(7301)

Baltimore, Dec. 20th 1866.

Prof. O. C. Marsh,

Dear Sir,

I have sent to yow per Express all the Liassic fossils that I was able to procure at Fredericksburg during this trip. The very cold weather prevented me from obtaining the slabs in the manner stated by me to Mr. Niles.

It will be impossible to procure slabs while the frost penetrates so deeply.

I send you these specimens, not to fill the agreement with Mr. Niles respecting fine slabs, but to give you an idea of the nature of the specimens to be obtained from this deposite.

Hoping to call upon you in a few days, allow me to subscribe myself

Respectfully Yours,

P. R. Uhler.

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Baltimore, Jan. 11th 1888.

My dear Prof. Marsh,

As you are probably aware, I have been searching out the structure of the alluvial formations of Maryland, and have recently completed the connections of the series of beds. By traversing the country from the Delaware river across to Chesapeake bay, then northwestward along the edges of the primitive rocks, and along all the river and creek basins which run southeast

from them, I have traced out the points where the formations overlap and have finished in a rough way their superficial boundaries. The outcome of all this you will see in the little sketch map which accompanies this letter. It is the copy of a larger diagram attached to a paper which I read before the American Philosophical Society on Friday evening last. May I ask you the favor to print in your American Journal of Science a short abstract, here enclosed, giving the pricipal facts which characterize the two formations and are

here called for convenience the Baltimorean and Albirupean. This is in no sense intended to conflict with the so-called Potomac formation named by the U. S. Geological Survey. That series, as I understand it, is far more comprehensive than those which I here designate, and the latter will probably be hereafter fitted into it. But as these deposits are well distinguished ~~think~~ by stratigraphical position as well as by fossils, I am driven to the conclusion that they should receive names. It seems impossible to

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correlate them precisely with the already named European members of the Jurassic or lower cretaceous, since so many parts of those formations as seen in Europe are absent from ours. The fossils which you recently described from Prince George's County go farther than anything else with which we are at present acquainted to establish the Jurassic character of the lower series of clays; if indeed these remains were taken therefrom. Mr. Hatcher should state precisely from which of the clays your vertebrate remains were taken. If from the

disturbed members of the series, they might be in a much later part of the column, than the lower iron ore series; especially as some of the fossiliferous strata in the neighborhood of Washington have been broken up and redeposited later with their fossil contents greatly shattered.

I gave Mr. Hatcher all the names of localities from which important fossils have been taken in this region, and I hope he will be able to make frequent visits to the iron-ore clays near Contee's station.

I am assured by men whom I

have recently seen from that neighborhood that fossil bones are being dug up from the iron-ore clays.

I regret that my time has been so occupied as to prevent me from going there myself, but your agent can get them as well as I can.

There is in my possession at the present time, a large collection of plant fossils, which I dug out of Federal Hill and its continuation. Prof. Fontaine is working up a series of them for publication, and I hope to

place another series in your hands, if you desire them, at a later date.

Truly yours,
P. R. Uhler.

17309 /

Remarks on two unrecorded alluvial formations in Maryland.

In the southern part of the city of Baltimore a monumental pile of red, white and blackish clays rise 85 feet above the inner harbor and form the prominence called Federal Hill. This high deposit of clay-strata was once 20 feet higher than at the present time, and it was overlaid by a narrow covering of brownish and yellow sand, capped by gravel and small quartz boulders which carried a crust of ferruginous sandstone, loaded with quartz pebbles. The hill is a typical member of a great freshwater and estuary formation which extended from the Delaware river about Newcastle to the Potomac river at Washington. It was laid down on the broken and eroded ledges of Archaean rocks where they projected out into the ocean. On the bottom, deep deposits of micaceous sands, thickly charged with boulders of all the adjacent rocks, fill the old channels and holes, and make an uneven, hillocky bed upon which numerous layers of white, pink,

For this belt of the alluvial in Maryland the name Baltimorean is suggested.

yellow and blue clays, and intervening sands containing more or less gravel, were laid by the rivers running from the highlands on the west. A column of these strata was accumulated to a thickness of perhaps 500 feet, and may be said to have an average dip towards the southeast of about twenty degrees. The upper, or variegated, clay bed is overlaid by gravel and drift, capped by a stratum of ferruginous sandstone which often takes on the form of pudding-stone. The clays next below rest on sand and sandy mixtures having the form of domes or hillocks to which they conform, producing the effect of undulating beds that thicken into hills or ridges at intervals of a mile or more. These hills of clay are generally connected at base, and in some cases bend down in deep curves, as we find under Chesapeake bay and the Potapsco river; but a very few of them seem to be detached. The stratified layers under the iron ore clays rest upon a very distinct form of angular white

