

The rocks at present found in the district embrace only a fragmentary remnant of those formed at this early time, a great thickness of other rocks having been laid down above them and later worn away. Twenty thousand to twenty-five thousand feet is not an exaggerated estimate of this thickness. It is not meant to imply that a uniform amount has been removed from the whole district, in fact there is every reason to believe that the opposite is true, that the region has been for much of its history a rugged one, and that much greater removal has taken place from the heights than from the depressions. While this accumulation of the rocks which have since disappeared was in progress, the region was in all probability below sea level and keeping pace with the deposit by a slow subsidence. Not improbably a great part of the accumulated thickness consisted of igneous rocks.

Great igneous intrusions. After the present surface rocks had become deeply buried, they were invaded from beneath by a series of great igneous intrusions, broken up into patches and no doubt pushed upward to a considerable extent. At the time of the appearance of these intrusions the previous rocks had become profoundly changed in character, so that they were much in their present condition. The district embracing Essex, southern Franklin and northern Hamilton counties felt the full force of this invasion, the larger part of the present surface rocks in that district consisting of these igneous rocks, while away from it they occur merely in patches. The present rocks cooled far beneath the old surface and have been brought to the present one by wear and removal of the overlying rocks. They represent abyssal, cooled masses, whence no doubt much molten material ascended toward, and not improbably to, the old surface.

These rocks may be grouped into four great classes, anorthosites, syenites, granites and gabbros, all undoubtedly derived from some great parent molten mass below by some process of differentiation. The anorthosite intrusion was the first, the bulkiest, and is the only one whose precise limits have so far been worked out. It was followed by one of syenite, that by one of granite, and the gabbro intrusion seems to have been latest of all.