THE ELK HEAD ANTHRACITE COAL FIELD OF ROUTT COUNTY, COLORADO.

BY FREDERIC F. CHISOLM.

My attention was recently called to an alleged discovery of a true anthracite coal which was said to occur in Routt county, on the head waters of the Elk Head creek and of a branch of the Elk river, and as the matter was one of considerable interest to the Union Pacific railway, I went to the location as soon as possible to ascertain its value. As anthracite coal does occur here, I have made some notes on the subject which are of interest as showing an entirely new anthracite field; one where, so far as I know, the presence of anthracite has never been suspected.

The coal occurs in the Fox Hills rocks about twenty miles in a direct line northwest of Steamboat Springs. The country here is covered by an outflow of an eruptive rock which Mr. Cross has kindly examined for me, finding it to be a basalt of unusual composition,—a nepheline-tephrite.

This eruptive mass is at some points quite close to the coal seams, causing the complete "baking" of the bituminous beds into anthracite. At other points, the eruptive sheet is at a greater distance from the coal, and here the metamorphism is less marked, and the coal has not lost a very large percentage of its volatile constituents and is properly a free burning anthracite of fair quality. The entire section seems to be underlaid by coal, but the depth of the snow prevented any careful study of the geology of the district. There are two distinct veins opened by cuts nowhere of greater length than ten feet so that the veins did not present as clean an appearance as they will undoubtedly have when they have been opened beyond the reach of atmospheric influences. All the

exposures showed the roots of grass and trees growing in the veins, except where the eruptive comes quite closely down to the coal. Hence the percentage of ash is generally high, especially in the free-burning anthracites. It is probable that this trouble will disappear when depth and covering is gained.

In the anthracite field proper there are three veins, resembling each other greatly. The upper vein is four feet in width and is separated from the overlying eruptive by about thirty feet of sandstone, similar to that which covers the anthracite vein in the Irwin field in Gunnison county. The coal is jet black when broken and has a brilliant lustre. The action of the weather has rusted the outcrop to a dull brown color. The coal is hard, but has a low specific gravity. It is full of the charcoal which occurs so commonly in Colorado lignites. Analysis of an ordinary specimen of the coal showed:

Specific gravity	1.39
Sulphur	0.79
Moisture	1.02
Volatile matter	9.66
Fixed carbon	83.50
Ash	5.82
Color of ash, grey.	

Eight feet of mixed clay and sandstone separate the upper vein from the middle one. This is three and one-half feet in thickness, and similar in almost every respect to the upper vein. Analysis of a sample showed:

Specific gravity	1.40
Sulphur	0.44
Moisture	2.50
Volatile matter	3.20
Fixed carbon	88.20
Ash	6.10
Color of ash, grey.	

Other analyses made from samples taken by others showed practically the same composition. The third vein

lies only about five feet below the middle one and is but one foot in thickness. It is separated from the second vein by mixed sandstone and clay. On account of its small size, no sample was taken here, but the anthracite is probably similar in every respect to the upper veins.

Quite a large amount of snow had already fallen, so that I was prevented from making any attempt to ascertain the extent of territory underlaid by the true anthracites. It is probable that the field is not very extensive.

Further development will be carried on in the spring as soon as the season will permit of work being done, and the Society will be presented with specimens which will more accurately represent the character of the coal than any which can now be obtained.

DENVER, COLO., Nov. 22d, 1886.