

World, are peculiarly susceptible; and some of the examples of Scottish gold personal ornaments fully correspond with the probable results of such an anticipatory use of the metals."*

The metallurgic arts were, however, introduced into Northern Europe at a period prior to the dawn of authentic history, but now designated, from the remains of its novel arts, "*the Bronze Period*," and America had its corresponding ante-historic era, during which the metallurgic arts of Mexico and Yucatan were developed among a people to all appearance of the same race as the mound-builders of the Mississippi Valley, and, like them, totally ignorant of the more laborious and difficult art of smelting and forging the iron ore.

Professor Wilson having pointed out, somewhat in detail, the great similarity observable between the stone, bone, and horn implements and weapons of the American Indians and those found in the ancient sepulchral barrows of Northern Europe, and also the analogies between the copper tools and weapons of the mounds of the Mississippi Valley and the copper and bronze relics of Europe's pre-historic period: concluded by remarking that it must be regarded as a subject of just interest thus to perceive that aboriginal races, had been displaced by the historic races from the ancient area of Europe, equally rude in their arts, and low in the scale of civilization, with those whom the philanthropist and the scientific observer now watch with a common regret disappearing before the advances of the European on this great continent, like the dews of morning before the rising sun.

**On some New Genera and Species of Cystidea from the
Trenton Limestone.**

Read before the Canadian Institute, February 11th, by E. BILLINGS,
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The Cystidea were first set apart as a separate order of the Echinodermata by the late illustrious geologist, Leopold Von Buch, in a memoir which appeared in 1845 in the Transactions of the Royal Academy of Sciences of Berlin, and afterwards in 1846 translated and published in the Journal of the Geological Society of London. From the latter publication the following definition of the order is extracted:

"The CYSTIDEA were natural bodies supported on a stem or pedicle, which was attached to the ground; their surface, more or less spherical, was covered by a great number of polyhedral plates, accurately fitted to one another, and between these plates were certain openings, necessary for the performance of the animal functions.

"With regard to the openings on the surface, we find in all the Cystidea, 1st, that the mouth was planted in the central part of the upper surface, generally in a moveable proboscis covered with minute plates; 2nd, that besides this mouth, and close to it, there is generally, if not always, a small anal orifice penetrating the plate, but not itself surrounded with any plates peculiar to it; 3rd, that further towards the middle, but almost invariably on the upper half of the body on which the mouth is placed, there rises a round or oval aperture, not connected with the mouth, and often covered by a five or six-sided pyramid, which seems to be composed of as many little valves. This probably forms the ovarian orifice of the animal."—*Quarterly Journal, Geological Society*, vol. ii, p. 29.

Von Buch also supposed that the Cystidea were not provided

with arms similar to those of the Crinoidea, but since the date of his monograph several species have been brought to light furnished with appendages which may be called arms. These, together with certain other organs supposed to be peculiar to this group, will be referred to hereafter.

The Cystidea are rare fossils, and as yet but imperfectly understood in some respects. Von Buch, in the article above quoted, describes seven species known in 1845 on the continent of Europe, and in 1848 Professor E. Forbes, in the Memoirs of the Geological Survey of England, gave an account of twenty-one species discovered in the Silurian rocks of Great Britain. Of these, two were found to be identical with *Spheronites aurantium* and *Caryocystites granatum*, also described by Von Buch, while several others were mere fragments, recognised to be portions of Cystideans. It is probable that in all Europe not more than thirty species had been clearly established in 1848.

The American species already made known are only seven. They are the following:

1st. A fossil found at Bytown many years ago by Dr. Bigsby, and described by Mr. G. B. Sowerby in Vol. II. of the Zoological Journal, p. 318. Professor E. Forbes refers this curious organism to the genus *Agelacrinites* of Vanuxem.

2nd. *Echino-encrinites anatifomis*, in Vol. I. of Hall's Palaeontology of New York. This species and the former are the only Cystidea yet described as having been discovered in the Trenton limestone. It has been found by Mr. Logan in Lower Canada, and in Owen's Report on the Geology of Wisconsin, p. 505, it is said to have been met with in the upper magnesian limestone of that region, a formation classified as the equivalent of the Trenton limestone.

3rd. *Callocystites Jewettii*.

4th. *Apiocystites Elegans*.

5th. *Hemicystites Parasitica*. The three last are from the Niagara shale, and described in Vol. II. of the Palaeontology of New York.

6th. *Lepadocrinites Gebhardii*, from the Pentamerus limestone, figured but not described at p. 346 in Mather's Report on the Geology of the First District of New York.

7th. *Agelacrinites Hamiltonensis*, from the Hamilton group, noticed in Vanuxem's Report on the Geology of the Third District at p. 158, and figured at the end of the volume.

I now propose to add to the above list of American Cystidea several new species discovered by me within the last two years in the Trenton limestone at Bytown and in the immediate vicinity. The first of these, as it constitutes a new genus, may be called *Glyptocystites*, on account of the profusion of sculpture with which its surface is ornamented. Its description is as follows:

GENUS GLYPTOCYSTITES. (Nov. gen.)

[Greek, γλυπτος, sculptilis, and κυστις, vesica.]

Body oblong, composed of four horizontal, irregular series of plates, so disposed as to form five nearly vertical pillars, each of which supports an arm; pelvic plates four; second, third, and fourth series of five plates each, summit closed by several small pieces; arms originating from the top of the fourth series, deflected downwards, and attached to the sides throughout their whole length; a sinuated groove, terminating upwards in the mouth, occupies the centre of each arm; a row of tentacles on each side of each groove, mouth situated in the apex, and closed by a valv-

*Wilson's Pre-historic Annals of Scotland, p. 214.