ART. L.—*Note on the Laramie Group of Southern New Mexico;* by JOHN J. STEVENSON, Professor of Geology in the University of New York.

IN a former paper* the writer gave some notes respecting the Laramie of Southern New Mexico, as shown in the vicinity of Galisteo creek. Some additional facts respecting the same, obtained during the present summer more than one hundred miles south from Galisteo creek, may be of interest.

The Laramie group is practically continuous on the east side of the Rio Grande Valley, southward from Galisteo creek, to certainly five or six miles beyond San Pedro, or one hundred and fifty miles south from Santa Fe. Coal beds have been opened near Galisteo creek, in the vicinity of the Tuerto mountains, near the Sandia mountains, and at several other localities as far south as San Pedro. The outcrop on the east side of the Rio Grande Valley has been carefully traced and mapped by Mr. J. M. Robinson, for the Atchison, Topeka and Santa Fe railroad company. The absolute continuity of the field is interrupted only by a few narrow cañons and the bluffs marking the western edge of the area can be followed as easily as those marking the eastern edge of the Trinidad coal field in northern New Mexico.

The San Pedro locality is nearly nine miles east from the Rio Grande, and is about twenty-three miles south-southeast from the city of Socorro, whence it can be reached conveniently by a wagon road passing through the villages of San Antonio and San Pedro; but before long it will be more convenient of access, as the railroad company contemplate building a branch road to the coal.

In this southern part of the field one observes the same features as on the Galisteo. Instead of the yellow or buff sandstones which predominate in the Trinidad and Cañon City coal fields, shales prevail, and for the most part the sandstones are soft and often argillaceous. Thin beds of hard, fine-grained sandstone are shown, with distinct jointing and breaking into angular fragments, which retain their sharpness even after long exposure to the weather. When seen from a little distance these thinner beds resemble sheets of igneous rock. As on the Galisteo, beds of iron ore with concretionary structure are numerous, as also are beds of ferruginous clay with cone-in-cone structure. These ferruginous beds are not confined to the lower part of the group. The shales are drab to black and in many of the beds are fissile.

* This Journal, vol. xviii, p. 371.

At the San Pedro locality, four beds of coal were seen within a vertical distance of barely one hundred feet. The lowest bed has the following structure:

Upper division,		
Coal	0′ 8″	
Clay	2′ 6″	
Coal	1′ 4″	
Shale		2′ 3″
Lower division		6′ 9″
Coal	4′ 4″	
Clay	0′ 2″	
Coal	2′ 3″	

The blossom of the next bed at nearly twenty feet higher is somewhat more than five feet thick. The bed contains much coal but it is so broken by partings that perhaps the whole may be unavailable. The third bed is but two or three inches thick and is embedded in dark shale. The highest appears to be little more than two feet thick, the estimate being made from its badly weathered blossom. The dips are southward and vary from seven to fifteen degrees.

The lowest coal bed has been opened by a slope one hundred and fifty feet long, and a large quantity of the coal has been tested on the railroad engines where it worked satisfactorily. Its quality varies in different parts of the bed and the differences in physical characteristics suggest that the relation between fixed carbon and volatile matter may vary in the several benches. The coal from some portions closely resembles semi-anthracite, while that from others cokes readily. This opening is not new, coal having been obtained from it years ago to supply Fort Craig.

These beds belong at not less than two hundred feet above the base of the group.

That this field belongs at the same horizon with the Trinidad coal field has been announced by Mr. Lesquereux, Dr. Hayden and the writer, as proved by the stratigraphy and by the testimony of the fossil plants. In the paper already referred to the writer stated that he had observed on the Galisteo an unexpected intimacy between the Laramie and the Fort Pierre and that he had obtained *Ostrea congesta* from a ferruginous bed high up in the Laramie. This intimacy is much more marked at the San Pedro locality. Stratigraphically and lithologically there is no means of distinguishing the Laramie from the Fort Pierre, aside from the coal beds. Were these absent an observer would hardly hesitate to regard the whole as one group, for there is much less of sandstone here than on the Galisteo. The ferruginous beds with cone-in-cone structure appear to be wholly non-fossiliferous on the Galisteo, but at

the San Pedro locality these beds are fossiliferous, though not to the same extent as the ore-beds. The presence of marine fossils was not ascertained until just before leaving the place, and but a few minutes remained in which to collect. The specimens therefore are such only as could be broken hastily from the weathered surface of the beds, and in most cases suffice for merely generic determination. The list as determined by Prof. R. P. Whitfield is as follows:

Ostrea glabra; Anomia; Corbula, 3 species; *Camptonectes?; Tellina?*, and a fragment of some gasteropod.