B. *Cambrian and Silurian System.*—Almost contemporaneously with Sedgwick's and Murchison's famous researches in European areas, North American geologists were extending the knowledge of the vast tracts of older Palæozoic rocks in North America.

Between 1818 and 1832, A. Eaton published a series of pamphlets wherein he erroneously compared the sedimentary deposits in the east of the United States with the Mesozoic formations in Europe. Vanuxem in 1829 proved that the deposits in the east of the United States belonged exclusively to the "Transitional" series. In the following decade geological survey departments were established in several of the eastern and southern states, after the model of the British Geological Survey, and this gave a strong impulse to the development of Geology and Palæontology in North America. In New York State, the official surveys were commenced in the year 1836, and the survey department was divided into four independent sections. The South-Western Section was placed under the direction of Lieutenant Mather, the North-Eastern under Professor Ebenezer Emmons, the Middle Section under Conrad, and the Western Section under Vanuxem, who had been trained in Paris. In 1837 Conrad retired from active field-work on account of his health, and devoted himself to palæontological work. Vanuxem replaced him as director of the Middle Section, and J. Hall was given the Western Section.

Emmons, in 1842, published the general results obtained in the North-Eastern district, which in a large measure is composed of crystalline plutonic masses, gneiss, and crystalline schists. Among the sedimentary deposits, the "transitional" series has the widest extension. Emmons applied local names to the several divisions, calling the main complex of Palæozoic rock the "New York System," and sub-dividing it into four members irrespective of European classificatory groups—1, Champlain; 2, Ontario; 3, Helderberg; and 4, Erie Group. According to Emmons, the New York system was succeeded by the Old Red system, and rested upon the Taconic system. The latter reposed on the crystalline schists, and was said to consist of an unfossiliferous complex of slates, flagstones, limestone, and quartzite attaining a thickness of about 25,000 feet. The unfossiliferous complex was strongly contorted and disturbed, whereas the deposits of the New York system were almost horizontal.