vegetable muck accumulated in ponds and similar places. Such vegetable matter, once accumulated, requires only pressure and the changes which come of its own slow putrefaction to be converted into coal.

But in order that it may accumulate at all, certain conditions are necessary. The first of these includes the climatal and organic arrangements necessary for abundant vegetable growth. The second is the facility for the preservation of the vegetable matter, without decay or intermixture with earthy substances; and this, for a long time, till a great thickness of it accumulates. The third is its covering up by other deposits, so as to be compressed and excluded from air. It is evident that when we have to consider the formation of a bed of coal several feet in thickness, and spread, perhaps, over hundreds of square miles, many things must conduce to such a result, and the wonder is perhaps rather that such conditions should ever have been effectively combined. Yet this has occurred at different periods of geological history and in many places, and in some localities it has been so repeated as to produce many beds of coal in succession.

Let us now question our block of coal as to its origin, supposing it to be a piece of ordinary bituminous coal, or still better, a specimen of one of the impure somewhat shaly coals which one sometimes finds accidentally in the coal bin. In looking at the edge of our specimen we observe that it has a "reed" or grain, which corresponds with the lamination or bedding of the seam of coal from which it came. Looking at this carefully, we shall see that there are many thin layers of bright shining coal, and the more of these usually the better the coal. These layers, in tracing them along, we observe often to thin out and disappear. They are not very continuous. If our specimen is an impure coal, we will find that it readily splits along the surfaces of these layers, and that when so split, we can see that each layer of shining coal has certain markings, perhaps the flattened