

This article was downloaded by: [McGill University Library]
On: 26 January 2015, At: 13:50
Publisher: Taylor & Francis
Informa Ltd Registered in England and Wales Registered Number:
1072954 Registered office: Mortimer House, 37-41 Mortimer
Street, London W1T 3JH, UK



Annals and Magazine of Natural History: Series 5

Publication details, including instructions for authors and subscription information:
<http://www.tandfonline.com/loi/tnah11>

The migrations of the aphids of the red galls of *Ulmus campestris* (*Tetraneura rubra*, Lichtenstein)

M. Lichtenstein

Published online: 07 Oct 2009.

To cite this article: M. Lichtenstein (1883) The migrations of the aphids of the red galls of *Ulmus campestris* (*Tetraneura rubra*, Lichtenstein), *Annals and Magazine of Natural History: Series 5*, 11:62, 144-146, DOI: [10.1080/00222938309459114](http://dx.doi.org/10.1080/00222938309459114)

To link to this article: <http://dx.doi.org/10.1080/00222938309459114>

PLEASE SCROLL DOWN FOR ARTICLE

Taylor & Francis makes every effort to ensure the accuracy of all the information (the "Content") contained in the publications on our platform. However, Taylor & Francis, our agents, and our licensors make no representations or warranties whatsoever as to the accuracy, completeness, or suitability for any purpose of the Content. Any opinions and views expressed in this publication are the opinions and views of the authors, and are not the views of or endorsed by Taylor & Francis. The accuracy of the Content should not be relied upon and should be independently verified with primary sources of information. Taylor and Francis shall not be

liable for any losses, actions, claims, proceedings, demands, costs, expenses, damages, and other liabilities whatsoever or howsoever caused arising directly or indirectly in connection with, in relation to or arising out of the use of the Content.

This article may be used for research, teaching, and private study purposes. Any substantial or systematic reproduction, redistribution, reselling, loan, sub-licensing, systematic supply, or distribution in any form to anyone is expressly forbidden.

Terms & Conditions of access and use can be found at <http://www.tandfonline.com/page/terms-and-conditions>

From this very brief sketch it will be seen that the work is hardly for beginners; at any rate, many advanced students will find in it much of value and interest. And, indeed, from what we know of English students, we doubt whether (with all respect for our authors) the younger, at any rate, would not be repelled by it from the study of comparative anatomy. The following sentence (p. 301) is no unfair example of their style:—

“DUCTUS STENONIANUS.—Stenon’s duct, duct of the parotid gland (fig. 87). It extends cephalad from the cephalic edge of the gland along the ectal surface of the masseter muscle, nearly directly toward the angle of the mouth. When near the edge of the lip it penetrates the cheek, passing entad of the facial vein (fig. 87, V. facialis). It opens on the mucous surface of the cheek opposite the most prominent cusp of the last præmolar (fig. 57).”

We are far from saying that we look with any thing like dissatisfaction on the use of technical terms, that we do not recognize their value, or the weight of the arguments brought by the present authors in defence of their treatment of the subject; nor do we fail to recognize the important services rendered to morphological and descriptive anatomy by Barclay and Owen, and those who have followed these masters; nor do we say that we do not sympathize with the remarks made in the volume before us rather than with those of quite an opposite tendency which have been made by Mr. Lyman in his Introduction to the Ophiurids of the ‘Challenger’ expedition; but we recognize just as much that strong meat is not for babes, that the commencing zoologist, who should also be being introduced to the elements of botany, has of necessity quite enough technical terms to learn, and that it is the business of the teacher to relieve him wherever and whenever he can. In other words, the investigation and the discussion of morphological and zoological problems is aided by the appropriate use of technical and substantive terms, in place of periphrases and adaptations; but early study, and a knowledge of the elementary characters of natural objects are most successful when the objects themselves are veiled as little as may be in terms which distract the attention and load the memory.

To those who can bear with them, we are glad to be able to introduce this work.

MISCELLANEOUS.

The Migrations of the Aphis of the Red Galls of Ulmus campestris
(*Tetraneura rubra*, *Lichtenstein*). By M. LICHTENSTEIN.