sand which is generally quite easily recognized, and there is usually a thin seam of siliceous iron stone between the clay and the sand. These clays are well provided with fossil remains of many kinds of plants, and at least one kind of vertebrate the Hadrosaur, and possibly the Dinosaurs recently described by Prof. O.C. Marsh. Near the mouth of the Patapsco river there is a broken island of white sandstone, covering perhaps 2 acres in extent, and rising more than 12 feet above mid-tide. This body of quartzite is called the White Rocks, and is characteristic of a wide belt of the sandstone which stretches in ~~detached~~ broken areas all the way from the northern part of Delaware to the vicinity of Bladensburg, in Prince George's County. It dips at a lower angle than the Baltimore rear, rests immediately upon it, and passes beneath the green sand cretaceous. Fine exposures of it may be seen on the Severn river northwest of Round Bay. It is also distinguished by fossil remains of marine inver-

tebrates, such as annelid-borings, and brachiapods in the sandstone, and lignites, and other vegetable fossils in the stratified superincumbent clays. A thickness of about 200 feet has thus far been made out for this formation, which in its lower members, at least, is entirely marine. The name Albirupean is derived from albus, white, and rupes, a rock. Its greatest breadth from the mouth of Back river to near Bird river is somewhat more than 12 miles, and its greatest development south of Baltimore occurs in Anne Arundel county, between Curtis creek and the head of the Magothy river. Immense bodies of the sandstone crop out in this district, extend across the Severn, and appear beyond the Patuxent river between the Baltimorean and Cretaceous in Prince George's county.

A theory has prevailed with some of our geologists that a stratum of palæozoic sandstone passes beneath the clays and sands on

their inner edges, next the metamorphic rocks. Patches of such material do exist in the gneisses, and have been folded up with them, but they are in no way connected with the sandstone of the Albirupean; although a single bed of quartzite conglomerate, overlying the Baltimorean, seems to have caught up some of the fossils which have drifted from farther inland.

The Albirupean is laid down upon the denuded and eroded contours of the Baltimorean, and south east of the latter it lies like a slightly rolling plateau between the hills of that formation and the still higher and more abrupt hills of the green sand cretaceous. In this system, and immediately overlying the white sand and decomposing white sandstone, rests a series of clay strata, of lead, drab, red, and white color, in which are found the lignitic trunks and branches of trees, and many varieties of fossil leaves, buds, and seeds of plants. This member of the formation reaches a thickness of at least 75 feet, and is mostly composed of clays of very fine texture with almost no mixture of siliceous grit.

In one place on the Severn river about two miles below Indian Landing the white sand (stratum) is more than 60 feet thick, and is overlaid by 20 feet of pale variegated clays which rise and run into sandy loam, overlaid by 15 feet of ferruginous sand and sandstone, mixed with quartz pebbles and small drift. From Indian Landing to the head of Round Bay, the Albirupean occupies a width of nearly four miles, and it is well distinguished there from both the adjoining formations. From this point to the mouth of the Severn river it is hid from view by the overlying, Eroggra-containing, green sand Cretaceous, and has not been found in any part of the region around Annapolis. *

P. R. Uhler.

* Items from a paper recently read before the American Philosophical Society.

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Maryland.

New Jersey.

Archaean rocks.

Chesapeake Bay.

Delaware.

Potomac R.

Patapsco R.

Back R.

Middle R.

Gunpowder R.

Bush R.

Susquehanna R.

Northeast R.

Elk R.

Sassafras R.

Canal.

Magothy R.

Severn R.

South R.

Patuxent R.

Herring Bay.

Chester R.

Choptank R.

Eocene.

Cretaceous = Green sand series.

Albirupean.

Baltimorean.

Iron ores. (Carbonates of iron.)

Scale 1 2 3 4 5 10 miles.

P.R. Uhler fecit.

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Baltimore, Jany. 23, 1888.

Prof. O. C. Marsh,

Dear Sir,

Doctor Christopher Johnston sends his compliments and expresses regret that he was not at home to receive you last week. He has placed in my charge, and I have sent to you per Adams Express, the tooth of Astrodon Johnstonii which was the type employed by Dr. Leidy in describing the genus. It surprises me to see that the specimen is breaking apart and disintegrating into small grains.

In looking again at Mr. Tyzor's Journal I find that the tooth came from Latchford's iron-ore beds, near Cortes's, and that they, (two teeth) together with the rib of a whale?, were dug out of the lead colored clay between the upper bed of iron-ore and the lower or more stratified bed of ore.

I do not know where the other piece of tooth now is. Perhaps Dr. Leidy has it; as I now remember, it was only a small fragment of a tooth. The specimens were said to have been found at a depth of only "seven feet below the surface" of the ground.

