greywacke passing upward into slate. The total thickness of the formation is also very much less. Any theory of origin must account for these remarkable changes in the character and thickness of the sediments within a distance of a few miles.

The nature of the Kiask sediments indicates that they were accumulated rapidly and did not undergo much wear between their source and the place of their deposition; and that the rocks of whose fragments they are composed underwent rapid mechanical disintegration unaccompanied by chemical decomposition through the ordinary processes of weathering. Rapid accumulation is indicated by the angularity of the pebbles in the conglomerate, by the characteristic occurrence of sharp angles and chisel edges in the fragments of the grits and arkoses, and probably by the unbedded nature of the greywacke of the Bannockburn area. Lack of bedding in muds is characteristic of deposits that have accumulated either very rapidly or else in very shallow water. Rapid disintegration of the parent rocks is indicated by the uniform arkose-like composition of the sediments from the coarsest to the finest. When disintegration occurs under normal present day conditions, vegetation keeps the detritus from being washed away until the action of the weather has rotted the rocks more or less completely, with formation of such products as kaolin, chlorite, iron oxides, and quartz. These are mechanically separated during erosion, and are deposited in separate beds as sandstones and clays, whereas the lime and magnesia, which are carried off as soluble bicarbonates, are precipitated by various means as limestones. In the Kiask series the rocks are composed of the fresh or slightly altered detritus of the parent rocks, instead of being sandstones, clays, and limestones; so that the disintegration of the original rocks must have been closely followed by the removal of the disintegrated material. We can infer, therefore, with some certainty, that vegetation was lacking and, since a low lying land would not furnish coarse detritus rapidly, that the area from which the sediments came was hilly, perhaps mountainous.

We have, therefore, a series showing evidences of rapid accumulation without much weathering of the original rocks; with wide variations in apparent thickness within short distances; and with the peculiarity of being composed of granite debris at the base, of greenstone debris in the middle, and of rhyolite debris in the upper horizons. The first quality, as indicated in the preceding paragraph, implies a hilly or mountainous country, bare of vegetation, supplying the sediments. The variations in thickness are characteristic of deposits formed by torrential streams descending from a mountainous country. A mountainous hinterland is thus implied from two lines of evidence. Incidentally, deposits formed by torrential streams frequently possess an original depositional dip. If this was the case in the Midlothian area, the real thickness of the sediments will be much less than the apparent thickness, which is calculated on the assumption that the beds were originally laid down flat. The third quality mentioned above, that of the peculiar separation of the rock materials composing the Kiask sediments, is more difficult to explain. The explanation may be, perhaps, that a gradual uplift of the hinterland was going on, exposing new rocks to erosion.

The great thickness of the conglomerate beds around Fault lake, and the rapid decrease in the thickness to the east and west, suggest that the