13 S., R. 27 E., 5½ miles east of Dayville. Sample cut from face of old prospect. Lignite probably weathered. Section at point of sampling is as follows:

Section of lignite bed in old prospect.

	Ft.	in.
Lignite [1]	1	
Sandstone [1]		6
Lignite	2	2
Sandstone [1]		4
Lignite [1]	1	8
	5	8

WHEELER COUNTY.

18126. Subbituminous (?) coal from prospect in Dry Hollow in SW. ¼ SE. ¼ sec. 28, T. 8 S., R. 21 E. Sample cut 20 feet from mouth of drift 130 feet long. Section at point of sampling is as follows:

Section of coal bed in prospect in Dry Hollow.

	Ft.	in.
Coal and bone [2]	1	
Coal and bone [2 3]	1	6
Sandstone		6
Coal [3]	1	6
Coal [2 3]	5	6
	10	

18127. Subbituminous (?) coal from same locality as No. 18126.

PENNSYLVANIA.

CENTER COUNTY.

17444F. Bituminous coal from Macon drift, Poormansite mine of Lehigh Valley Coal Co., 1½ miles northeast of Clarence. Lower Kittanning bed. Sample cut in side entry, 1,000 feet from mine mouth, on May 31, 1913, by M. A. Pishel. Section at point of sampling is as follows:

Section of coal bed in Macon drift, Poormansite mine.

	Ft.	in.
Coal		8
Bone [1]		3
Coal	2	10
	3	9

17445. Semibituminous coal from Poormansite "High Coal" of Lehigh Valley Coal Co., 1½ miles northeast of Clarence. Lower Freeport bed. Sample cut in side entry, 600 feet from mine mouth, on May 31, 1913, by M. A. Pishel. Sample moist. Section at point of sampling is as follows:

Section of coal bed in Poormansite "High Coal" mine.

	Ft.	in.
Coal	2	7
Bone [1]		10
Coal	2	6
	5	11

17446F. Bituminous coal from mine No. 15 of Lehigh Valley Coal Co., one-half mile northeast of Gillintown. Lower Freeport bed. Sample cut in main entry, 500 feet from mine mouth, on May 31, 1913, by M. A. Pishel. Sample damp. Section at point of sampling is as follows:

Section of coal bed in mine No. 15.

	Ft.	in.
Bone [1]		10
Coal	1	6
Bone [1]		2
Coal	1	
	3	6

17447F. Bituminous coal from mine No. 22 of Lehigh Valley Coal Co., 1½ miles northwest of Clarence. Lower A bed. Sample cut in main entry, three-fourths of a mile from mine mouth, on May 31, 1913, by M. A. Pishel. Sample dry. Section at point of sampling is as follows:

Section of coal bed in mine No. 22.

	Ft.	in.
Coal, bony [1]		8
Fire clay [1]		5
Coal	3	2½
Clay [1]		1½
Coal		8
	5	1

CLEARFIELD COUNTY.

17441F. Bituminous (?) coal from Horseshoe mine of Potter, Bigler & Potter, one-half mile south of Karthaus. Lower Kittanning bed. Sample cut from room 3, second entry, 1,000 feet from mine

[1] Not included in sample.
[2] Parts sampled for No. 18127.
[3] Parts sampled for No. 18126.

[1] Not included in sample.

mouth, on June 2, 1913, by M. A. Pishel. Sample dry. Section at point of sampling is as follows:

Section of coal bed in Horseshoe mine.

	Ft.	in.
Coal, bony [1]		9
Coal	2	8
Pyrite [1]		½
Coal		5
	3	10½

17442F. Semibituminous coal from the Shinola mine of Shadock & Kelly at Karthaus. Bed A. Sample cut in main entry, 600 feet from mine mouth, on June 2, 1913, by M. A. Pishel. Sample dry. Section at point of sampling is as follows:

Section of coal bed in Shinola mine.

	Ft.	in.
Coal	1	6
Bone [1]		4
Coal	1	8
Bone [1]		5
	3	11

17443F. Bituminous coal from Eriton mine of Northwestern Mining & Exchange Co., 3½ miles south of Dubois. Lower Freeport bed. Sample cut in mine 200 feet southwest of shaft on June 5, 1913, by M. A. Pishel. Sample dry. Section at point of sampling is as follows:

Section of coal bed in Eriton mine.

	Ft.	in.
Coal, bony [1]	1	6
Coal	5	5
Shale [1]		1½
Coal		8
	7	8½

ELK COUNTY.

17455. Bituminous coal from Dagus mine of Northwestern Mining & Exchange Co., at Dagus. Lower Kittanning bed. Sample cut in room off face heading, first right entry (Fleming section), 1 mile from mine mouth, on June 4, 1913, by M. A. Pishel. Sample dry. Section at point of sampling is as follows:

[1] Not included in sample.

Section of coal bed in Dagus mine.

	Ft.	in.
Coal, bony [1]		1½
Coal, good	2	
Pyrite [1]		¼
Coal	1	6
	3	7¾

17456F. Bituminous coal from Byrnedale No. 31 mine of Shawmut Mining Co., at Byrnedale. Lower Kittanning bed. Sample cut in first left entry off main entry, 600 feet from mine mouth, on June 3, 1913, by M. A. Pishel. Section at point of sampling is as follows:

Section of coal bed in Byrnedale No. 31 mine.

	Ft.	in.
Coal, bony [1]		4
Coal	2	10
Pyrite [1]		½
Coal		4
	3	6½

17457. Bituminous coal from mine No. 1 of Dents Run Mining Co., at Wilmere. Lower Kittanning bed. Sample cut in fourth left entry, 600 feet from mine mouth, on June 3, 1913, by M. A. Pishel. Sample dry. Section at point of sampling is as follows:

Section of coal bed in mine No. 1.

	Ft.	in.
Coal, bony		10
Clay		1½
Coal		2
Clay		7
Coal [2]	2	7
	4	3½

17458. Bituminous coal from Elbon No. 5 mine of Shawmut Mining Co., at Brandy Camp. Lower Kittanning bed. Sample cut in first left entry, No. 4 drift, 1,000 feet from mine mouth, on June 4, 1913, by M. A. Pishel. Sample dry. Section at point of sampling is as follows:

[1] Not included in sample.
[2] Part sampled.

Section of coal bed in Elbon No. 5 mine.

	Ft.	in.
Coal	1	9
Mineral charcoal		½
Coal	1	2
	2	11½

JEFFERSON COUNTY.

17448F. Bituminous coal from West Clarion mine of Northwestern Mining & Exchange Co., 1 mile west of Brockwayville. Lower Freeport bed. Sample cut in second right entry, drift No. 8, 800 feet from mine mouth, on June 5, 1913, by M. A. Pishel. Sample represents 3 feet 4 inches of coal, entire thickness of bed. Sample dry.

17449F. Bituminous coal from West Clarion drift No. 14 of Northwestern Mining & Exchange Co., 1 mile west of Brockwayville, Upper Freeport bed. Sample cut in second room off main entry on June 5, 1913, by M. A. Pishel. Sample represents 2 feet 6 inches of coal, entire thickness of bed. Sample dry.

17450F. Bituminous coal from West Clarion No. 1 mine of Northwestern Mining & Exchange Co., 1 mile west of Brockwayville, Lower Kittanning bed. Sample cut in third right entry off first entry, face drift No. 1, 4,000 feet from mine mouth, on June 5, 1913, by M. A. Pishel. Sample represents 4 feet of coal, entire thickness of bed. Sample dry.

SOMERSET COUNTY.

17689. Semibituminous coal from mine of Perry Wyand, one-half mile south of Bakersville. Sample cut in mine 300 feet southwest of mouth on August 30, 1913, by J. H. Hance. Section at point of sampling is as follows:

Section of coal bed in mine of Perry Wyand.

	Ft.	in.
Shale [1]		2
Coal	1	8
Binder [1]		3
Coal		6
	2	7

[1] Not included in sample.

17690. Semibituminous coal from Ralphton No. 6 mine of Quemahoning Coal Co., at Zimmermantown. Upper Freeport (E) bed. Sample cut in mine 1,200 feet east of shaft on August 30, 1913, by J. H. Hance. Section at point of sampling is as follows:

Section of coal bed in Ralphton No. 6 mine.

