

try to begin everything, and follow all lines of investigation, he would soon be hopelessly stranded and become disgusted at the impossibility of his undertaking. One should rather take up a small area, the smaller the less his time is, and he may obtain gratifying results. If you cannot take up botany entire, or dendrology, or herpetology or ichthyology, etc., take up a small item in one or more of these, *e. g.* the study of mosses or lichens or mushrooms, or begin with a family of trees or birds or fishes or insects. There are few, even among the most common insects or birds or mammals, whose life history is entirely and completely known.

Furthermore there is *concentration*, in which must be included thoroughness and patience. One must concentrate his mind on the chosen study, and give it his best efforts. He must not be superficial but thorough in his observations. He must not jump at conclusions. That is extremely dangerous. Science does not want it, although many scientific men indulge in it. Science is derived from the Latin *scio*, to know; it must deal with *facts* only. So, painstaking, laborious investigation and observation is wanted, not half-observed phenomena and guesses. Sometimes an infinite amount of patience is required. Think of John Burroughs digging away two or three tons of earth in order to understand the ways of a weasel's underground home! Or Audubon, now in the far west, now in Labrador, now in the limitless forests of Kentucky or the impenetrable mangrove thickets of the gulf coast, in heat and cold, observing, sketching, recording. If a bird or insect with which one wishes to become acquainted flies into a thicket or swamp, it will not do to remain outside; it means to follow it up at the risk of ruffling one's clothes and temper.

Coupled with thoroughness must be *exactness*. A student may be thorough, not spare himself labor and exertion, and yet not be exact in getting at his results or recording them. If he sees a certain damage done to a plant by insects, and finds an insect on the plant, it would not do to assume that this is the author of the harm until he sees it at work. The same holds good in all other branches. One must have a sense of responsibility, feeling that by inexactness he may cause people to believe and circulate untruth, which would always be harmful, leaving aside the moral issue.

And last but not least, a conscientious, patient, systematic student of nature should consider it his duty to *make the results of his labors accessible* to others, to science in general. If a per-