

Address of H. S. Williams, Am. Assoc., 1892.) The *Icla* shales of Bolivia are Corniferous, and the *Huamampampa* sandstone is Hamilton.

In southwestern China Richthofen obtained from the Devonian beds the wide-range fossils *Pentamerus galeatus*, *Atrypa reticularis* var. *desquamata*, *Merista plebeia*, *Spirifer Verneuili* (= *disjunctus*), *Orthis striatula*, *Productus subaculeatus*, *Strophalosia productoides*, *Rhynchonella cuboides*, *R. pugnus*, *Aulopora tubiformis* (China, iv., 75).

Australian Devonian beds of the Rydal District, and to the north and south of it, have afforded the species *Cyathophyllum Damnoniense*, *Favosites reticulatus*, *F. fibrosus*, *Heliolites porosus*, *Chonetes Hardrensis*, *Orthis striatula*, *Rhynchonella pleurodon*, *R. pugnus*, *R. cuboides*, *Atrypa reticularis*, *Spirifer Verneuili*, and also the plant *Lepidodendron* (W. B. Clarke, *On. Sedim. Form. N.S.W.*, 4th edit., 1882). The Devonian occurs also in Queensland, and near Bathurst in Tasmania.

GEOLOGICAL AND GEOGRAPHICAL PROGRESS DURING THE DEVONIAN.

AMERICAN.

In the Devonian era, as in the Upper Silurian, the great rock formations that are open to investigation were the work of the Interior Continental waters. Progress was still, in the main, endogenous, or within the Interior Sea. No Paleozoic rocks, later than the Lower Silurian, have yet been reported from the Atlantic border, along the coast region of New Jersey and the states southward.

The confined condition of the *Eastern* Interior Sea, or Bay, had, with the progress of the era, an increasingly profound influence on the nature of the successive formations. The bay had its northwest passage over Michigan open, but not the northeast passage to Canada. The Devonian, as has been shown, began, like the Silurian, with beach and sea-border deposition, sparingly fossiliferous, marking off the coast-line on the north and northeast, and an off-shore bay-like formation — the Schoharie — bearing evidence of abundant life. But these rocks had acquired little thickness before the commencement of the Corniferous limestone formation, or rock coral-reef, when clearer waters, with growing Corals, Crinoids, Trilobites, and other species of the purer seas, were in great profusion, and spread from near the Hudson to Missouri and Iowa. The waters reached north to Mackinac, the head of a great Michigan bay of the era, but appear not to have covered northern Illinois or Wisconsin. Moreover, the Canada and New England seas also had their coral reefs.

It is remarkable that this coral-reef rock is not recognized over Pennsylvania and to the southwest. The Eastern Interior Sea had open connection with the Central Interior by the northwest. As to the southern entrance, nothing is known.

At the close of the Early Devonian the evidences of clear seas — the Corals and Crinoids, with most of the attendant life — disappear, migrating no one knows whither. Depositions of silt, mud, and sand prevail to the eastward with various alternations and but thin intercalations of limestone; and so it was also over the Central Interior, except sparingly in the Hamilton