

plants; as a slight difference in the nature of the poison suffices to produce widely different results; and lastly, as we know that the chemical compounds secreted by plants are eminently liable to be modified by changed conditions of life, we may believe it possible that various parts of a plant might be modified through the agency of its own altered secretions. Compare, for instance, the mossy and viscid calyx of a moss-rose, which suddenly appears through bud-variation on a Provence-rose, with the gall of red moss growing from the inoculated leaf of a wild rose, with each filament symmetrically branched like a microscopical spruce-fir, bearing a glandular tip and secreting odoriferous gummy matter.<sup>54</sup> Or compare, on the one hand, the fruit of the peach, with its hairy skin, fleshy covering, hard shell and kernel, and on the other hand one of the more complex galls with its epidermic, spongy, and woody layers, surrounding tissue loaded with starch granules. These normal and abnormal structures manifestly present a certain degree of resemblance. Or, again, reflect on the cases above given of parrots which have had their plumage brightly decorated through some change in their blood, caused by having been fed on certain fishes, or locally inoculated with the poison of a toad. I am far from wishing to maintain that the moss-rose or the hard shell of the peach-stone or the bright colours of birds are actually due to any chemical change in the sap or blood; but these cases of galls and of parrots are excellently adapted to show us how powerfully and singularly external agencies may affect structure. With such facts before us, we need feel no surprise at the appearance of any modification in any organic being.

I may, also, here allude to the remarkable effects which parasitic fungi sometimes produce on plants. Reissek<sup>55</sup> has described a *Thesium*, affected by an *Cecidium*, which was greatly modified, and assumed some of the characteristic features of certain allied species, or even genera. Suppose, says Reissek, "the condition originally caused by the fungus to become constant in the course of time, the plant would, if found growing wild, be considered as a distinct species or even as belonging to a new genus." I quote this

<sup>54</sup> Lacaze-Duthiers, *ibid.*, pp. 325, 328.

<sup>55</sup> 'Linnæa,' vol. xvii., 1843; quoted

by Dr. M. T. Masters, Royal Institution, March 16th, 1860.