viewed as transparent objects, appear yellow like amber, and show little structure, except that the walls can, in some cases, be distinguished from the internal cavity, and the latter may be seen to inclose patches of flocculent or granular matter. In the shale containing them there are also vast numbers of rounded translucent granules which may be the escaped spores.

The bed at Kettle Point is stated in the report of the Geological Survey to be 12 to 14 feet in thickness; but to what degree either in its thickness or horizontal extent it retains the characters above described, I do not know. It belongs to the Upper Devonian, being supposed to be a representative of the Gennessee slates of New York. It contains stems of *Calamites inornatus* and of a *Lepidodendron*, obscurely preserved, but apparently of the type of *L. Veltheimianum*, and possibly the same with *L. primævum* of Rogers. The spore-cases are not improbably those of this plant, or of the species *L. Gaspianum*, which belongs to the same horizon, though not found at this locality. The occurrence of this bed is a remarkable evidence of the abundance of Lycopodiaceous trees, whose spores must have drifted in immense quantities in the winds, to form such a bed. It is to be observed, however, that this is not a bed of coal, but a bituminous shale of brown color, and with pale streak, no doubt accumulated in water, and even marine, since it contains *Spirophyton** and shells of *Lingula*. In this it agrees with the Australian Tasmanite, which though composed in great part of spore-cases of Ferns, is, as I am informed by Mr. Selwyn, an aqueous deposit, containing marine shells.

There is, however, one bed of true coal known in the Devonian of Eastern America, that of Tar Point, Gaspé, and it is curious to observe that this is not composed of spore-cases, but of successive thin layers of rhizomata and stems of *Psilophyton*, with occasional fragments of *Lepidodendron* and *Cyclostigma*. Rounded disks which may be spore-cases, occur in it, but very rarely. In the bituminous shales associated with this coal, the microscope shows amber-colored flakes of irregular form, but these are easily ascertained to be portions of the epidermis of Psilophyton, or of the chitinous crusts of crustaceans which abound in these beds.

Ascending to the Lower Carboniferous (sub-carboniferous), there are great quantities of rounded spore-cases of the size of

* The well known *Cauda-galli* fucoid.