	Ft.	in.
Coal	2	7
Binder [1]		1¾
Coal		4
Binder		1
Coal		4¼
	3	6

17691. Semibituminous coal from mine of Levi Berkey, 1¼ miles northwest of Edie. Upper Freeport (E) bed. Sample cut in mine 400 feet N. 60° W. of mouth on August 30, 1913, by J. H. Hance. Section at point of sampling is as follows:

Section of coal bed in Levi Berkey mine.

	Ft.	in.
Coal	2	11½
Binder [1]		1¼
Coal		4½
Binder [1]		½
Coal		7¼
	4	1

17692. Bituminous (?) coal from mine of Jake Miller, 1¾ miles southwest of Gillette. Sample cut in mine 500 feet northeast of mouth on August 30, 1913, by J. H. Hance. Section at point of sampling is as follows:

Section of coal bed in mine of Jake Miller.

	Ft.	in.
Coal	2	
Binder [1]		2
Coal		4½
Coal, dirty		5½
	3	

17693. Semibituminous coal from Neva mine of James McKelvey, three-fourths of a mile northeast of Somerset. Sample cut in mine 400 feet from mouth on

[1] Not included in sample.

August 29, 1913, by J. H. Hance. Section at point of sampling is as follows:

Section of coal bed in the Neva mine.

	Ft.	in.
Shale [1]		3
Coal	2	4
Binder [1]		1
Coal		3½
Binder [1]		¾
	3	¼

17694. Semibituminous coal from mine of Sanner & Sheffar, one-half mile southeast of Somerset. Unidentified bed. Sample cut in mine 300 feet from mouth on August 29, 1913, by J. H. Hance. Section at point of sampling is as follows:

Section of coal bed in Sanner & Sheffar mine.

	Ft.	in.
Bone [1]		3
Coal	2	8½
Binder [1]		5
Coal, dirty [1]		9
	4	1½

17695. Semibituminous coal from the Stauffer No. 2 mine of Myersdale Coal Co., 4½ miles northeast of Somerset. Lower Freeport (D) bed (?). Sample cut in mine 500 feet from mouth on August 29, 1913, by J. H. Hance. Section at point of sampling is as follows:

Section of coal bed in Stauffer No. 2 mine.

	Ft.	in.
Shale [1]		2
Coal	4	1½
	4	3½

17831. Bituminous coal from mine of Reuben Horner, 2 miles northwest of Boswell. Pittsburgh bed. Sample cut in mine 50 feet from mouth on September 29, 1913, by G. B. Richardson. Coal bed at the point sampled is 10 feet 6 inches thick. Sample represents lower 10 feet. Sample weathered.

17832. Semibituminous coal from mine of J. G. Berkey, 2 miles northwest of Boswell. Pittsburgh bed. Sample cut in mine 200 feet from mouth, on September 29, 1913, by G. B. Richardson. Coal bed at the point sampled is 4 feet 10 inches thick. Sample represents lower 3 feet 6 inches. Sample weathered.

[1] Not included in sample.

TIOGA COUNTY.

17451F. Semibituminous coal from New mine of Morris Run Coal Mining Co., at Morris Run. Morgan bed. Sample cut in fourth room, first entry, 1 mile from mine mouth, on May 27, 1913, by M. A. Pishel. Sample dry. Section at point of sampling is as follows:

Section of coal bed in New mine.

	Ft.	in.
Coal, bony [1]		6
Coal	2	8
	3	2

17452. Semibituminous coal from Bear Run mine of Blossburg Coal Co., one-half mile north of Landrus. Bloss bed. Sample cut in pillar in main entry 700 feet from mine mouth, on May 28, 1913, by M. A. Pishel. Section at point of sampling is as follows:

Section of coal bed in Bear Run mine.

	Ft.	in.
Coal	1	1½
Shale [1]		3
Coal, dirty [1]		10
Coal	1	2
Pyrite (lens)[1]		3
Coal		6
	4	1½

17453. Semibituminous coal from Anna S. mine of Fall Brook Coal Co., one-half mile west of Antrim. Bloss bed. Sample cut in room off side entry 1 mile from mine mouth, on May 29, 1913, by M. A. Pishel. Section at point of sampling is as follows:

Section of coal bed in Anna S mine.

	Ft.	in.
Coal	1	11
Bone [1]		3
Coal	1	0
Bone [1]		5
Coal		10
	4	5

[1] Not included in sample.

17454F. Semibituminous coal from New mine of Morris Run Coal Mining Co., at Morris Run. Bloss bed. Sample cut in Sterling heading, 3 miles from mine mouth, on May 27, 1913, by M. A. Pishel. Sample dry. Section at point of sampling is as follows:

Section of coal bed in New mine.

	Ft.	in.
Coal, bony [1]		7
Coal, good	2	5
	3	

WESTMORELAND COUNTY.

17901F. Bituminous coal from mine of John Dyer, 3 miles southeast of Ligonier. Upper Freeport bed. Sample cut in end of entry, 200 feet from mine mouth, on October 15, 1913, by G. B. Richardson. Section at point of sampling is as follows:

Section of coal bed in mine of John Dyer.

	Ft.	in.
Coal	2	1
Shale [1]		1
Coal		4
Shale [1]		1
Coal		4
	2	11

UTAH.

CARBON COUNTY.

17604F. Bituminous coal from No. 3 mine of Utah Fuel Co., in the SW. ¼ SW. ¼ sec. 4, T 15 S., R. 14 E., 1 mile southeast of Sunnyside. Lower bed. Sample cut in face of second left entry in dips, about 150 feet within room 1, 1 mile northeast of mine mouth, on August 5, 1913, by F. R. Clark. Sample dry. Section at point of sampling is as follows:

Section of coal bed in No. 3 mine.

	Ft.	in.
Coal [1]	1	
Coal	6	10
Coal [1]	2	
	9	10

17605. Bituminous coal, same as No. 17604F. Sample cut in face of room 5 off second right entry, about 1 mile south of mine mouth. Sample represents 5 feet 4 inches of coal, entire thickness of bed. Sample dry.

GRAND COUNTY.

17577F. Bituminous coal from mine No. 1-A of American Fuel Co., of Utah, in the NW. ¼ sec. 27, T. 20 S., R. 20 E., 5 miles north of Thompson; middle bed of Bear coal. Sample cut in face of main entry, 1,200 feet east slightly southeast of mine mouth, on July 17, 1913, by F. R. Clark. Sample dry. Section at point of sampling is as follows:

Section of coal bed in No. 1-A mine.

	Ft.	in.
Coal	1	3
Coal, bony	1	1
Coal	1	
Shale		½
Coal	1	2
Bone		1
Coal	1	1
	5	8½

17578. Bituminous coal from prospect of American Fuel Co. of Utah, in SE. ¼ NW. ¼ sec. 27, T. 20 S., R. 20 E., 5 miles north of Thompson. Lower bed of Bear coal. Sample cut in face of prospect, 85 feet east from mouth, on July 17, 1913, by F. R. Clark. Sample dry and probably slightly weathered. Section at point of sampling is as follows:

Section of coal bed in prospect.

	Ft.	in.
Coal [1]		10
Clay [1]		5
Coal	4	3½
	5	6½

SANPETE COUNTY.

17715. Bituminous coal from Coal Creek mine of Johnny Reese in SE. ¼ NE. ¼ sec. 14, T. 16 S., R. 2 E., 6 miles northwest of Ephraim. Sample cut in mine 300 feet N. 24° E. of mouth on September 4, 1913, by F. R. Clark. Sample dry. Section at point of sampling is as follows:

[1] Not included in sample.

[1] Not included in sample.

Section of coal bed in Coal Creek mine.

	Ft.	in.
Coal, bright		5
Coal, dull		5
Coal, bright		2
Coal, dull		8
Bone [1]		11
	2	7

17717. Bituminous coal from abandoned mine ("north tunnel") in NE. ¼ SE. ¼ sec. 2, T. 16 S., R. 2 E., 3½ miles southwest of Wales. North tunnel bed. Sample cut beyond zone of weathering, 300 feet N. 5° E. of mine mouth, on September 9, 1913, by F. R. Clark. Sample wet. Section at point of sampling is as follows:

Section of coal bed in North Tunnel mine.

