with broad lateral wings for flotation in the air, or in some cases with a pulpy envelope, which flattens into a film. There seem to have been structures of both these kinds, though in the state of preservation of these curious seeds it is extremely difficult to distinguish them. In the first case they must have been intended for dissemination by the wind, like the seeds of spruces. In the latter case they may have been disseminated like the fruits of taxine trees by the agency of animals, though what these were it would be difficult to guess. These trees had very great reproductive power, since they produced numerous seeds, not singly or a few together, as in modern yews, but in long spikes or catkins bearing many seeds (Fig. 59).

It is to be observed that the Cordaites, or the *Cordaitinæ*, as they have been called, as a family,* constitute another of those intermediate groups with which we have already become familiar. On the one hand they approach closely to the broader-leaved yews like Gingko, Phyllocladus, and Podocarpus, and, on the other hand, they have affinities with Cycadaceæ, and even with Sigillariæ. They were beautiful and symmetrical trees, adding something to the variety of the rather monotonous Palæozoic forests. They contributed also somewhat to the accumulation of coal. I have found that some thin beds are almost entirely composed of their leaves, and the tissues of their wood are not infrequent in the mineral charcoal of the larger coal-seams. There is no evidence that their roots were of the stigmaroid type, though they evidently grew in the same swampy flats with the Sigillariæ and Calamites.

It may, perhaps, be well to say here that I believe there was a considerably wide range of organisation in the Cordaitinæ as well as in the Calamites and Sigillariæ, and that it will eventually be found that there were three lines

* Engler; Cordaitées of Renault.