

to have been no recognition of the fact that in the original reference¹ a similar condition was acknowledged to exist in the Highland Range and Eureka District sections. Indeed the writer's attention was only called to this fact after his curiosity had been aroused by noticing that the collections at the three localities (Big Cottonwood canyon, Pioche, and in the Highland range) were all made by the same field observers (C. D. Walcott and "J.E.W.") during the same field season at a time (1885) when the *Olenellus* fauna was believed by Mr. Walcott to be of Middle Cambrian age.²

A strong intimation of the fact that the *Olenellus* horizon was to be distinguished from that of the other fossils in both the Highland Range and Big Cottonwood Canyon sections was, however, given by Mr. Walcott five years earlier³ when he said: "In both sections *Olenellus* comes first, and then *Lingulella*, *Bathyriscus producta*, etc." Here Mr. Walcott does not refer specifically to the collection from Pioche but on page 35 of the same work he states that the "Pioche fauna was secured from beds 2, 3, and 4 of the section in the Highland Range," where they have a combined thickness of 131 feet⁴ and four of the species occurring at Pioche are stated⁵ to occur also, though they are not so listed, in corresponding beds in the Highland Range section. The applicability to the Pioche collection of the remarks concerning the adjoining Highland range is, therefore, clearly shown.

Two shale series have been identified in the vicinity of Pioche (see pages 96-98). The first collection from the lower shales, or the one to which the term Pioche formation has been applied, included two species of *Olenellus* only, and nowhere in their discussion of this fauna do either Gilbert⁶ or White⁷ give the slightest indication that species representing other genera were included in the collections. This only corroborates

¹ Walcott: Bull. U. S. Geol. Survey, No. 81, 1891, p. 319.

² Idem, No. 30, 1886.

³ Idem, p. 39, section 76.

⁴ At Pioche the thickness is given as 210 feet: Walcott, Smithsonian Misc. Coll., vol. 53, No. 1, 1908, p. 11; and 400 feet: Pack, School of Mines Quarterly, vol. XXVII, 1906, p. 295.

⁵ Walcott: Bull. U. S. Geol. Survey, No. 30, 1886, p. 35.

⁶ U. S. Geol. Surveys West 100th Meridian, vol. III, 1875, pp. 182-183.

⁷ Idem, vol. IV, 1877, pp. 7 and 44-48.