	Ft.	in.
Coal	1	3
Shale [1]	1	10
Coal		3
Shale [1]		1½
Coal		4
Shale [1]		1
Coal		6
Shale [1]		6
Coal	1	1
Bone [1]		3
	6	2½

17718. Bituminous coal from mine of Henry Thomas (Old Canyon) in N. ½ NE. ¼ sec. 35, T. 15 S., R. 2 E., 2 miles west of Wales. Sample cut from face of room 6, 1,400 feet north of mine mouth, on September 9, 1913, by F. R. Clark. Sample fresh and dry. Section at point of sampling is as follows:

Section of coal bed in mine of Henry Thomas.

	Ft.	in.
Coal	1	6
Bone		¾
Coal		5½
Bone		½
Coal	1	2½
Bone [1]		8
Coal [1]		2
Shale [1]	1	2
Coal (not mined).[1]		
	5	3¼+

[1] Not included in sample.

VIRGINIA.

DICKENSON COUNTY.

17559. Bituminous coal from Nora Mills mine of Clinchfield Coal Corporation at Nora. Widow Kennedy coal bed. Sample cut 300 feet east of drift mouth on July 12, 1913, by Henry Hinds. Sample includes entire bed. Sample wet. Section at point of sampling is as follows:

Section of coal bed in Nora Mills mine.

	Ft.	in.
Coal		6⅜
Bone		¼
Coal	1	3
"Rash"		⅛
Coal		3¾
"Rash"		¼
Coal		2⅝
"Rash"		⅛
Coal		4
	2	8½

17560. Bituminous coal from same mine as No. 17559. Sample wet. The section of the coal bed at point sampled, 300 feet northeast of drift mouth, is as follows:

Section of coal bed in Nora Mills mine.

	Ft.	in.
Coal		5½
Bone		⅛
Coal		6¼
Shale [1]		1¾
Coal		5¾
Bone		¼
Coal		8
	2	3⅝

17561F. Bituminous coal. Composite of Nos. 17559 and 17560.

17743. Bituminous coal from mine of Yellow Poplar Lumber Co., 4 miles northwest of Prater, Buchanan County. Upper Banner (?) coal bed. Sample cut in mine 200 feet from mouth on September 17, 1913, by T. K. Harnsberger. Sample dry. Section at point of sampling is as follows:

Section of coal bed in Yellow Poplar Lumber Co. mine.

	Ft.	in.
Coal, pyritiferous [1]		8
Shale [1]		7
Coal		3

[1] Not included in sample.

	Ft.	in.
"Rash"		⅛
Coal		9½
Bone [1]		1
Coal	1	1½
Sandstone [1]		1½
Coal	1	3
	4	10⅝

17744. Bituminous coal from same mine as No. 17743. Sample dry. Section at point of sampling, 220 feet N. 85° E. of mine mouth, is as follows:

Section of coal bed in Yellow Poplar Lumber Co. mine.

	Ft.	in.
Coal, pyritiferous [1]		9½
Shale [1]		6½
Coal		3
"Rash"		¼
Coal		8⅛
Bone [1]		1
Coal	1	2⅞
Sandstone [1]		1
Coal	1	3½
	4	11¾

17751. Bituminous coal from mine of C. C. Owens, 1 mile northeast of Mart. Splash Dam coal bed. Sample cut 10 feet north of main drift, 75 feet east of mine mouth, on September 19, 1913, by T. K. Harnsberger. Sample dry, coal slightly weathered. Section at point of sampling is as follows:

Section of coal bed in C. C. Owens's mine.

	Ft.	in.
Coal		8½
"Rash"		¼
Coal		11
Shale		¼
Coal		2
Shale [1]		1¼
Coal		7½
	2	6¾

17752. Bituminous coal from same mine as No. 17751. Sample dry, coal slightly weathered. Section at point of sampling, 15 feet south of main entry and 75 feet east of mine mouth, is as follows:

[1] Not included in sample.

Section of coal bed in C. C. Owens' mine.

	Ft.	in.
Coal	1	8
Shale [1]		¼
Coal		2
Shale [1]		1
Coal		3½
Shale and pyrite		¼
Coal		4
	2	7¼

RUSSELL COUNTY.

18121F. Bituminous coal from mine No. 103 of Clinchfield Coal Corporation, Widow Kennedy bed. Sample cut in mine 260 feet N. 55° W. of mouth on November 17, 1913, by T. K. Harnsberger. Sample represents 5 feet 2 inches of coal, entire thickness of bed.

18122. Bituminous coal from mine No. 52 of Clinchfield Coal Corporation, Lower Banner bed. Sample cut 325 feet northeast of mouth of No. 0 drift on November 17, 1913, by T. K. Harnsberger. Sample represents 3 feet of coal, entire thickness of bed.

18123. Bituminous coal from same mine as No. 18122. Sample cut 1,700 feet southwest of mouth of No. 1 drift. Section at point of sampling is as follows:

Section of coal bed in mine No. 52.

	Ft.	in.
Coal	2	6½
Coal and shale [1]		2
	2	8½

18124F. Bituminous coal. Composite of samples Nos. 18122 and 18123.

18128. Bituminous coal from No. 2 mine of Clinchfield Coal Corporation. Upper Banner bed. Sample cut 2,400 feet S. 18° E. of mouth of drift No. 3 on November 18, 1913, by T. K. Harnsberger. Section at point of sampling is as follows:

Section of coal bed in No. 2 mine.

	Ft.	in.
Coal	1	10
Sandstone [1]		1½
Coal	1	2½
Sandstone [1]		½
Coal	2	5
	5	7½

[1] Not included in sample.

18129. Bituminous coal from same mine as No. 18128. Sample cut 2,750 feet S. 78° E. of mouth of drift No. 5, tunnel line. Section at point of sampling is as follows:

Section of coal bed in No. 2 mine.

	Ft.	in.
Coal	1	4
Sandstone [1]		1
Coal	1	2
Shale [1]		1
Coal	1	6
	4	2

18130. Bituminous coal from same mine as No. 18128. Sample cut 3,400 feet S. 85° W. of mouth of drift No. 1, middle incline. Section at point of sampling is as follows:

Section of coal bed in No. 2 mine.

	Ft.	in.
Coal	1	6
Sandstone [1]		1
Coal	1	5
Sandstone [1]		1
Coal	1	10
	4	11

18131F. Bituminous coal. Composite of samples 18128, 18129, and 18130.

18235. Bituminous coal from mine No. 6 of Clinchfield Coal Corporation, at Wilder. Upper Banner coal bed. Sample cut 3,000 feet S. 71° W. of mouth of No. 1 opening on November 25, 1913, by T. K. Harnsberger. Section at point of sampling is as follows:

Section of coal bed in mine No. 6.

	Ft.	in.
Coal	1	6
Sandstone [1]		1
Coal	1	6¾
Shale [1]		1
Coal	2	2
Shale [1]		3¼
Coal	1	1½
	6	9½

18236. Bituminous coal from same mine as No. 18235. Sample cut in room 5, 1,250 feet S. 35° E. of No. 3 opening, on November 26, 1913. Section at point of sampling is as follows:

Section of coal bed in mine No. 6.

	Ft.	in.
Coal	1	2
Sandstone [1]		1
Coal	1	6¼
Coal and shale [1]		4¼
Coal		4¼
Shale [1]		½
Coal	1	5
Coal and shale [1]		6
Coal		8½
	6	1¾

18237. Bituminous coal from same mine as No. 18235. Sample cut 4,000 feet S. 10° W. of No. 3 opening. Section at point of sampling is as follows:

Section of coal bed in mine No. 6.

	Ft.	in.
Coal	1	7
Sandstone [1]		1
Coal	1	8½
Shale [1]		1
"Rash" [1]		4½
Coal	1	11
"Rash" and clay [1]		6
Coal	1	5
	7	8

18238. Bituminous coal. Composite of samples Nos. 18235, 18236, and 18237.

18239. Bituminous coal from mine No. 201 of Clinchfield Coal Corporation, 1 mile northeast of Slemp. Bed No. 4. Sample cut 5,200 feet N. 33° W. of shaft on November 26, 1913, by T. K. Harnsberger. Section at point of sampling is as follows:

Section of coal bed in mine No. 201.

