In *Sigillariæ*, *Lepidodendra*, &c., the following surfaces of the stem may be presented to our inspection:

1. The outer surface of the epidermis without its leaves, but with the leaf-bases and leaf-scars more or less perfectly preserved. On this surface we may recognise: (1) Cellular swellings or projections of the bark to which the leaves are attached. These may be called *leaf-bases*, and they are sometimes very prominent. (2) The actual mark of the attachment of the leaf situated in the most prominent part of the leaf-base. This is the *leaf-scar*. (3) In the leaf-scar when well preserved we can see one or more minute punctures or prominences which are the points where the vascular bundles passing to the leaf found exit. These are the *vascular scars*.

When the leaves are attached, the leaf-scars and vascular scars cannot be seen, but the leaf-bases can be made out. Hence it is important, if possible, to secure specimens with and without the leaves. In flattened specimens the leaf-bases are often distorted by pressure and marked with furrows which must not be mistaken for true structural characters. The leaf-bases, which are in relief on the outer surface of the stem, of course appear as depressions on the mould in the containing rock, in which the markings often appear much more distinctly than on the plant itself.

2. The outer surface of the epidermis may have been removed or may be destroyed by the coarseness of the containing rock. In this case the leaf-bases are usually preserved on the surface of the outer or corky bark, but the leaf-scars and vascular scars have disappeared. This gives that condition of Lepidodendroid trees to which the name *Knorria* has been applied. When plants are in this state careful inspection may sometimes discover traces of the leaf-scars on portions of the stem, and thus enable the *Knorria* to be connected with the species to which it belongs.

3. The outer or corky bark may be removed, exposing the surface of the inner or fibrous and cellular bark, which in the plants in question is usually of great thickness. In this case neither the leaf-bases nor the scars are seen, but punctures or little furrows or ridges appear where the vascular bundles entered the inner bark. Specimens in this state are usually said to be decorticated, though only the outer bark is removed. It is often difficult to determine plants in this condition, unless some portion of the stem can be found still retaining the bark; but when care is taken in collecting, it will not infrequently be found that the true outer surface can be recovered from the containing rock, especially if a coaly layer representing the outer bark intervenes between this and the inner impression. Speci-