

It would naturally be supposed that the watershed is at the highest point, namely, at Weed Patch Hill, but this is not the case. It is about two miles west of the eastern face of the hills. Most of the streams crossed east of Weed Patch Hill flow to the southeast and empty into Salt Creek several miles below the place where it is crossed by this section. The location of the watershed, perhaps, gives a clue as to the position of the rocks that once covered this region, which is now an excellent example of a completely dissected plateau.

This last section is typical of the Knobstone north of White River. The limestone has pushed farther to the west, leaving a wide area covered by the Knobstone, most of which is the muddy sandstone. The sections south of White River are also typical for that region. The St. Joseph section has very little sandstone exposed and the shale greatly predominates.

A glance at the map will explain why it is there are so many hills in the north in the Knobstone group; it is because of the thickness and wide distribution of the sandstone.

NOTES ON INDIANA GEOLOGY. BY J. A. PRICE.

In connection with the field work in geology at Indiana University during the last season the distribution of a strip of limestone, usually surrounded by outcrops of the Knobstone group and lying east of the main mass of the Lower carboniferous limestone of Indiana, was in part outlined. It is with this unconformity that this paper deals.

In the Report of the State Geologist for 1896, page 391, a strip of limestone commencing at Limestone Hill, eight miles southeast of Bloomington, and extending east of south through Heltonville to and probably beyond Fort Ritner, Lawrence county, is referred to.

Without attempting to solve the conditions under which this limestone was laid down, it is desired to touch upon the extent and relative position of this limestone strip and the Knobstone north and south of the points referred to in the report.

In sections 26, 27, 34 and 35, township 4 north, 2 east, Washington County, between Twin Creek, which flows north through sections 35, 36 and 25, and the East Fork of White River, which flows south through

sections 22, 27 and 34, lies a point of land one and one-half mile long and one mile wide. The top of this point is formed of limestone, which varies in thickness at different places around the point.

Near the center of section 34 the line of parting between the limestone and knobstone is 150 feet above the bed of the river. Farther north, near the south side of section 27, the line of parting is 140 feet above the river.

At the north end of the point of land in section 22 the line of parting is only 110 feet above the river, with 40 feet of limestone above, and at the northeast corner of the land the line of parting is only 60 feet above Twin Creek. At this point the overlying limestone is 100 feet thick.

At the south side of section 26 the knobstone is only 40 feet thick and is overlaid with 160 feet of limestone, while at the corresponding point on the west side the knobstone is 140 feet thick, with only 20 feet of limestone.

Near the bridge across Twin Creek in the northeast quarter of the northeast quarter of section 35 the line of parting is only 20 feet above the creek, and is overlain with 150 feet of limestone.

A well section near the northeast corner of section 27 shows the following strata: Soil, 35 feet; limestone, 10 feet; knobstone, 88 feet.

On the west side of a tributary of Twin Creek, at the east center of section 35, the line of parting is only 20 feet above the creek bed, while on the east side the hill is 190 feet high, without limestone. From the line of parting on the west side of the branch to the school house at the center of section 35 there is 150 feet of limestone, but from the school house west there is only a descent of 50 feet to the line of parting at the west side of the section. Fig. 4.

On the east side of the point of land between White River and Twin Creek the upper ledges of limestone form a cliff some 12 or 15 feet high. On the west side there is no cliff, and the exposures are covered over largely with debris.

In the center of section 26 is a point that extends to the southwest some 400 yards from the high sand hills east of the creek. The average height of this projection is about 100 feet. With the exception of 20 feet of knobstone at the base of this projection, the rocks are all limestone. The adjoining hill to the northeast rises 150 feet above the projection and is formed of knobstone.

On the north side of the projection and west of the wagon road are two ditches some 30 yards apart. In the ditch farthest east there is an

exposure of knobstone and in the other an exposure of limestone, the line of contact coming somewhere between these two ditches.

Farther south, in section 1, township 3 north, 2 east, occurs the same unconformity. From the road through the west side of section 1 to the line of parting in Clifty Creek is a descent of 150 feet. In going east to the head waters of one of the side branches of Rush Creek there is only a fall of 50 feet to the line of parting. The two points where the line of parting was observed are not over one-half mile apart.

Farther north, in 5 north, 2 east, the limestone occurs on the west side of Guthrie's Creek. The line of parting is 25 feet above the creek bed, and from the line of parting to the top of the hill is 100 feet. All the exposures are limestone.

Near the top of the hill there is exposed a thick ledge of limestone which forms a small cliff corresponding to the cliff on the west side of Twin Creek. Farther west, where the streams have cut through the limestone and exposed the edges of the strata, no such cliffs are formed. Farther west the lighter the deposit for one-half mile or more, where it begins to thicken and dip gently to the west. A cross-section of the body of limestone is triangular in shape, with the base jutting against the knobstone, the altitude along the surface and the hypotenuse bedding upon the knobstone. (Fig. 2.)

Farther north, near the center of section 10, township 9 north, 1 east, the division between the knobstone and limestone crosses the road about 150 yards west of where the road turns to the north. The knobstone does not occur in the hill to the east, although this hill is 50 feet higher than the road. In a gully 250 yards northwest of the road, where the line between the pale-colored clay of the knobstone and the red clay of the limestone crosses it is the line of contact between the two formations. One hundred yards southeast of the center of the southwest quarter of northeast quarter of section 10 the displacement is found. (Fig. 1.)

