

tion to be compared with the one so frequently observed in the *Dicotyledones*. One of the most striking peculiarities noticeable in the seedlings of the *Dicotyledones* is the remarkable contrast between the shape of the cotyledons, especially the epigeic, and the final leaves, and it seems almost impossible to bring these into actual correlation. The diversity of form in the cotyledons is quite considerable, even if their shape be usually much simpler than that of the ultimate leaves, a simplification which may have been produced by arrest, rather than being an indication of leaf-forms that characterized the species in by-gone years, as suggested by some authors. Considered by themselves the epigeic cotyledons represent a multitude of forms, of which the following may be enumerated: "linear" in *Claytonia megarhiza* Parry, *Menispermum Canadense* L., *Negundo aceroides* Moench, *Acer saccharinum* Wang; "narrow lanceolate" in *Platanus occidentalis* L.; "ovate" in *Vitis riparia* Michx., *V. æstivalis* Michx., *Ampelopsis quinquefolia* Michx., *Clitoria Mariana* L.; "obovate" in *Rhus copallina* L.; "obovate with auriculate base" in *Carpinus Caroliniana* Walt.; "oblong" in *Cornus florida* L., *Celastrus scandens* L., *Liquidambar Styraciflua* L.; "elliptic" in *Diospyros Virginiana* L., *Liriodendron Tulipifera* L., *Sanicula Marylandica* L., *Thaspium barbinode* Nutt.; "spathulate" in *Ambrosia trifida* L.; "oval" in *Rhus Toxicodendron* L.; "reniform" in *Helcoma pulegioides* Pers., *Geranium maculatum* L.; "rotund" in *Cassia chamaecrista* L.; "bifid" with diverging broad globes in *Ipomœa leptophylla* Torr., *I. hederacea* Jacq.; "bifid" with diverging linear lobes in *Eschscholtzia Californica* Cham.; "palmately five-lobed" in *Tilia Americana* L., and finally "bipartite with diverging rounded lobes", making the leaf almost obcordate as in *Catalpa bignonioides* Walt. (Fig. 23); in *Aralia spinosa* L. (Fig. 26) the cotyledons are very unequal, the one being obovate, and entire, the other ovate with the margins serrate, thus imitating the outline of the leaflets of the mature tree; such distinction in structure is, otherwise, very seldom met with, while some modification in size, but not in outline, has been observed in cotyledons of several herbs. We have, thus, in the epigeic cotyledons a number of leaf-types which correspond with those of mature plants, herbs and trees, with the only exception, so far as I know, of the decompound. If we, on the other hand, examine the hypogeic cotyledons we notice in these hardly any variation worth speaking of, since these mostly remain enclosed by the seed; they are usually fleshy, entire, and vary only in length and width, from linear to oblong, etc.

To classify the dicotyledonous seedlings is a most difficult task, difficult to the same extent as it is to classify the mature