	Ft.	in.
"Rash" [1]		9
Coal	2	
Sandstone [1]		3
Coal	3	1
	6	1

[1] Not included in sample.

[1] Not included in sample.

18240. Bituminous coal from same mine as No. 18239. Sample cut 1,600 feet N. 68° W. of shaft. Section at point of sampling is as follows:

Section of coal bed in mine No. 201.

	Ft.	in.
Coal	1	9½
Shale [1]		5
Coal	2	3
	4	5½

18241. Bituminous coal from same mine as No. 18239. Sample cut 2,900 feet N. 27° W. of shaft. Section at point of sampling is as follows:

Section of coal bed in mine No. 201.

	Ft.	in.
Coal	1	4½
Shale [1]		3½
Coal	2	3
	3	11

18242. Bituminous coal. Composite of samples Nos. 18239, 18240, and 18241.

18243. Bituminous coal from mine No. 55 of Clinchfield Coal Corporation, at Wilder. Lower Banner coal bed. Sample cut 900 feet S. 60° W. of No. 3 opening on November 25, 1913, by T. K. Harnsberger. Section at point of sampling is as follows:

Section of coal bed in mine No. 55.

	Ft.	in.
Coal	3	4
"Rash" [1]		3½
	3	7½

18244. Bituminous coal from same mine as No. 18243. Sample cut 2,500 feet S. 35° E. of No. 5 opening. Section at point of sampling is as follows:

Section of coal bed in mine No. 55.

	Ft.	in.
Coal		7
"Rash" [1]		2
Sandstone [1]	1	9
Coal	3	5
"Rash" [1]		7
	6	6

[1] Not included in sample.

18245. Bituminous coal from same mine as No. 18243. Sample cut 1,300 feet N. 35° W. of No. 2 opening. Section at point of sampling is as follows:

Section of coal bed in mine No. 55.

	Ft.	in.
"Rash" [1]		½
Coal	3	6
"Rash" [1]		4
	3	10½

18246. Bituminous coal. Composite of samples Nos. 18243, 18244, and 18245.

WISE COUNTY.

18226. Bituminous coal from Cranesnest No. 1 mine of Clinchfield Coal Corporation, near Caney (Dickenson County). Upper Banner coal bed. Sample cut 1,500 feet southwest of entrance to main entry on November 22, 1913, by T. K. Harnsberger. Section at point of sampling is as follows:

Section of coal bed in Cranesnest No. 1 mine.

	Ft.	in.
Coal		1½
Sandstone [1]		½
Coal	2	
Sandstone [1]		1
Coal	1	7½
Coal and shale [1]		2½
Coal		3½
Shale [1]		4
Coal		2
Shale [1]		1¾
Coal		10
	5	10¼

18227. Bituminous coal from same mine as No. 18226. Sample cut 500 feet

[1] Not included in sample.

northeast of mine mouth. Section at point of sampling is as follows:

Section of coal bed in Cranesnest No. 1 mine.

	Ft.	in.
Coal	1	10
Sandstone [1]		1
Coal	2	2
	4	1

18228. Bituminous coal from same mine as No. 18226. Sample cut 4,100 feet southeast of entrance to main entry. Section at point of sampling is as follows:

Section of coal bed in Cranesnest No. 1 mine.

	Ft.	in.
Coal	2	10
Sandstone [1]		1
Coal	1	5¾
Shale		¼
Coal		3
Shale [1]		5
Coal		6
Shale		⅛
Coal		9½
	6	4⅝

18229F. Bituminous coal. Composite of samples Nos. 18226, 18227, and 18228.

WEST VIRGINIA.

McDOWELL COUNTY.

17469. Semibituminous coal from mine of Central West Coal Co., 8 miles south of Iaeger. Pocahontas No. 5 bed. Sample cut in mouth of dip entry off main entry, 500 feet from mine mouth, on June 7, 1913, by Eugene Stebinger. Sample dry. Section at point of sampling is as follows:

Section of coal bed of Central West mine.

	Ft.	in.
Coal, lustrous		4
Coal, laminated		7
Coal, splint		11
Coal, lustrous	1	6
	3	4

17470. Semibituminous coal from same mine as No. 17469. Sample cut in second left entry off main entry, 1,500 feet from mine mouth. Sample dry. Section at point of sampling is as follows:

Section of coal bed of Central West mine.

	Ft.	in.
Coal, lustrous		3
Coal, fine-grained		4
Coal, splint	1	5
Coal, lustrous	1	1
	3	1

17471F. Semibituminous coal. Composite of samples Nos. 17469 and 17470.

MINGO COUNTY.

17462. Bituminous coal from Winifrede mine of Williamson Coal & Coke Co., 1 mile east of Williamson. Winifrede bed. Sample cut 700 feet northeast of mine mouth on May 31, 1913, by Eugene Stebinger. Sample dry. Section at point of sampling is as follows:

Section of coal bed in Winifrede mine.

	Ft.	in.
Coal, splint	2	4
Coal, bony		4
Coal, splint	1	1
Clay [1]		2
Coal, splint	1	9
	5	8

17463. Bituminous coal from Buffalo mine of Buffalo Collieries Co., 1 mile northeast of Chataroy. Winifrede bed. Sample cut in room 1 on right, off drift No. 12, 500 feet from mine mouth, on May 30, 1913, by Eugene Stebinger. Sample dry. Section at point of sampling is as follows:

Section of coal bed in Buffalo mine.

	Ft.	in.
Coal, splint	3	1
Coal, bony [1]		4
Coal, splint	2	
	5	5

17464. Bituminous coal from the mine of E. L. Sternberger Coal Co., 1½ miles northeast of Williamson. Winifrede bed. Sample cut in room 2 on left, off shop entry, 900 feet from mine mouth, on May 29, 1913, by Eugene Stebinger. Sample dry. Section at point of sampling is as follows:

[1] Not included in sample.

[1] Not included in sample.

Section of coal bed in Winifrede mine.

	Ft.	in.
Coal, splint	2	7
Coal, bony		3½
Coal, splint		5
Coal, lustrous		7
Clay [1]		10
Coal, splint	1	6
Coal, lustrous		5
	6	7½

17465F. Bituminous coal. Composite of samples Nos. 17462, 17463, and 17464.

17466. Bituminous coal from mine of Howard, Jr., Coal Co., 2 miles northeast of Chataroy. Coalburg bed. Sample cut in first air course on main entry, 700 feet from mine mouth, on May 30, 1913, by Eugene Stebinger. Sample dry. Section at point of sampling is as follows:

Section of coal bed in Howard mine.

	Ft.	in.
Coal, splint	3	3
Bone [1]		3
Coal, lustrous, hard		11
Bone [1]		1
Coal, lustrous		6
Bone [1]		1
Coal, lustrous		7
	5	8

17467. Bituminous coal from Buffalo mine of Buffalo Collieries Co., 1 mile northeast of Chataroy. Coalburg bed. Sample cut in room 3 on left off main entry, 700 feet from mine mouth, on May 30, 1913, by Eugene Stebinger. Sample dry. Section at point of sampling is as follows:

Section of coal bed in Buffalo mine.

	Ft.	in.
Coal, dull, hard	1	4
Clay [1]		1
Coal, lustrous, soft		6
Clay [1]		1
Coal, dull, hard		9
Bone [1]		4
Coal, splint		9
Bone [1]		2
Coal, lustrous, soft	1	
	5	

17468F. Bituminous coal. Composite of samples 17466 and 17467.

17472F. Bituminous coal from mine of White Star Mining Co., 3 miles northwest of Matewan. Alum bed. Sample cut in third left entry off main entry, 1,000 feet from mine mouth, on June 3, 1913, by Eugene Stebinger. Sample represents 3 feet 4 inches of coal, entire thickness of bed. Sample dry.

17473F. Bituminous coal from mine of White Star Mining Co., 3 miles northwest of Matewan. No. 2 or Gas bed. Sample cut at heading of main entry, 700 feet from mine mouth, on June 3, 1913, by Eugene Stebinger. Sample dry. Section at point of sampling is as follows:

Section of coal bed in White Star mine.

