

In the Eastern Alps true Carboniferous limestone was determined in Carinthia by Buch in 1824, but only received the vague name of "Transitional Limestone." De Koninck described the fauna of this limestone in 1873. In the Gail Valley and other localities of the Carnic Alps, the massive limestone is succeeded by dark shales and thin beds of limestone, wherein Tietze and Stache (1872) demonstrated the presence of fossil Foraminifera (*Fusulina*) in great abundance. The significance of this discovery was not fully realised until a few years later, when it was found that in Russia the true Carboniferous limestone with *Productus giganteus* is succeeded in the Moscow basin by limestones with *Spirifer Mosquensis*, and these are succeeded by a massive complex of strata comprising, both in the Ural and in the Donetz basins, coal-seams interbedded with massive *Fusulina* limestones. From the palæontological contents of this younger series in the Russian basins of deposition, V. von Möller concluded in the year 1875 that it was the equivalent of the Productive Coal-formation in Western Europe. Thus it was demonstrated that the Carboniferous system contained a definite palæontological sequence of extensive distribution.

In North America the Carboniferous formation has a wide surface outcrop, and as a rule consists of a Lower marine division (Sub-Carboniferous group) and an Upper productive division with coal-seams (Coal Measures). But in the Western States, especially in Illinois, Nebraska, and Missouri, beds of *Fusulina* limestone frequently replace the productive deposits or occur in alternation with them.

The Productive formation of the Carboniferous system has, on account of the great commercial value of the coal-seams, been examined in the very greatest detail not only in European lands but in all parts of the world. Survey maps of the coal-seams have been prepared on the largest scale, and afford evidence of the manifold diversity in the stratigraphical relations of the sandstone, conglomerates, shales, and coal-seams, and of the repeated tectonic disturbances to which in many districts these strata have been subjected since their original deposition as horizontal sheets of deposit.

In Germany the Saar basin has been mapped by Von Dechen and Nasse, the Westphalian Coal-formation by Lottner (1868), and the Carboniferous deposits in the Halle district have been surveyed and described by Laspeyres (1875).