ART. LIX.—*Short Notes upon the Geology of Catoosa County, Georgia*; by A. W. VOGDES, U. S. Army.

A SHORT distance west of Catoosa Station, on the Western and Atlantic Railroad, we find a small cut which exposes the rocks of the Niagara period. This formation is composed in descending of the following strata:

1. Thin bed of limestone made up of crinoidal joints.
2. Cherty bed containing the columns of *Caryocrinus*.
3. Shaley beds with concretions.

4. Black slate containing about fifty per cent of bituminous matter.

This outcrop in the valley of the Chickamauga is not over ten feet in thickness and dips about twenty-five degrees to the east. A few hundred yards to the west along the river bank, the topography of the country becomes more hilly, and the railroad passes through a cut of about 100 feet. On the map of the county this is known as section 28, lot no. 204, or Taylor's Ridge. This section exposes an outcropping formation of the Upper Silurian Age which belongs to the Clinton

Epoch. The upper beds are thin and composed of an arenaceous limestone, containing fragments of Crinoids and shells more or less wave-broken, as if this stratum marked the line of the Clinton sea. Immediately beneath the limestone we find a laminated sandy bed intermixed with sandstone of different degrees of hardness, which is well exposed in the railroad cut and along the banks of the Chickamauga River. The total thickness of these beds is about 150 feet, the strata having a general dip 15° east.

The geological formation of Taylor's Ridge is more clearly defined with regard to the Upper Silurian age about ten miles southeast from Catoosa station, at Dug Gap in Whitfield county. This section exhibits the Lower Silurian black shales outcropping along the base of the gap, dipping about twenty-five degrees to the east, and known in Dalton as the "coal beds;" immediately above these shales the Medina sandstones appear or a sandstone which stratigraphically may be assigned to this group; as far as examined it contains no fossils. Superimposed upon these sandstones along the second bench of the Gap we find the Clinton, which is composed in descending order of the following strata:

1. Arenaceous layers and sandstone.
2. Hematitic layers containing *Calymene Clintoni*, *C. rostrata*, and generally trilobitic.
3. Arenaceous shales.
4. Sandstone containing *Streptorhynchus subplana*.
5. Hard sandstone containing hematite.
6. Light sandy beds of the Medina.

The best section examined is about twenty feet in thickness, but the measured thickness of the Clinton gives about 150 feet.

In order to illustrate the true geological sequence of Taylor's Ridge it is necessary to trace the different rocks from Atlanta to Ringgold, but at present we will simply give the section at Ringgold, which is about four miles to the west of our first section, taken near Catoosa station. The town of Ringgold is located in a valley composed of the Trenton limestone. This group is highly fossiliferous; it has a northwest and southeast strike, dips fifteen degrees to the east, being composed of a flinty rock, underlaid by a chocolate-colored shale, which is generally denuded; these shales are underlaid by a blue limestone of over three hundred feet in thickness. Superimposed and forming the hills is a great mass of red laminated sandstone of the Hudson River group. These sandstones are about five hundred feet in thickness, dip nineteen degrees east, one mile east of Ringgold in the gap, and contain only a few specimens of *Orthis testudinaria*.

Between Ringgold and Catoosa Station the Chickamauga river divides the ridge; the hills to the northwest are called Oak Mountains, and those on the southeast Taylor's Ridge. After passing through this gap the eastern exposure of these hills shows the overlying Medina, Clinton and Niagara groups.

The paleontological characteristics of this outcropping stratum of the Upper Silurian periods are interesting, especially the fossils of the upper beds. These fossils are poorly preserved and consist generally of casts. From our collection we have been enabled to identify the following species:

Calymene Clintoni Hall; *Cryptonymus (Encrinurus) ornatus* Hall and Whitfield; *Cryptonymus (Encrinurus)*, *Illænus*, *Proetus*; *Leperditia*, sp., having the right valve margined by a furrow, except along the dorsal edge, as in *L. marginata*; *Othis elegantula*, a species common to the Clinton and Niagara group; *Chaetetes lycoperdon*, cast from the lower beds; *Zaphrentis bilateralis*?, broken specimens from the upper bed; *Conularia*, sp.? 4

Of the *Cryptonymus ornatus* we have in our collection two pygidia which we have assigned to this species, although the casts do not show the nodes ornamenting the axis and pleuræ. The specimens compare otherwise with Professor Hall's type given in Palæontology of New York, vol. ii, pl. lxvii, fig. 1a. Vertical distribution Clinton group.

There is also a new trilobite, *Calymene rostrata* Vodges, from the upper arenaceous limestone beds of the Clinton group, Catoosa Station, Georgia, which will be fully described hereafter. It differs from all other species of this genus in having a distinct projecting process in front of the glabella. The facial lines cut the anterior border at the apex, giving to the frontal limb a triangular form; at their juncture the marginal border is raised and forms the triangular process which supports the projection.