	Ft.	in.
Coal, splint		4
Bone [1]		9
Coal, lustrous	2	6
Coal, splint		8
	4	3

17474F. Bituminous coal from mine of Red Jacket, Jr., Coal Co., 4 miles northeast of Matewan. Red Jacket bed. Sample cut in room 15 on left off main entry, 1,200 feet from mine mouth, on June 2, 1913, by Eugene Stebinger. Sample dry. Section at point of sampling is as follows:

Section of coal bed in Red Jacket, Jr., mine.

	Ft.	in.
Coal, lustrous		8
Coal, splint	1	8
Coal, banded		3
Coal, bony		2
Coal, lustrous	1	3
	4	

17475F. Bituminous coal from War Eagle mine of War Eagle Coal Co., 3 miles northeast of War Eagle. War Eagle No. 2 bed. Sample cut in first room on right off main entry, 200 feet from mine mouth,

[1] Not included in sample.

[1] Not included in sample.

on June 6, 1913, by Eugene Stebinger. Sample dry. Section at point of sampling is as follows:

Section of coal bed in War Eagle mine.

	Ft.	in.
Coal, laminated		7
Coal, lustrous	2	9
Coal, bony		2
Coal, lustrous	2	8
	6	2

17476. Bituminous coal from Papoose mine of War Eagle Coal Co., 2 miles east of War Eagle. War Eagle No. 1 bed. Sample cut in fifth left entry off main straight entry, 600 feet from mine mouth, on June 6, 1913, by Eugene Stebinger. Sample dry. Section at point of sampling is as follows:

Section of coal bed in Papoose mine.

	Ft.	in.
Coal, lustrous, with sulphur streaks		5
Clay [1]		½
Coal, lustrous		9
Coal, splint		8
Coal, lustrous		9
Clay [1]		2
Coal, lustrous	2	10
	5	7½

17477. Bituminous coal from same mine as No. 17476. Sample cut at heading No. 5 drift, 1,200 feet from mine mouth. Sample dry. Section at point of sampling is as follows:

Section of coal bed in Papoose mine.

	Ft.	in.
Coal, lustrous	1	1
Coal, splint		11
Clay [1]		5
Coal, lustrous		4
Coal, splint		9
Coal, lustrous	2	7
	6	1

17478. Bituminous coal from Mephisto mine of War Eagle Coal Co., 3 miles northeast of War Eagle, War Eagle No. 1 bed. Sample cut at heading of second left air course, 500 feet from mine mouth, on June 6, 1913, by Eugene Stebinger. Sample dry. Section at point of sampling is as follows:

Section of coal bed in Mephisto mine.

	Ft.	in.
Coal, soft	2	7
Clay [1]		6
Coal, hard	1	
Coal, soft	2	
	6	1

17479F. Bituminous coal. Composite of samples 17476, 17477, and 17478.

17480. Bituminous coal from Buffalo mine of Buffalo Collieries Co., 1 mile east of Chataroy. Thacker bed. Sample cut in prospect entry 60 feet in on May 30, 1913, by Eugene Stebinger. Sample wet. Section at point of sampling is as follows:

Section of coal bed in Buffalo mine.

	Ft.	in.
Coal, lustrous	2	7
Clay [1]		4
Coal, under water [1]		6
	3	5

17481. Bituminous coal from Winifrede mine of Williamson Coal & Coke Co., 1 mile east of Williamson. Thacker bed. Sample cut in new prospect drift 60 feet in on May 31, 1913, by Eugene Stebinger. Sample dry. Section at point of sampling is as follows:

Section of Thacker coal bed in Winifrede mine.

	Ft.	in.
Coal, dull		7
Clay [1]		½
Coal, lustrous	2	4
Clay [1]		1
Coal, lustrous		8
	3	8½

17483. Bituminous coal from mine of Red Jacket, Jr., Coal Co., 4 miles northeast of Matewan. Thacker bed. Sample cut in room 15 on left off main entry, 1,200 feet from mine mouth, on June 2, 1913, by

[1] Not included in sample.

[1] Not included in sample.

Eugene Stebinger. Sample dry. Section at point of sampling is as follows:

Section of coal bed in Red Jacket, Jr., mine.

	Ft.	in.
Coal, lustrous	1	4
Coal, splint		8
Coal, lustrous	2	3
	4	3

WYOMING.

CONVERSE COUNTY.

17657. Subbituminous coal from mine of Fairview Coal Co., in NE. ¼ sec. 5, T. 33 N., R. 75 W., at Glenrock. Sample cut in mine 200 feet northeast of shaft on August 15, 1913, by J. B. Reeside, jr. Sample wet. Section at point of sampling is as follows:

Section of coal bed in Fairview Coal Co. mine.

	Ft.	in.
Coal	1	4
Shale [1]		2
Coal	5	
	6	6

17658. Subbituminous coal from mine of Glenrock Coal Co., in NE. ¼ SW. ¼ sec. 4, T. 33 N., R. 75 W., one-fourth mile east of Glenrock. Sample cut in mine 75 feet N. 34° E. of main entry on August 15, 1913, by J. B. Reeside, jr. Sample dry. Section at point of sampling is as follows:

Section of coal bed in mine of Glenrock Coal Co.

	Ft.	in.
Coal		11
Bone		4
Shale		2
Coal [2]	5	4
	6	9

17722F. Subbituminous coal from mine of Big Muddy Consolidated Coal Co., in SE. ¼ sec. 26, T. 34 N., R. 77 W., at Big Muddy. Upper Big Muddy bed. Sample cut 300 feet down slope on September 12, 1913, by J. B. Reeside, jr. Sample fresh and dry. Section at point of sampling is as follows:

[1] Not included in sample.
[2] Part sampled.

Section of coal bed in mine of Big Muddy Consolidated Coal Co.

	Ft.	in.
Coal	4	
Bone [1]		1
	4	1

17723F. Subbituminous coal from mine of Big Muddy Consolidated Coal Co., in NW. ¼ sec. 36, T. 34 N., R. 77 W., at Big Muddy. Lower Big Muddy bed. Sample cut in mine 40 feet from mouth of unused slope on September 12, 1913, by J. B. Reeside, jr. Sample represents 4 feet 3 inches of coal, entire thickness of bed. Sample dry, hard, and unweathered.

17902. Subbituminous coal from a prospect in SE. ¼ sec. 9, T. 33 N., R. 75 W., 2 miles south of Glenrock. Sample cut in prospect 40 feet from mouth, on October 15, 1913, by J. B. Reeside, jr. Sample dry Section at point of sampling is as follows:

Section of coal bed in prospect.

	Ft.	in.
Bone [1]		4
Coal	3	
	3	4

FREMONT COUNTY.

17584. Subbituminous coal from prospect in sec. 25, T. 42 N., R. 108 W., 8 miles northwest of Dubois. Sample cut 10 feet from mouth of prospect by D. Dale Condit. Sample wet and weathered. Section point of sampling is as follows:

Section of coal bed in prospect.

	Ft.	in.
Clay with lenses of coal	2	6
Coal		3
Clay	1	5
Coal [2]		10
Shale, gypsiferous		½
Coal [2]	1	1
Coal, bony		2
Coal [2]		7½
Clay	1	7
Coal		6½
Clay		4
Coal		2½

[1] Not included in sample.
[2] Part sampled.

	Ft.	in.
Clay		4
Coal		5½
	10	4½

HOT SPRINGS COUNTY.

17709. Subbituminous coal from mine of Vede Putney, in sec. 24, T. 44 N., R. 99 W. Putney bed. Sample cut at face of room, 70 feet S. 65° W. from a point in the main entry 80 feet from the mouth, on August 27, 1913, by D. F. Hewett. Sample weathered (?). Section at point of sampling is as follows:

Section of coal bed in mine of Vede Putney.

	Ft.	in.
Coal	1	1
Coal, bony		3
Coal	2	1
Shale [1]		1
Coal [1]		4
Shale [1]		3
Coal [1]		6
	4	7

17830. Subbituminous coal from prospect of E. L. Gwynn in sec. 1, T. 45 N., R. 99 W. Bed B. Sample cut in prospect 40 feet from mouth and 30 feet west on September 15, 1913, by D. F. Hewett. Section at point of sampling is as follows:

Section of coal bed in prospect of E. L. Gwynn.