THE new theories upon the biological evolution of the Aphides, to which I have been led by my long-continued investigations of those insects, although strongly contested at Paris, have made way in

other countries, and begin to be generally accepted, having been confirmed by such observers as Targioni-Tozzetti, Kessler, Buckton, Horvath, Riley, &c. Nevertheless the facts supporting those theories are still scattered; for, although it is indisputable that the *Phylloxera* of the oak, of Boyer de Fonscolombe, passes from *Quercus coccifera* to *Quercus pubescens*—although Targioni was able to show to his colleagues at Florence *Phylloxera florentina* passing from *Quercus ilex* to *Quercus sessiliflora*—although Planchon, Signoret, Cornu, Riley, and twenty more have seen *Phylloxera vastatrix* pass from the leaf-galls to the roots of the vine, the history of the metamorphoses of the other Aphides has not been much advanced; and it is a very curious thing that the biological evolution of the genus *Phylloxera* and of an American species of that genus is much better known to us than that of the Aphides of the poplar or the elm, although they occur by thousands of millions every year upon those common trees, defying the unfortunate entomologists who have sought to trace them ever since the days of Réaumur and Linné, and even long before them.

Various indications had indeed led me to suppose that several of these Aphides must, like *Phylloxera*, have a phase in their lives when they become radicolar. Experiments in feeding the Aphides originating from the winged forms issuing from the galls of the *Lentiscus* upon the roots of grasses, made at Montpellier by M. Courchet and myself, were partially successful. Further, I had found upon these same roots the winged pupiferous form of *Aploneura lentisci*, which is very easy to recognize, because it is the Pemphigian or gall-aphis that carries its wings flat, like *Phylloxera*; but as regards the Aphides of the galls of the poplar and elm nothing has hitherto been discovered.

The Aphides which form these galls belong to three different genera:—

Pemphigus, represented by about 25 species;
Schizoneura, represented by 9 or 10 species; and
Tetraneura, of which we know only 2 species.

In deciding to trace these last two Aphides, which are called *Tetraneura ulmi*, forming a smooth green gall upon the leaves of the elm, and *Tetraneura rubra*, Licht., which forms a bright red rugose and curly gall, I had more chance of attaining my object than if I had attacked genera with more numerous species, in which it would have been very difficult for me to refer the subterranean to the corresponding aerial species. Moreover the course was to some extent cleared. At the end of the last century (1770) Von Gleichen had carried on day by day for eight years observations upon *Tetraneura ulmi* during its aerial evolution without discovering any thing; in resuming these investigations after one hundred years I had discovered under the bark of elms the female of this species, with its encysted egg in its body. Prof. Kessler, of Cassel, made a step in advance of this, and found the winged pupifer bringing the sexual

forms onto the elms, and was enabled to figure this form and that of the males and females; but he did not know whence it came, nor does any one yet know.

But this present year, vigorously assisted by my young pupil and collaborator, M. Franz Richter, I have examined thousands of the root-tufts of all our wild grasses; and among numerous examples of *Pemphigus* and *Schizoneura*, the history of which will come later on, we found on the roots of *Triticum repens* a colony of *Tetraneura* with the winged forms, easily recognized by the single vein in their hind wings, whereas the other Pemphigians have two. Placed carefully in tubes, these winged forms furnished sexual forms; they are therefore the *pupiferous* form. We set to work to examine the trunks of the elms growing in the neighbourhood, and under their bark we found the same winged forms busy furnishing the trees with the same sexual forms that the Aphides collected from the grass-roots had produced in the tubes. We compared these insects with the figures that Kessler has given of *Tetranzura ulmi*; the antennæ were different, and resembled those of *Tetraneura rubra* of the *emigrant* form, *i. e.* that which quitted the red galls between the 1st and 15th of June.

Hence there was no more doubt, and the evolution of the red galls of the elm has no longer any gaps.

The fecundated egg passes the winter under the bark encysted in the body of the female.

This egg hatches in the spring; and there issues from it the *foundress pseudogyne*, which forms its gall in *April*, and surrounds itself in *May* with a numerous progeny of young animals born alive.

The *whole* of this progeny acquires wings and becomes the *emigrant pseudogyne*, which flies away and settles itself upon grasses, especially upon *Triticum repens*. This emigration takes place in June.

Here this form produces living young, which pass to the roots, where they live as *gemmiparous pseudogynes*, continue wingless, and deposit in July and August living young, which are destined to acquire wings.

In fact, in September and October, this fourth form, which is the *pupiferous pseudogyne*, issues from the ground in the winged state, and returns to the trunks of the elms, where it produces sexual individuals, which copulate, after which the female goes to hide herself and die beneath the bark, retaining in her body the *single* fecundated egg, for which the dried skin of the mother forms a double envelope.

Each phase, even the sexual, undergoes four moults before becoming capable of giving origin to the succeeding phase by gemmation, or of copulating. Including the sexual forms, therefore, this insect presents twenty-four different forms (sixteen in the larval or *pseudogyne* state and eight in the sexual). These forms are in general easy to distinguish by the number of joints in the antennæ, which vary from four (in the founders) to five and even six in the winged forms.—*Comptes Rendus*, December 4, 1882, p. 1171.