

well developed, while the supposed lower gneiss, on account of its great development about the head waters of the Ottawa River was known afterwards by the name of "Ottawa gneiss." As a result of later investigations, in other parts of Canada, Vennor came to the conclusion that the higher division rested unconformably upon the lower gneiss. Whether therefore we have two distinct and unconformable series or not is a point which is not as yet conclusively determined. The facts hitherto collected, however, would rather indicate that the two are distinct. In the present essay these two names (Grenville series and Ottawa gneiss) will be employed to designate these two developments of the Laurentian respectively, and it may be here remarked that whether they be conformable or unconformable, considered from the economical standpoint, there is a very marked difference between them. The Grenville division with its crystalline limestones, quartzite, &c., carries apatite, graphite, iron ores, mica and in general all the important mineral deposits of the Laurentian, while the Ottawa gneiss, as far as we at present know, carries but little in the way of valuable minerals.

In the Grenville series we find also the earliest traces of life on our planet, since the undoubted occurrence of larger as well as smaller limestone beds which so frequently alternate with the gneiss of this series can only be explained by organic agencies. The presence of a considerable admixture of graphite, which in many of these limestones occurs in a finely disseminated condition, and is also found in many cases in the associated gneisses, is a further important testimony in the same direction. Many of these limestones resemble precisely some of younger age where these have been metamorphosed by contact with eruptive rocks. The carbon of the limestone crystallizes as graphite in these cases, and the clayey substances, take the form of small scales of mica or grains of other minerals. Veins of graphite appear likewise, though sparingly, in these Laurentian limestones and correspond to the veins and strings