	Ft.	in.
Coal	1	2
Shale		6
Coal		2
Shale		1
Coal		1
Shale		5
Coal [2]	4	
Shale	1	6
Coal		4
	8	3

[1] Not included in sample.
[2] Part sampled.

17731. Subbituminous coal from Owl Creek mine of Berry Bros. in sec. 28, T. 44 N., R. 98 W. Sample cut in south wall of entry, 40 feet from mine mouth, on August 27, 1913, by D. F. Hewett. Section at point of sampling is as follows:

Section of coal bed in Owl Creek mine.

	Ft.	in.
Coal		3
Shale		2
Coal		4
Shale		2
Coal [1]	2	11
	3	10

NATRONA COUNTY.

17778. Subbituminous coal from prospect in SE. ¼ sec. 22, T. 33 N., R. 78 W., 7 miles southeast of Casper. Sample cut in prospect 40 feet from mouth on September 22, 1913, by J. B. Reeside, jr. Sample dry; weathered (?). Section at point of sampling is as follows:

Section of coal bed in prospect.

	Ft.	in.
Coal	2	
Bone [2]		3
	2	3

17895. Subbituminous coal from prospect in the SW. ¼ sec. 13, T. 36 N., R. 79 W., 5 miles north of Casper. Sample cut 20 feet in prospect on October 12, 1913, by J. B. Reeside, jr. Sample weathered (?). Section at point of sampling is as follows:

Section of coal bed in prospect.

	Ft.	in.
Bone		½
Coal	2	3
Bone [2]		5
	2	8½

[1] Part sampled.
[2] Not included in sample.

INDEX.

A. Page.

Alabama, coals of, analyses of..... 496
coals of, description of..... 508
Allegheny formation, occurrence and character of..... 10
Ames or "Crinoidal" member, occurrence and character of..... 10
Amsterdam, Ohio, coal near..... 10
oil pools in..... 15–17
Anderson, M. J., work of..... 400
Arkansas, gas in. *See* Fort Smith-Poteau gas field.
Ashley, G. H., on Rhode Island anthracite. 155–162
work of..... 400
Atoka formation, occurrence and character of 24–25
oil found in..... 25

B.

Backbone anticline, location and character of. 26–27
Backbone fault, occurrence and character of. 29
Barnett, V. H., on Douglas oil and gas field, Wyo..... 49–88
Barstow-Kramer region, Cal., geography of.. 142
geologic mapping of..... 141–142
geology of..... 144–151
previous knowledge of..... 143
oil, conclusions as to presence of oil in..... 141, 152–154
wells drilled for..... 151–152
paper on..... 141–154
reconnaissance map of..... 152
structure of..... 151
topography of..... 142–143
Bassler, Harvey, work of..... 338, 356
Bauer, C. M., on lignite in vicinity of Plentywood and Scobey, Mont..... 293–315
Bearpaw shale, occurrence and character of..... 348, 363–364
Benton shale, faults cutting sandstone in, figure showing..... 68
fossils from..... 62
occurrence and distribution of..... 62
section showing structure of..... 62
Berea sand, character of, in Cadiz quadrangle, Ohio 12, 13, 14
Big Injun sand, character of sandstone in.... 10
location of..... 10
Big Sandy coal field, Mont., access to..... 357
coal beds in, development of..... 367–378
coal in, analyses of samples of..... 376
occurrence of..... 366–372
properties of..... 372–377
geologic map of..... 372
explanation of..... 357
geology of..... 358–366
paper on..... 365–378
sections of coal beds in, figure showing... 373

Page.

Big Sandy coal field, Mont., structure of..... 366
topography of..... 358
Biswell Hill anticline, location and character of..... 27
Boggy shale, occurrence and character of.... 25
Bokoshe syncline..... 29
Bolling coal beds, Virginia, occurrence and character of..... 196–199
Book Cliffs coal field, Utah, location of..... 453
Boone limestone, depth of, in Glenn pool, Okla..... 41
occurrence and character of 37
Bowen, C. F., on Big Sandy coal field, Mont..... 356–378
on Cleveland coal field, Mont..... 338–355
on coal discovered between Musselshell and Judith, Mont..... 329–337
Buck Knob anticline, locality and character of..... 182–183
Butts, Charles, on coal resources of Pound quadrangle, Va.–Ky..... 165–221

C.

Cadiz Junction, Ohio, wells near..... 14
Cadiz quadrangle, Ohio, northern part of, field work in 9
geology of..... 10–14
location of..... 9
map of..... 9
oil and gas sands in..... 12
structure of..... 13
oil pools in..... 15–17
paper on oil and gas in..... 9–17
salt-water saturation of sand in..... 14–15
wells in, records of..... 11
Campbell, M. R., analyses of coal samples from various fields..... 491–526
introduction by..... 7
on coking coal in Powell Mountain, Va. 163–164
work of..... 244, 399, 400
Cannonball marine member, occurrence and character of..... 249–250
Cannonball River lignite field, N. Dak., agriculture of..... 247
commercial relations of..... 245–246
field work in..... 244–245
geography of..... 245–246
geologic map of central part of..... 290
geologic map of western part of..... 282
geology of..... 246–252
lignite beds in eastern part of..... 290–291
lignite in, analyses of samples of..... 256–258
chemical composition of..... 255–261
description of, by townships..... 263–290
distribution of..... 252–254
mining of..... 261–263

Page.

Cannonball River lignite field, N. Dak., lignite in, physical properties of. 254
lignite in, tests on samples of. 260
location and extent of. 243-244
map of North Dakota showing. 243
paper on. 243-291
previous publications on. 245
topography of. 246
California, reconnaissance of Barstow-Kramer region. 141-154
Casper formation, fossils from. 56-57
occurrence and character of. 55-56
sections showing structure of. 56
Cavanal syncline, location and character of. 28
Cherokee shale, occurrence and character of. 39-40, 230
Choctaw fault, occurrence and character of. 29
Chugwater formation, occurrence and character of. 59
Claggett formation, occurrence and character of. 344, 361-362
Clark, B. W., work of. 244
Clark, F. R., on coal near Thompson, Utah. 453-477
on coal near Wales, Utah. 478-489
Clark, G. W., work of. 478
Clark, H., work of. 453
Cleveland coal field, Mont., coal in, analyses of samples of. 354
coal in, development of. 355
occurrence and distribution of. 349-351
properties of. 351-355
geography of. 339
geologic map of. 350
explanation of. 339
geology of. 340-349
location of. 338
map showing. 294
paper on. 338-355
"Cloverly" formation, occurrence and character of. 61, 95-96
section showing structure of. 96
Coal and lignite, papers on. 155-526
Coal, classification of. 494-495
miscellaneous samples of. 491-494
analyses of. 496-507
description of. 508-526
See also particular districts, places, etc.
Collier, A. J., work of. 23
Colorado, coals of, analyses of. 496-497
description of. 508-510
Colorado shale, correlation of. 107-108
fossils from. 64-65, 99
occurrence and character of. 62-63, 96-99, 342-343
sections showing structure of lower and middle members of. 97-98
Condit, D. D., on oil and gas in Cadiz quadrangle, Ohio. 9-17
Custer, Mont., coal fields southwest of, access to. 317
coal fields southwest of, coal bed in, map showing. 325
coal in. 323
occurrence and character of. 323-327
quality of. 327-328
quantity of. 328
development in, outlook for. 328

Page.

Custer, Mont., coal fields southwest of, field work in. 317
coal fields southwest of, geology and coal resources of, paper on. 316-328
geology of. 319-323
map of, and sections of coal. 326
structure of. 321-323
topography of. 317-319

D.

