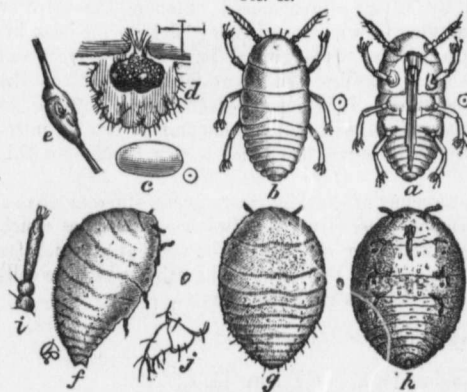


little oval, hexapod beings, which differ from their mother in their bright yellow colour and more perfect legs and antennæ, the tarsi being furnished with long, pliant hairs, terminating in a more or less distinct globule. In hatching, the eggs split longitudinally from the anterior end, and the young louse whose pale yellow is in strong contrast with the more dusky colour of the egg-shell, escapes in the course of two minutes. Issuing from the mouth of the gall, these young lice scatter over the vine, most of them finding their way to the tender terminal leaves, where they settle in the downy bed which the tomentose nature of these leaves affords, and commence pumping up and appropriating the sap. The tongue-sheath is blunt and heavy, but the tongue proper—consisting of three brown, elastic and wiry filaments, which, united, make so fine a thread as scarcely to be visible with the strongest microscope—is sharp, and easily run under the parenchyma of the

FIG. 43.



TYPE GALLÆCOLA:—a, b, newly-hatched larva, ventral and dorsal view; c, egg; d, section of gall; e, swelling of tendril; f, g, h, mother gall-louse—lateral, dorsal and ventral views; i, her antenna; j, her two jointed tarsi. Natural sizes indicated at sides.

leaf. Its puncture causes a curious change in the tissues of the leaf, the growth being so stimulated that the under side bulges and thickens, while the down on the upper side increases in a circle around the louse, and finally hides and covers it as it recedes more and more within the deepening cavity. Sometimes the lice are so crowded that two occupy the same gall. If, from the premature death of the louse, or other cause, the gall becomes abortive before being completed, then the circle of thickened down or fuzz enlarges with the expansion of the leaf, and remains (Fig. 43, c) to tell the tale of the futile effort. Otherwise, in a few days the gall is formed, and the inheld louse, which, while eating its way into house and home, was also growing apace, begins a parthenogenetic maternity by the deposition of the fertile eggs, as her immediate parent had done before. She increases in another in quick succession, until the gall is crowded. The mother dies and shrivels, and the young, as they hatch, issue and found new galls. This process continues during the summer until the fifth or sixth generation. Every egg brings forth a fertile female, which soon becomes wonderfully prolific. The number of eggs found in a single gall averages about 200; yet it will sometimes reach as many as 500, and, if Dr. Shimer's observations can be relied on, it may even reach 5,000. I have never found any such number myself; but, even supposing there are but five generations during the year, and taking the lowest of the above figures, the immense prolificacy of the species becomes manifest. As summer advances they frequently completely cover the leaves with their galls, and settle on the tendrils, leaf-stalks and tender branches, where they also form knots and rounded excrescences (Fig. 43, e) much resembling those on the roots. In such a case, the vine loses its leaves prematurely, usually, however, the natural enemies of the louse seriously reduce its numbers by the time the vine ceases its growth in the fall, and the few remaining lice, finding no more succulent and suitable leaves, seek the roots. Thus by the end of September, the galls are mostly deserted, and those which are left are almost always infested with mildew, and eventually turn brown and decay. On the roots the young lice attach themselves singly or in little groups and thus hibernate. The male louse has never been seen, nor does the female ever acquire wings. Indeed, too much stress cannot be laid on the fact that *Gallæcola* occurs only as an agamic and apterous female form. It is but a transient summer state, not at all essential to the perpetuation of the species, and does, compared with the other type, but trifling damage. It has been found occasionally by Mr. Riley on all species of the grape-vine (*vinifera*, *riparia*, *estivalis* and *Labrusca*) cultivated in the Eastern and Middle States, and on the wild *cordifolia*; but it flourishes only on the river-bank grape (*riparia*), and more especially on the Clinton and Taylor, with their close allies. Thus while legions of the root-inhabiting type (*radicicola*) are overrunning and devastating the vineyards of France, this one is almost unknown there except on such American varieties as it infests with us."

"TYPE
gallæcola ex



TYPE RADICICOLA of swellings to b, larva as it appears same; e, f, g, for i, tubercle; j, trail in the spring one mother, are less numerous form, and is roots, such as tinetly shagreen a good lens, a which were quite as in *gallæcola* more degrade females of which born."

"The sex when once increase rather little dusky which is soon a short time, vines, and finally tubercled skin neither tubercle

"The wire early as the first are females, which invariably befall to the light, or

"As fall sets in only eggs. These last die with here and the body and life of thousands

* "It is not that they can always the more perfect o