

though the act is instinctive and involves neither practise nor imitation, it is not absolutely perfect; leaves have been found cut in more than one place and then abandoned as unsatisfactory.

There is a very interesting account of a British leaf-roller (*Rhyrchites betulae*) given by Sharpe in the Cambridge Natural History. The female beetle goes to the margin of the leaf, at the base, but some way out from the stalk, and cuts through the leaf from the margin to the mid-rib somewhat in the shape of an upright letter S; it then crosses the mid-rib and cuts through the other half of the leaf to the margin, somewhat in the shape of a prostrate letter S. The beetle then returns to the margin, where it begins cutting, and, much as a grocer makes a paper funnel for sugar, rolls the edge over round an ideal axis till it brings it to the mid-rib; here it holds the funnel in position with the legs of one side, while with the other three it draws the further side of the leaf towards it and wraps it around the part of the funnel already formed. When it finds the material stiff to work with, it bites the surface of the leaf with its mandibles or pushes it into position with its feet, adjusting means to end like a sailor at work in the shrouds furling canvas. It then enters the funnel, bites two or three small pits into the leaf, deposits an egg in each, and, then emerging, completes the funnel by folding over and tucking in the tip of the leaf.

Mr. Sharpe, in comment, points out that the insect has never seen a funnel in its life, and yet manages to make one perfectly the very first time of trying. But the author's perplexity is partly due to his confusing a purely instinctive act with an act of intelligence (vide the Peckham's book on Wasps). How can an insect be a highly-skilled engineer, working with mathematical accuracy and on a scientific plan? It is an insoluble problem if you try to state your answer in terms of intelligence and individual consciousness. But place it among impulsive acts, involuntary and more or less mechanical, common to all members of the species, and you can give a fairly satisfactory explanation in terms of instinct.

Among insects especially are found instincts whose perfection is simply diabolical, often involving a highly-complex series of acts performed but once in the whole lifetime of the individual, and therefore admitting of neither practise nor imitation. To look upon such acts as the result of conscious intelligence is absurd; the intellect has no place here, and would be simply a meddler, likely to bungie and make a botch of the artificer's work. On the other hand, a whole-hearted Darwinian like Weidmann has no difficulty in applying his great principle of selection to such an act, and