Dakota sandstone, occurrence and character of. 128, 431
Davies, R. G., work of. 142
Dayton oil field, N. Mex., development of. 135-137
geology of. 137-139
location of, sketch map showing. 135
oil in, analyses of. 137
discovery of. 135
occurrence of. 139
well in, log of. 138
Douglas oil and gas field, Wyo., discovery of oil in. 49-50
faults cutting sandstone in Benton shale. 68
field work in. 51-52
fossil plants from. 66
future development of. 88
gas in, analyses of. 71-72
character of. 71
geology of. 53-68
igneous rocks in. 67
land surveys in. 52-53
location of. 49
index map showing. 49
map of. 88
oil and gas in, occurrence of. 68-69
oil in, analyses of. 71
character of. 70-71
origin of. 72
production of. 88
paper on. 49-88
structure of. 67-68
topography of. 53
vegetable, fuel, and water supply of. 50
wells and well logs in, details of. 74-87
interpretation of. 74
wells in. 73-74

E.

Eagle sandstone, coal in. 334-335, 367-369
occurrence and character of. 343-344, 359-360
Eden Ridge coal field, Oreg., access to. 399
coal beds in, local features of. 406-410
coal in, chemical analyses of. 411-418
distribution of. 404-406
general character of. 404
quality of. 406
tests of, results of. 417
diagram showing percentage of ash and heating value of coal from. 415
field work in. 400
geology of. 402-403
location of. 399
map of southwestern Oregon, showing. 400
map of. 404
sections of coal beds in, plate showing. 408

Page.
Eden Ridge coal field, Oreg., structure of.... 403
surface features of.... 401
Elliott, Frank, work of.... 51
Ellis formation, occurrence and character of.... 341-342

F.

Farmer, Frank, work of.... 142
Fayetteville formation, occurrence and character of.... 37-38
Forelle limestone, occurrence and character of.... 58
Fort Scott limestone, formations above.... 40
occurrence and character of.... 40
Fort Smith-Poteau gas field, Ark.-Okla., field work in.... 23
geology of.... 24-33
location and description of.... 23
map of.... 32
oil in, probability of striking.... 31
structure of, general character of.... 26
theory as to source of oil and gas in.... 31
topography of.... 23-24
wells in, records of.... 32-33
Fort Union formation, coal in.... 370-372
correlation of.... 109
fossils in.... 107
occurrence and character of.... 65, 104-106, 250-251, 299-300
sections showing structure of.... 106
Fox Hills sandstone, occurrence and character of.... 248
occurrence of, in Montana group.... 64

G.

Gas and petroleum, papers on.... 9-154
See also particular districts, places, etc.
Gebo formation, correlation of.... 108
fossils from.... 101
occurrence and character of.... 100-101
section showing structure of.... 101
Germano basin, location of.... 14
Gillan, S. L., work of.... 142
Glacial drift, occurrence and character of.... 301, 348
Glacier coal field, Wash., coal beds in, character of.... 392-393
coal in, character of.... 392
geology of.... 390-392
location of.... 389-390
map showing.... 389
paper on.... 389-398
prospects in, location and description of.... 393-398
structure of.... 392
surface features of.... 390
Gladeville sandstone, occurrence and character of.... 173
Glenn oil and gas field, Okla., cross section showing.... 43
field work in.... 34
geology of.... 35
location of.... 34
map of.... 48
paper on.... 34-48
quality of oil in.... 47
structure of.... 42
Glenn oil and gas field, Okla., topography of. 34
Green River oil and gas field, Utah, field work in.... 115-117
history of development of.... 117-121
land surveys in.... 123
location of, index map showing.... 116
map of.... 132
oil accumulation, theory of.... 131-132
paper on.... 115-133
stratigraphy of.... 123-129
structure of.... 129-131
topography of.... 121-122
water supply of.... 122
wells drilled for oil or gas in.... 132-133
Greene, F. C., on the coal resources of part of northeastern Missouri.... 223-242
Griswold, W. T., work of.... 9

H.

Harlan sandstone, occurrence and character of.... 176-177
Harnsberger, T. K., work of.... 164, 356
Hartford anticline, gas wells in.... 28
location and character of.... 27-28
Hartshorne sandstone, coal beds above.... 25
occurrence and character of.... 25
Heavener anticline, location and character of.. 28
Henrietta formation, occurrence and character of.... 230
Herald, Frank A., work of.... 51
Hewett, D. F., on Shoshone River section, Wyo.... 89-113
Hodge, E. T., work of.... 293
Hollis, Harry, work of.... 400
Hopedale oil field, Ohio, wells in.... 14
Horseshoe Creek district, Idaho, access to.... 379
coal beds in, development of.... 386-388
coal in, analyses of samples of.... 384-385
geology of.... 382
location and extent of.... 379
index map showing.... 380
map and sections of.... 388
paper on.... 379-388
structure of.... 383
surface features of.... 381

I.

Idaho, coal in. *See* Horseshoe Creek district.
Illinois, coal of, analyses of.... 497
description of.... 510
Ilo formation, fossils in.... 104
occurrence and character of.... 103-104
section showing structure of.... 104
Indian Creek syncline, locality and character of.... 182-183

J.

Jaquet, J. R., work of.... 357
Judith River formation, coal in.... 335-337, 369-370
occurrence and character of.... 345-348
sections showing structure of.... 345-347

K.

Kansas City formation, occurrence and character of.... 229
Kentucky, coal resources of. *See* Pound quadrangle.

Page.
Kentucky, coals of, analyses of 497
coals of, description of..... 510
Kootenai formation, probable occurrence of.. 342

L.

Lance formation, occurrence and character of. 65, 249-250, 298, 319-321
occurrence of Cannonball marine member in..... 249
Landes, Prof. Henry, work of..... 389
La Plata sandstone, occurrence and character of..... 125
Lee formation, coal beds of..... 184-185
correlation of..... 180
occurrence and character of..... 170-171
Lee, Wallace, work of..... 317
Lesher, C. E., on Eden Ridge coal field, Oreg..... 399-418
Lloyd, E. R., on Cannonball River lignite field, N. Dak..... 243-291
Low Splint coal bed, Virginia, occurrence and character of..... 202-203
Lupton, C. T., on oil and gas near Green River, Utah..... 115-133

M.

Madison limestone, occurrence and character of..... 341
Mancos shale, occurrence and character of.... 128
Massard Prairie, Ark., discovery of natural gas in..... 23
Massard Prairie anticline, gas wells in..... 27
location and character of..... 27
McAlester shale, occurrence and chara ter of.. 25
McElmo formation, gas in 127
occurrence and character of..... 125-127
Salt Wash sandstone member of..... 127
section showing structure of..... 126
Meeteetse formation, coal in..... 102
occurrence and character of..... 102
section showing structure of..... 103
Milton anticline, part of, location and character of..... 28
wells sunk in..... 28
Mississippi River, gas from mud lumps at mouths of..... 19-22
Mississippian rocks, distribution of, in Pound quadrangle, Va.-Ky..... 169
occurrence and character of, in Cadiz quadrangle, Ohio..... 10
Missouri, northeastern, coal beds of..... 231-235
coal of, chemical analyses of..... 235-239
equipment for mining..... 240-241
methods of mining..... 241
production of..... 241
quality of..... 235
quantity of..... 239
coal resources of, character of..... 223-24
development of..... 239
future prospects of..... 242
geography and topography of..... 224
geology of..... 225-231
history of..... 239-240
location of..... 223
index map showing..... 223

Page.
Missouri, northeastern, map showing, with sections of coal..... 234
paper on..... 223-242
structure of..... 231
Montana, coal in. *See* Big Sandy coal field; Cleveland coal field; Musselshell and Judith.
coals of, analyses of..... 49
description of..... 510-511
geology and coal resources of. *See* Custer.
lignite in. *See* Plentywood and Scobey.
Montana group, fossils from..... 64-65
Fox Hills sandstone, occurrence in..... 64
occurrence and character of..... 63-64
Pierre formation, occurrence in..... 64
section showing structure of..... 63-64
Montreal anticline. *See* Poteau anticline.
Moore, R. C., work of..... 317
Morrison formation, occurrence and character of..... 60, 61, 94-95, 431
section showing structure of..... 95
Morrow formation, occurrence and character of..... 38-39
Mud lumps at the mouths of the Mississippi, composition of gas from..... 20-22
conclusions reached regarding..... 22
development of..... 19
mud springs a feature of..... 20
occurrence and character of..... 19
Munn, M. J., work of..... 9
Musselshell and Judith, Mont., area between, coal in, paper on..... 329-337
area between, coal in Eagle sandstone in..... 334-335
coal in Judith River formation in.. 335-337
field work in..... 329
geologic map of..... 336
geology of..... 331-334
location of..... 329
index map showing..... 294
structure of..... 333-334

N.

