materials of this kind should constitute considerable portions of such vegetable accumulations as the beds of coal, and that when present in large proportion they should afford richly bituminous beds. All this agrees with the fact, apparent on examination of the common coal, that the greater number of its purest layers consist of the flattened bark of *Sigillariæ* and similar trees, just as any single flattened trunk embedded in shale becomes a layer of pure coal. It also agrees with the fact that other layers of coal, and also the cannels and earthy bitumens, appear under the microscope to consist of finely comminuted particles, principally of epidermal tissues, not only from the fruits and spore-cases of plants, but also from their leaves and stems. These considerations impress us, just as much as the abundance of spore-cases, with the immense amount of the vegetable matter which has perished during the accumulation of coal, in comparison with that which has been preserved.

I am indebted to Dr. T. Sterry Hunt for the following very valuable information, which at once places in a clear and precise light the chemical relations of epidermal tissue and spores with coal. Dr. Hunt says: "The outer bark of the cork-tree, and the cuticle of many if not all other plants, consists of a highly carbonaceous matter, to which the name of *suberin* has been given. The spores of *Lycopodium* also approach to this substance in composition, as will be seen by the following, one of two analyses by Duconi,* along with which I give the theoretical composition of pure cellulose or woody fibre, according to Payen and Mitscherlich, and an analysis of the suberin of cork, from *Quercus suber*, from which the ash and 2·5 per cent of cellulose have been deducted.†

* Liebig and Kopp, "Jahresbuch," 1847–'48.

† Gmelin, "Handbook," xv., 145.