## J. B. TYRRELL ON THREE

1390-1395. Similar shale, with a few crystals of selenite. 1400-1405. Similar shale, without selenite.

No. 14.—This series is a downward continuation of the last, the shale gradually becoming more calcareous, till it appears to terminate in a band of coarse fragmental limestone, called sandstone by the driller. From this limestone band there was a considerable flow of water which rose rapidly in the pipe to within eight feet of the top. The water had a flattish taste from the presence of salts of soda. This limestone band is regarded as the base of the Niobrara formation. The following is a serial description of the beds :—

1410. Dark grey non-calcareous clay shale, with a few rotaline foraminifera, and some moderately large fragments of the shell of Inoceramus.

1415-1425. Similar shale, with a few fragments of fish remains, but no foraminifera.

1430-1445. Similar shale, with a few prisms of Inoceramus.

- 1450. Lighter grey calcareous clay shale, with large and small prisms of the shells of Inoceramus, pieces of shells of Ostrea, and a few fragmentary fish remains.
- 1455. Similar shale, with a large number of foraminifera, Globigerina cretacea being especially abundant.
- 1460-1485.—Similar shale, with a few Inoceramus prisms, and a greater or less number of small foraminifera belonging to such genera as Textularia, Anomalina, etc.
- 1490-1510. A light-grey calcareous shale, with numerous specks of pyrite, many small species of foraminifera, prisms of Inceeramus, and pieces of the pearly shell of Ostrea, and fish remains.
- 1515–1555. A harder grey calcareous shale, holding similar organic remains, in varying quantities.
- 1565. Dark grey slightly calcareous thin-bedded shale, holding a few foraminifera, and fragments of fish remains.
- 1570. Dark grey non-calcareous thin-bedded shale, without organic remains.
- 1575. Dark grey clay shale, with many fragments of the shells of Inoceramus. With these are a few species of foraminifera of such genera as Textularia, Anomalina, etc., with fragmentary fish remains, and moderately large masses of pyrite. This gritty or fragmental layer formed the sandstone of the driller, and from it quite a large supply of water rose in the tube.
- 1580-1590. Dark grey clay shale, with a few corroded prisms of Inoceramus, small foraminifera, and fragments of fish remains. When the drillings are washed almost all is carried away in the water as a fine mud. The latter specimen, when drying, became covered with a white efflorescence of sulphate of soda?
- 1595. Similar shale, breaking down into thin flakes, and containing small cubical crystals of pyrite, prisms of Inoceramus, fragments of fish remains, and pieces of the shell of Ostrea, but no recognizable foraminifera.

No. 15.—Consists throughout, as far as could be determined] from the specimens, of a dark-grey, non-calcareous clay shale. In its upper portion it is apparently very bituminous, and breaks into minute flakes, while below it is somewhat lighter in colour, does not break into thin flakes, and contains minute angular grains of clear quartz sand.

The following is a somewhat more detailed categorical description of the beds passed through :--

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