Natural gas. *See* Gas.
Neumann, L. M., work of..... 244
New Mexico, coals of, analyses of..... 498-499
coals of, description of..... 511-512
geology and coal resources of. *See* Sierra Blanca coal field.
petroleum in. *See* Dayton.
Niobrara shale, occurrence and character of.. 63
North Dakota, lignite in. *See* Cannonball River lignite field.
Norton formation, coal beds of..... 185-188
correlation of..... 180-181
correlation of coal beds of..... 172-173
occurrence and character of..... 171-172

O.

Ohio, oil and gas in. *See* Cadiz quadrangle.
Oil and gas, theory as to source of..... 29-30
Oklahoma, crude oil from, analyses of..... 48
oil and gas in. *See* Fort Smith-Poteau gas field; Glenn oil and gas pool.

Page.

Oregon, coal in. *See* Eden Ridge coal field.
coals of, analyses of... 499
description of... 513

P.

Pack, R. W., on reconnaissance of Barstow-Kramer region, Cal... 141-154
Pardee coal bed, occurrence and character of... 204-205
Pennsylvania, coals of, analyses of... 499-502
description of... 513-517
Pennsylvanian rocks, distribution of, in Pound quadrangle, Va.-Ky... 170-179
Petroleum and natural gas, papers on... 9-154
Pierce, R. Z., work of... 51
Pierre shale, occurrence of... 319
in Montana group... 64
Pine Mountain fault, occurrence and character of... 182
Pitkin limestone, occurrence and character of. 38
Pittsburgh coal, appearance of, in Cadiz quadrangle, Ohio... 10
irregular formation of, cause of... 10-11
Pleasanton formation, occurrence and character of... 229-230
Plentywood-Scobey lignite field, Mont., culture of soil in... 296-297
description of... 293-294
field methods used in... 294
geology of... 297-302
lignite in, analyses of samples in... 304
description of, by townships... 306-315
development and use of... 315
distribution of... 305
paper on... 293-315
physical and chemical characters of... 302-305
map showing coal fields in... 294
sections of lignite beds in, plate showing. 314
structure of rocks in... 302
surface features of... 295
Plentywood, Mont., lignite in vicinity of.. 293-315
map of area near... 314
Poteau anticline, gas wells in... 27
location and character of... 27
Poteau syncline, location and character of... 29
Pottsville formation, occurrence and character of... 10
Pound quadrangle, Va.-Ky., accessibility of 168-169
coal, analyses of, in... 218-219
chemical composition of, in... 216-217
quantity of, ultimately available in 214-216
correlation of Pottsville formation in, plate showing... 178
development of... 220
drainage of... 167-168
geologic map and sections of... 220
geology of... 169-183
Kentucky area, description of coal beds of... 206-214
location of... 166
index map showing... 166
mining conditions in... 220
paper on coal resources and general geology of... 165-221

Page.

Pound quadrangle, Va.-Ky., sections of diamond-drill holes in, plate showing. 170
structure of... 181-183
topography of... 167-169
Virginia area, description of coal beds of 184-206
Pound syncline, locality and character of.... 182
Powell Mountain, Va., coking coal in, correction of previous report relative to. 163
field work in... 163

Q.

Quartzite gravel, occurrence and character of, in Plentywood-Scobey lignite field, Mont... 300-301

R.

Rhode Island coal field, analyses of coal samples from... 158-159
anthracite beds of... 156-157
anthracite of... 157-162
briquetting tests with... 160-161
chemical composition of... 158-159
discussion of... 155
household use of... 160
metallurgic use of... 161
paper on... 155-162
physical character of... 157
steaming tests with... 160
use of, by conversion into gas... 161
location of... 156
sketch map showing... 162
rocks of... 156
Richardson, G. B., on petroleum near Dayton, N. Mex... 135-140
Richmond, Ohio, and vicinity, oil wells in.. 14, 17
Rogers, G. S., on geology and coal resources of eastern Montana... 316-328

S.

Salem anticline, location of... 13
Satanka shale, occurrence and character of.. 57-58
section showing structure of... 58
Savanna formation, location and character of. 25
Scio oil field, Ohio, development of... 12
Scobey, Mont., lignite in vicinity of... 293-315
map of area near... 308
Second Cow Run sand, character of... 12
Shaw, E. W., on gas from mud lumps of the Mississippi... 19-22
Shoshone River area, Wyo., description and location of... 89-90
fossils collected in... 90, 93, 99, 101, 104, 107
geology of... 91-110
method of work in... 90
oil and gas in... 110-113
oil in, analyses of... 113
oil sands in... 111-112
structure and columnar section of rocks exposed in, plate showing... 108
structure of... 109
Sierra Blanca coal field, N. Mex., access to.. 421
coal in, analyses of... 450-451
difficulties of mining in... 451-452
field work and land surveys of... 421
geology and coal resources of, paper on. 419-452

Page.
Sierra Blanca coal field, N. Mex., geology of ... 425–436
history of development of ... 422–424
investigation of, object of ... 419
location and extent of ... 419
map of New Mexico, showing ... 420
map of ... 450
map of White Oaks district in, and sections of coal ... 446
structure of ... 436–442
topography of ... 424–425
White Oaks district, coal in ... 442–446
map of ... 446
Sloan, A. H., work of ... 317
Smith, C. D., on Glenn oil and gas pool, Okla ... 34–48
on structure of Fort Smith-Poteau gas field, Ark.-Okla ... 23–33
St. Anthony coal field. *See* Horseshoe Creek district.
Standiford coal beds, Virginia, occurrence and character of ... 199–201
Steubenville quadrangle, Ohio-W. Va.-Pa., oil pools in ... 14
Sugarloaf syncline, location and character of ... 28
Sundance formation, correlation of ... 107
fossils from ... 60, 93
occurrence and character of ... 59, 92
sections showing structure of ... 59–60, 92, 93

T.

Taff, J. A., work of ... 23
Taggart coal bed, Virginia, occurrence and character of ... 201–202
Thom, W. T., jr., work of ... 244
Thomas, H. R., work of ... 478
Thompson, Utah, area near, coal in, analyses of samples of ... 467
area near, coal in, physical character and chemical composition of ... 467–474
field work in ... 455
general features of ... 458–467
history and development of mining in ... 474–476
land surveys in ... 455
map of Thompson coal field in ... 468
paper on ... 453–477
previous work in ... 454
stone available for use in ... 476–477
stratigraphy of ... 456–457
structure of ... 457–458
topography of ... 455–456

U.

Page.
Utah, coal in. *See* Thompson; Wales.
coals of, analyses of ... 502
description of ... 517–518
map of, showing location of coal fields in ... 454

V.

Virginia, coal resources of. *See* Pound quadrangle.
coals of, analyses of ... 503–505
description of ... 518–522
coking coal in. *See* Powell Mountain.

W.

Wales coal field, Utah, coal in, analyses of samples of ... 486–487
coal in, chemical composition of ... 484–488
general character of ... 481
field work in ... 479
history and development of ... 489
location of ... 478
map of Utah, showing ... 454
map of ... 484
mines and prospects in ... 481–484
paper on ... 478–489
previous reports on ... 479
stratigraphy of ... 480
structure of ... 480–481
topography of ... 479–480
Washington, coal in. *See* Glacier coal field.
Wegemann, C. H., on geology and coal resources of Sierra Blanca coal field, N. Mex ... 419–452
West Virginia, coals of, analyses of ... 505–506
description of ... 522–525
White Oaks district. *See* Sierra Blanca coal field.
White River formation, occurrence and character of ... 66, 250–251
Quaternary rocks in ... 66–67
Wise formation, coal beds in ... 174–176, 188, 196
correlation of ... 181
occurrence and character of ... 173
Woodruff, E. G., on Glacier coal field, Wash ... 389–398
on Horseshoe Creek district, Idaho ... 379–388
work of ... 90, 163, 244
Wyoming, coals of, analyses of ... 507
coals of, description of ... 525–526
oil and gas in. *See* Douglas oil and gas field; Shoshone River area.