

November 2d, 1852.

Vice-President BRIDGES in the Chair.

Letters were read

From the Asiatic Society of Bengal, dated July 9th, 1852, acknowledging the receipt of the Journal of the Academy, vol. 2, part 2, and of the Proceedings vol, 6, part 1.

From the Chief Commissioners of H. M. Works and Public Buildings, dated London, Sept. 15, 1852, acknowledging the receipt of copies of the "Notice of the Academy by Dr. Ruschenberger," which have been deposited in the Museum of Practical Geology.

From M. Haidinger, dated Vienna, 20th April, 1852, transmitting the volumes acknowledged this evening.

From the Academy of Sciences of Vienna, dated October 3d, 1852, transmitting its works announced this evening.

November 9th.

Vice President BRIDGES in the Chair.

A letter was read from the Librarian of the British Museum, dated London, 21st Oct., 1852, acknowledging the receipt of recent Nos. of the Academy's Proceedings, &c.

Dr. Owen, in presenting to the Academy of Natural Sciences of Philadelphia a copy of the Geological Map of Wisconsin, Iowa and Minnesota, just published, made the following remarks:—

The region of country embraced in this geological map extends from latitude 38° to 49° , and from longitude $89^{\circ} 30'$ to $96^{\circ} 30'$. It has a length, from north to south, of 750 miles, and its greatest width 270 miles, the area being 200,000 square miles. Embracing the Mississippi river and all its tributaries, from its source to its junction with the Missouri; the Missouri river, as high as Council Bluff; the Red river of the north, from its source to the northern boundary of the United States; together with the northern and southern shores of Lake Superior, from Fond du Lac north to the British dominions, and east to the Michigan line.

All the calcareous rocks are represented on this map by tints of blue; the pure calcareous rocks being of pure blue tints, while the magnesio-calcareous or dolomitic rocks are of shades of purple blue; the sandstones, of yellow; the coal measures, of sepia; the metamorphic schists, of purple; the metamorphosed rocks, of Silurian date, of orange; while all the igneous rocks are of bright red colors.

A very large tract of the northern regions of this district, being more than one half of the country, is overspread with extensive drift deposits, penetrated only at a few limited and distant points, (these chiefly in the deep cuts of the streams,) by igneous rocks and metamorphic schists; except along the height of land dividing the waters of Lake Superior and the Mississippi; on the north west shore of Lake Superior and the region bordering on the British dominions, where the exposure of granite, gneiss, and metamorphic schists and trappose rocks, are rather more extensive.

The drift consists of deposits of sand, gravel clays of great thickness, of marls, and, locally, of erratic blocks. The summit levels of this region are from 500 to 1100 feet and more above Lake Superior.

A considerable portion of the southern and eastern part of this drift is based on the lowest protozoic sandstones of lower Silurian date; which formation is best explored in a semicircular belt east of the Mississippi and up the valley of the Wisconsin as high as Point Boss; and bearing northeast to the Michigan boundary line.

These lower Protozoic Sandstones have proved themselves far more fossiliferous than the corresponding strata in the State of New York—the Potsdam sandstone; having yielded, besides the two small *Lingulas*, *L. antiqua* and *prima*, of New York, four new genera of trilobites and at least nine or ten new species; which is the more remarkable since no remains of crustaceans had previously been found lower than the Trenton, Black river and Chazy limestones.

In the ascending order succeeds the Lower Magnesian Limestone, reaching the surface to the southwest of the Protozoic sandstones; characterized chiefly by gasteropodous mollusca, allied to *Pleurotomaria*, *Ophileta* and *Strapparolus*. They are represented by the deeper purple blue tints, and correspond in age to the calciferous sandrock of New York.

With the intervention of non-fossiliferous sandstones, from forty to eighty feet in thickness, often composed of limpid grains of quartz, there is superimposed on this formation, beds of shell-limestone of the age of the Trenton and Black river limestone of New York, and the blue limestones of Ohio and Indiana, containing *Leptaena alternata*, *sericea*, *deltoidea*, *Orthis testudenearea*, *occidentalis*, *subaequata*, *Atrypa capax*, *modesta*, *Isotelus gigas*, *Calymena senaria*, besides a great variety of other fossils found in the corresponding strata in Ohio, Indiana and New York, besides many new species. Though somewhat magnesian, these beds are the purest limestone of Silurian date in the district.

Next succeeds, on the south, the lead-bearing beds of the upper magnesian limestone, colored Prussian blue, and containing *Spirifer lynx*, *biforatus*, *Lingula quadrata* and a few other fossils of the Trenton limestone, Utica slate and Hudson river group. This formation is represented of a lighter shade of purple blue. This part of the Upper Magnesian Limestone of Wisconsin has yielded latterly upwards of 50,000,000 of pounds of lead annually, and is about three hundred feet thick.