In general this belt of limestone seems to extend north and south, or north 10° west, and has been observed from near Mount Carmel, in section 1, township 3 north, 2 east, Washington County, to near Unionville, in section 10, township 9 north, 1 east, Monroe County.

At all points of observation the limestone had the same general shape—thick on the east side, with but slight modifications in going west for a short distance, then gradually thinning out, and connected or disconnected with the limestone west of it.

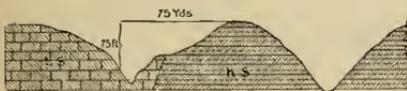
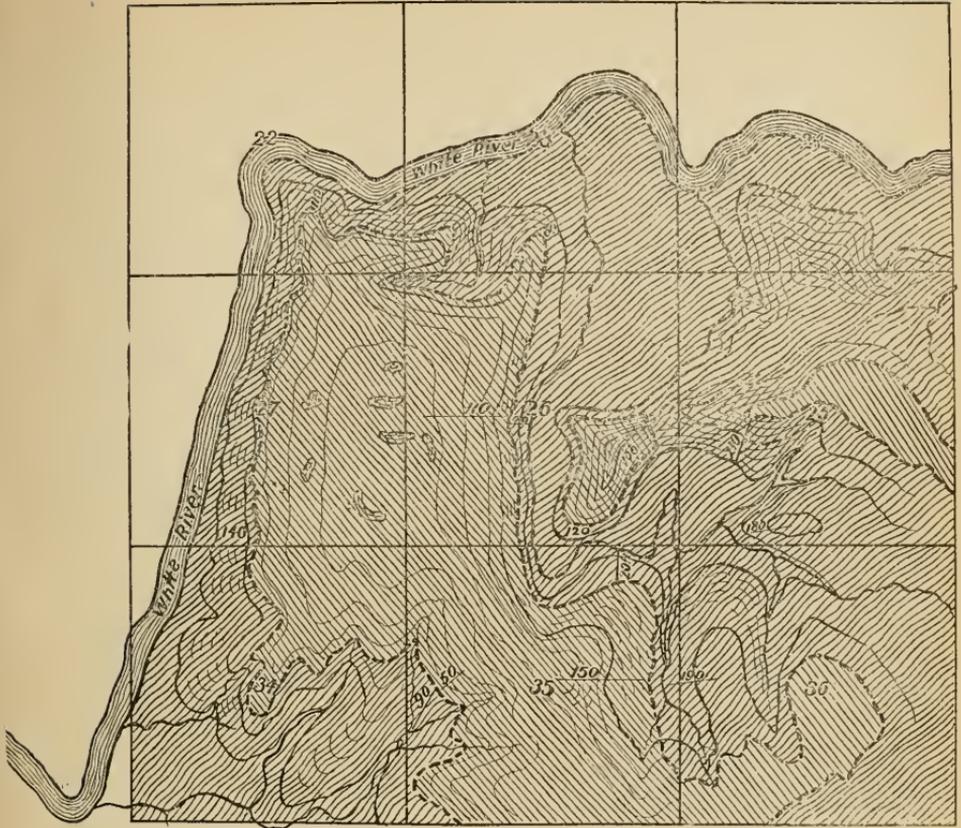


Fig. 1. Cross Section in Sec. 10, 9 N. 1 E.



Fig. 2. Diagrammatic Section of the l. s. belt.



Fig. 3. Cross Section South of the Center of Sections 25, 26 and 27.



No l. s.
on top.



Fig. 4. Cross Section in Sec. 35, 5 N. 2 E.

Figures 2 and 3 show an unconformity. These figures, however, are in part ideal, as the actual line of contact, or unconformity (if such it is), was not observed, being covered with debris. It is not possible, from the data in hand, to say surely whether this strip of limestone owes its existence to an unconformity or a fault.

The peculiar distribution of this strip of limestone effects the topography of that section of the country in which it is found. West of the easternmost line of contact the country is rolling, with quite a number of sink holes, characteristic of limestone formations. East of that line of contact the country is very rough; the streams are in deep, narrow ravines characteristic of the knobstone area.

The present location of the streams running north and south near this point is due largely to the unconformity, they following the line of contact, or, having cut below the limestone level, are following channels in the knobstone.

AN OLD RIVER CHANNEL IN SPENCER COUNTY, INDIANA. BY ARTHUR
C. VEATCH.

All that portion of Spencer County south of the line which separates townships 5 south from that of 6 south, and west of a line running north and south through Grandview, may be divided into two physiographic regions, a plain and a hill region.

The plain may be subdivided into three parts. First, a broad, level plain extending southwest along the western boundary of the county. (See Fig 1.) It has the same general trend as Little Pigeon Creek, and will therefore be called Pigeon Plain, although it is not now occupied by Little Pigeon Creek. The two valleys are separate and distinct. Where Pigeon Plain enters the northern part of the area under consideration it is about two miles wide. It gradually widens until at Midway it is about four miles, at Richland five, and continues at this width until it enters the second division of the plain region, the river plain of the present Ohio.

Only a portion of this river plain comes properly under the present discussion of Spencer county, as a part lies in Kentucky. Taking the two parts together, the average width of the plain is between four and five miles. That portion which lies in Indiana is very irregular on account of the meandering course of the river. It includes all land locally termed the