Dr. Johnston asks me if the tooth can be returned within a few weeks. I have just sent off to your address by Adams' Express a small box in which will be found the principal impressions of Brachiopod; impressions of stem of Encrinite in the finest grained Albirupean sandstone; also Annelid-burrows? in another piece; a sample of the Mount Vernon, Va., sandstone, all from rock in place. Besides, I have included two valves of Gryphaea vesicularis from the middle greensand Cretaceous near Piscataway Creek; and a sample of the upper stratum of the

"White Rocks" island near the mouth of Patapsco river, adjoining Chesapeake Bay. I recognise the Palaeozoic features of the Encrinite stem and of the Brachiopod, but as I found them myself, there is no doubt about the locality from which they came, nor about the bed of rock to which they were attached, near the Back river. For lack of facilities for blasting the hard part of the bed, I have failed to get Brachiopods out of any but rotting parts of it; and the rotting of the rock changes its glassy lustre into a dull facies, and separates the grains of silica.

I regret that I cannot now send to you specimens of Belemnitella and other Cretaceous fossils from Arnes Friendship. Those which I formerly owned are now in the Johns Hopkins University, and I cannot find them at present.

Respectfully Yours.
O. R. Ickler.

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Baltimore, Nov. 17, 1888.

Prof. O. C. Marsh,

Dear Sir:

I write now to recognize your kind invitation to visit you on the occasion of your recent reception of the National Academy of Sciences, and to say that it pained me greatly to be obliged to forego this opportunity to meet you and to report what I had done geologically during the past Summer.

I have made trips to various localities on both the Eastern and Western Shores of Maryland, the result of which gives the boundaries

of the Eocene formation and with it the chief boundaries of the Cretaceous marl system of Maryland. From both shores I have collected specimens of Exogyra costata, Pycnodonta vesicularis and higher up films of the following, ie. the iron-stained clay coating the outside of the original specimens. Cardium perelongatum Whitf. Cardium exfaulense Con. Radula reticulata Gill, Trigonia sp?. Avicula sp?. Pecten sp?. Cibota obesa Whitf. and many others. But of more interest to you will be the fact not yet published that the "Laminated sands" are well developed on both shores. Forming beds 40-60 feet high on the South shore of the Elk river, for a distance of more than a mile, and the same

again on the Western shore from Round Bay pavilion to behind Cedar Point - charged with plant-fossils and bearing some vertebrate remains. But owing to the incoherent sand, almost contransportable. Over the seaward end of this member, the lower, blackened, greensand marls jut and inter mix, and these latter yield the Pycnodonta and Gryphaea. The Cretaceous marls are accessible over the region represented on Mr. Tyson's map and he also had specimens of Pycnodonta from localities as wide apart as Oxen Creek in Prince George's county and the tributaries of the Sassafras, Bohemia, and head of Chester rivers, besides the ravines in Annearundel on the shores of the Severn 5-10 miles north west of Annapolis.

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The Calcareous sand marl has not yet been positively identified on the Western Shore, but it outcrops on the Sassafras near Georgetown and reappears on the Chester river, about 2 miles below Chestertown.

The Eocene overlaps this Cretaceous greensand which we see filed up along the Severn, Patuxent, Potomac, Sassafras, and Elk rivers, and in the deep cuts made by streams we collect Cardita planicosta, Ostrea compressirostra, Turritella mortoni, one or more species of Cucullea, several Crassatellas &c. &c. The Eocene extends from the vicinity of Oxen run on the border of the District of Columbia to lower Cedar Point on the Potomac, Crosses the Patuxent above Lower Marlborough, from thence in runs

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across to the head of Herring bay, then outcrops on Kent island and the adjoining mainland of Queen Annes county at various points in the deep ravines connected with the creeks tributary to the Chester river on its south shore as far as the Andover branch near the Delaware state line. Its characteristic fossils Cardita planicosta, Tennitella morloni etc., have been found by myself in most of the ferruginous conspicuous ridges or hills in all of the territory here cited. In some places the shells are cemented into the ferruginous sandstone, iron-stone slabs in the ravines or deep cuts in roads. In Annarundel county these fossils are embedded in the indurated marls, composed of greensand and siliceous matter,

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I have nearly finished for publication a paper giving more details of these formations, but especially of the Eocene, and if you will favor me with a page or two in the American Journal of Science, I will send to you a summary of it. Can you perhaps get Prof. Dana to notice these good items in his next number of the "Journal".

McGee and others watch my movements very closely.

I have indicated many of my localities to Dr. Clark of the Johns Hopkins University and he has collected even more kinds of fossils than I have.

Very cordially Yours.

P.R. Uhler.

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P.S. I have a skeleton of a small Saurian?. from the "Laminated Sands" ready for your service, whenever you can call to take it. It is too frail to transport, being in laminae of clay set in fine white sand. It would have to be carried by hand. I am very desirous of finding some way to gently indurate these incoherent fossils and the matrix.

P.R. Uhler.