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MSM
HISTORICAL
COLLECTION

GEOLOGICAL MAPPING OF AN AREA ALONG THE FRISCO RAILROAD
BETWEEN CUBA AND SAINT JAMES.

BY

WILLARD MILES BENHAM AND WILLIAM ELLIOTT

A

THESIS

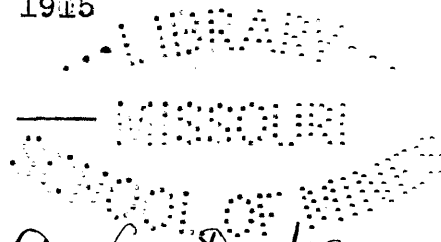
submitted to the faculty of the
SCHOOL OF MINES AND METALLURGY OF THE UNIVERSITY OF MISSOURI
in partial fulfillment of the work required for the

Degree Of

BACHELOR OF SCIENCE IN MINE ENGINEERING

Rolla, Mo.

1915



Approved by, _____

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Assistant Professor of Geology and Mineralogy.

18365

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INTRODUCTION.

Location.

The area mapped lies along the St. Louis and San Francisco Railroad, between the towns of Cuba and St. James. In width it extends to the contact of the Roubidoux and Jefferson City formations on each side of the Railroad, if this lies within a mile.

Methods of Field Work.

The chief object of the work has been the location of the Roubidoux-Jefferson City contact, if it occurred within a mile of the railroad. Distances and positions along the track were obtained by the use of a map and by counting telephone poles. Other locations were made by obtaining their bearing and distance from these points by the use of a compass and by pacing. Elevations were carried by aneroid barometers, using the railroad elevations at mile points as bench marks. An attempt has been made to locate all important outcrops; but these are shown only on the field map. Extreme accuracy has not been attempted; however, the chief drainage courses have been fairly accurately located, and the contours give a fair idea of the topography and elevations.

TOPOGRAPHY.

The railroad follows along the divide between the Meramec River on the south, and the Bourbeuse River on the north. To the north the drainage is gentle and the minor valleys are separated by broad, flat divides, the sides of which slope gentle to the streams, which have low gradients, especially in the western part of the area. To the south the drainage is abrupt. The valleys are narrow, have steep sides, a high gradient, and are close together.

GEOLOGY

Stratigraphy.

The formations to be found in this area are as follows,-

Carboniferous - Subdivisions undifferentiated

Cambrian-

Jefferson City

Roubidoux

Carboniferous, - This formation occurs at most points along the main divide and in some cases is to be found in the valleys, although in some of the latter cases its presence is thought to be due to slump. It consists of irregularly bedded layers of massive sandstone (coarsely

crystalline and usually less iron stained than the Roubidoux), white to brown chert, purple and green clay-shales, and white, flinty fire clay.

The contact between the Carboniferous and the Jefferson City is very hard to locate. Near St. James a good contact with the Cotton rock was found at several places. However, it was not determined whether the sandstone taken to be the bottom of the Carboniferous, in these cases, properly belonged to the Carboniferous or to the Jefferson City. No evidence of an unconformity was found at the contact.

A considerable thickness (20+ ft.) of massive, fairly pure sandstone occurs near Cuba at an elevation corresponding to that of the Carboniferous and upper part of the Jefferson City farther west. It is thought that this sandstone may be a part of the St. Peter sandstone which outcrops at Pacific. No reason, except the greater thickness, for differentiating this from the sandstone of the Carboniferous or the Jefferson City farther west, was found in the present work.

A pit, located in Sec. 29, R.5W., T.39N., probably near the center of the section, shows Carboniferous for a depth of about 75 ft. The thickness is probably less than this over most of the area. The elevation of the surface at this point is probably about 1,100 ft.

The pit is about 75 ft. deep, ^{and} about 250 ft. across. Iron in apparently enormous amounts was taken from the pit several years ago. An old railroad embankment extends from the mine to the "Frisco", the junction being about one-half mile west of Fanning.

Several iron-stained areas are located on the map, most important of which is the prospect near the center of the N.E. 1/4, Sec.4, T.38N.,R.5W.

Jefferson City, - This formation consists chiefly of a lower Pitted dolomite member and an upper Cotton rock member. Beds of sandstone and chert are also present, the Pitted dolomite and Cotton rock apparently giving way to these towards Cuba.

Roubidoux, - In most cases a layer of chert occurs at the top of this formation. It varies in thickness from point to point, the maximum thickness found being about 10 ft. The contact has been taken as the top of the main sandstone member just below this chert bed. It is characterized by being case-hardened and considerably iron stained. ~~Streams~~ at the points of crossing this formation are characterized by low gradients and precipitous drops a few feet in height.

Section near St. James,- The following section was obtained from outcrops down the draw, south of the track, starting at a point near 10 1/2 miles from St. Louis.

10 ft. Mixed clays and shales with some chert and sandstone.

10 ft. Massive sandstone.

20 ft. Cotton rock with layers of dull dolomite 12-16 in. thick interbedded.

5 ft. Pitted dolomite

10 ft. Cotton rock.

40 ft. Pitted dolomite.

10 ft. Cotton rock.

2 ft. Sandstone.

10 ft. Chert, with a 2 ft. layer of Cotton rock interbedded.

15 ft. Sandstone.

10 ft. Chert.

- - -(Roubidoux-Jefferson City contact placed here)

(?) ft. Sandstone.

Section near Cuba, - The following section was obtained ~~fr~~
 from exposures of rock in branch of creek running west
 from forks in S.E. 1/4, S.E. 1/4, Sec. 36, T. ~~36~~³⁹ N., R. 5 W.

? ft. Carboniferous sandstone.

80±ft. Unexposed.

10±ft. Cotton rock.

32 ft. Unexposed.

2 ft. Fitted dolomite.

4 1/2 ft. Unexposed.

2± ft. Cotton rock.

10 in. Chert.

8 in. Sandstone.

5 ft. Unexposed.

2±ft. Dolomite.

15 ft. Unexposed.

-(Contact)-

? ft. Roubidoux sandstone.