The upper 200 feet of upper magnesian limestone of Wisconsin, form what we have designated the Coralline and Pentamerus beds, from the abundance of *Catenepora escharoides* and *Pentamerus oblongus*, formed towards the top of this formation, which corresponds to the Niagara and Clinton groups of New York.

To the southwest of this, crossing the Mississippi, near its upper or Rock-island rapids, is a very pure calcareous formation, containing *Atrypa reticularis*, *aspera*, *Orthis resupinata*, *Phocops macrophthalma*, and a variety of *Spirifers*, most of which are new species, allied to those of the Hamilton and Corniferous groups of New York, with extended hinge, and often with wide cardinal areas, and mostly smooth on the bourrelet or mesial fold. Also many of the corals found in the Onondaga limestone of New York and the limestones of the Eifel in Germany.

Much of the limestone of this formation has a close texture, smooth surface and conchoidal fracture, approaching to lithographic limestones.

The valley of the Mississippi, below Muscatine, is occupied by a zone of carboniferous limestone, which we divide into the upper and lower series, the former characterized by *Lithostrotion basaltiforme*, several species of *Productus*, the *Spirifers* and *Terebratulæ*; the latter by the *Archimedes*, a great variety of *Pentramites* and *Crinoidea*, *Productus punctatus*, *Spirifer cuspidatus*, *Spirifer striatus*, and remains of *Psammodus* and other fossil fishes; besides a variety of other species of organic remains. These beds of limestones encircle the Iowa and Missouri coal-field, and separate it from the Illinois coal-field, with which it may have been once in connection, before the denudation of the Mississippi Valley; but they are now separated by a belt of from 25 to 50 miles of this subcarboniferous limestone, now encroached upon only by a few outliers of the coal measures near the Keokuk rapids of the Mississippi.

The Iowa and Missouri coal-field, now for the first time laid down on a geo-

logical map, comprises in all about 50,000 square miles, nearly one half of which lies in Iowa, and the other half in Missouri. From north to south this coal-field is about 300 miles, and from east to west about 200.

This coal-field is shallow, hardly exceeding fifty fathoms, and the coal-bearing strata proper hardly 100 feet. It seems to be the attenuated part of the great coal-field east of the Mississippi. It contains from four to six workable beds of coal, which, in Iowa, vary from two to five or five and a half feet. Towards the southern margin of this coal-field, in Missouri, there are beds of great thickness—20 feet or more—of a character intermediate between cannel coal and asphaltum.

The coal of this coal-field is all highly bituminous and most slaty in its structure; very frequently presenting the woody fibre on the surface of the natural joints as distinctly displayed as on charcoal.

On the extreme south of this map will be observed, close to the southern margin of this coal-field, an uplift of magnesian limestone and sandstone of lower Silurian date, bordering on the lead region of Missouri, and to be found on both sides of the Missouri river, between Tavern Rock and Marion; here the carboniferous and lower Silurian rocks, are in close proximity and much blended together.

To the extreme west of the map, on the Missouri river, opposite the mouth of Floyd's river, the green represents the cretaceous formation which extends west of the Missouri river towards the heads of the Cheyenne, Moreau and White rivers, where it is succeeded by that remarkable Eocene tertiary basin in the Mauvaise Terres of Nebraska, containing those interesting extinct races of fossil mammalia described by Dr. Leidy in the Memoir forming part of the geological report.

Many important additions will be found to our geographical knowledge of the country, derived partly from drafts and astronomical observations made by the geological corps, and partly from the most recent linial surveys.

For further particulars I beg to refer the members to the forthcoming geological report of the surveys of the region of country represented by this geological map.

November 16th.

Vice-President BRIDGES in the Chair.

A note was read from Mr. Elias Durand, dated Nov. 15, 1852, accompanying his donation, acknowledged this evening, of 109 autographs of Scientific and Literary men.

Dr. B. H. Coates stated that he had been referred by a friend to a passage in page 136, of a work entitled "The Unity of the Human Races, proved to be the doctrine of Scripture, Reason and Science; by the Rev. Thomas Smyth, D. D. New York, 1850"—in which his name is cited, with those of several others, as that of an "opponent" of the doctrine or dogma of the Unity of the Human Species; and this on the authority of the late Dr. Morton. Dr. Coates had no recollection of the passage in any of the writings of his late honored friend just named, or of any other, in which such a statement had been made for him; and could only presume that Dr. Smyth has either misapprehended some expression in Dr. Morton's books, or has quoted from memory without referring to the text. Dr. Coates hoped to be allowed to have placed upon record in the Proceedings of the Academy an explicit denial of the above allegation, having never held the opinion there implied as his. He acquiesces in what he believes to be the general judgment of the most scientific men—the unity of the human species—without claiming to have formed an independent opinion; but he is not ignorant that some strangely marked varieties, as the Ethiopian, are of a very high antiquity.

The proposition frequently combined with the above, that the origin of the



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