

POLYGENESIS IN THE EGGS OF THE CULICIDÆ¹

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To advance such a revolutionized suggestion as is indicated by the title of this paper in the face of long established belief may be looked upon as venturesome. Although it may seem startling to the zoologist, whether I am jeopardizing my reputation or am justified in making such a broad assertion, may best be ascertained by going over the work laid down in the forthcoming papers on the facts in relation to an apparently unrecognized law in the process of evolution.

"Polygenesis or the production of more than one species from the same egg-mass will doubtless prove a proposition difficult to bring to the minds of even the most careful scientists. Appreciating that it is contrary to ancient or modern belief as to the laws of nature, the statement is nevertheless made, and will be supported by convincing facts. The several features of importance in connection with these researches are not hasty conclusions or the result of a few years of study but even extend beyond a quarter of a century amid the pleasures, trials, and adversities in a difficult but guarded labor.

"After familiarizing myself with the strange phenomena and unraveling the question in connection with it—the question of polyembryony—in some parasitic hymenopterous insects of the family *Chalcididae* I set about looking for other phenomena which would further explain Polygenesis or the production of different species from the same egg which was thought should be correlated with the process of budding from the same egg as I found it in Polyembryony. In this, fortune has been propitious to me.

PUBLISHER'S NOTE.—We must naturally leave the full responsibility of this alarming news to our esteemed co-worker, and remain skeptical towards it until the proof of this announcement is placed before everyone. Notwithstanding this, we did not deem it advisable to withhold it from our readers.—*Natur und Haus*.

¹This notice, under the title, "Polygenese bei den Eiern der Stechmücken (Culicidæ)," appeared in *Natur und Haus*, Vol. XV., No. XV., May 1, 1907, pp. 236-27. It is principally extracted from an unpublished article on "Mutation in Mosquitoes."



FIG. 1. *Culex pipiens* Linnaeus, in the act of ovadeposition, natural size. Photographed from life by S. E. Weber.

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BIOLOGY

The following phylogeny will help to convey my meaning:

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| POLYGENESIS | { | <i>Polyembryony.</i> The produc- tion of chains of individuals from one egg. | { | <i>Examples.</i> <i>CHALCIDIDÆ.</i> |
| | | <i>Mutation.</i> The production of more than one species or <i>genera</i> from the same egg deposition. | { | <i>CULICIDÆ.</i> <i>PSOCIDÆ.</i> |

“The second phenomenon in Polygenèsis is a step which bestrides a colossal question, and in the extraordinary process is found the widest bearing upon profound biological problems.”

The perplexing manifestations of the phenomena have been noted by some entomologists in the study of mosquitoes where observers have found that divers larvæ produced adults so similar that they were unable to separate them. This work will not only illuminate that puzzle in entomology but will throw a most interesting and important beam of light onto the mystery of evolution. The species upon which these observations have been directed are of the Linnæan genus *Culex*. The cosmopolitan species *Culex pipiens*, Fig. 1, is the most common mosquito of North America and figures largely in these observations. For the purpose of reviewing parts of the work in the last three years a laboratory adjoining a natural breeding place, with a capacity of 100,000 egg-masses of this species alone, was conducted where the necessary abundance of material was furnished.

The presentation of this subject should be preceded by a zoological description of the species in question, followed by a study of the egg-mass, but since such a treatment would exceed the limits of space allowed by most scientific journals, a preliminary paper now awaiting publication has been written without such a consideration,—entitled “Mutation in Mosquitoes.” Under this heading are brought facts illustrating that two or more species may be produced from the same egg-mass. And conversely that two or more species of larvæ may revert to one and the same species of adult mosquito. This same phenomenon of originization seems to dominate in the structure as well as in the color mutations.

“A zoologist asked the question—‘What was the fertilization of the egg-mass which gave rise to different species?’ Upon my reply that ‘I do not know,’ he was ready to drop the discussion. The burden of proof in this work, will be, to show the independence of the important question of fertilization regarding the mutation process in insect life. To the biologist, who has studied the varied vital powers and susceptibilities of the reproductive cell, and halted at the question

of fertilization, I may say, that these observations in the phenomena of changes proceed by that point, disregarding it as the most vital factor. It is one of many influences which may be operative in these changes. Fertilization seems to be a law of preservation rather than that of organization of species. Unless it can be shown that the intra- as well as the extra-procedure in these phenomena regarding the life history of mosquitoes are principally governed by fertilization, this influence, can not be accepted as the principal cause. This may only be proved by further study of the law which embraces both types of mutation—with, or without integrations."

The type of mutation referred to in the phenomena in question, notably the reversion of life stages, of different species which had issued from one egg-mass to the progenitor which deposited the eggs, and the coming out from one and the same egg-mass of different species by a certain internal force of nature, is not the type which constitutes a mutant in the sense in which the term is used by de Vries. The latter is based on unit characters which will not fractionize with other characteristics. Such discontinuous variants or mutants may be seen to issue from egg-masses while the other method is operative.

"Since the combination of different larval species and the folding into one adult species is a fact, the unfolding must be looked for in the stream which flows from the internal state, which must be through the egg, for we have no bud-sports or shoots in animal life. (*I. e.*, not like in plants; of course we have the embryonal budding in insects as mentioned under polyembryony.) Our only course is to accept the egg-mass as the only medium through which sports—or species assuming a different character from the parent—are suddenly produced. Hence the polygenetic power of the egg-mass in mosquitoes."

These phenomena are a new domain of investigation in the origin of species and may demand to be designated under other terms. They disclose what takes place in nature, and render the process of evolution amenable to direct observation.

Briefly.—Divers mosquito larvæ producing similar adults must spring from similar adults.

The egg-mass of the Culicida is but a part in the life cycle of the individual of a species endowed with the same inherent principles as the other stages, more particularly by the larval portion, and as such may be considered as A POLYGENETIC FACTOR."

LANCASTER, PA.,

December 1, 1906.



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This article is reprinted in the original by the author for the reason that articles on the subject have been refused publication by the editors of six American scientific journals, who should be willing to give a man a hearing after having worked out a simple truth, even if it is contrary to general belief or their own views.

When I consider my own skepticism as to the laws in mutation, how often it was necessary for me to see it occur under my eye, before being convinced that it was an actual fact, I can feel more charitable toward anyone for disbelieving, and resting in the sentiment expressed by one of the editors who did not accept an article on the subject because—"its readers might be expected to remark as did Binthem I believe—"I am very glad, my dear sir, that *you* saw that, for if I had seen it myself, I would not have believed it."

After years of personal labor on such an important question, it seems unjust to be deprived of even a hearing in one's own country.

As a matter of fact the lamented COPE in 1893 asked for an article on the subject for the *American Naturalist*, and the recent words from Professor E. G. CONKLIN—"get in print and let us study your work"—express the sentiments of others with whom the work has been discussed.

Dr. R. W. SHUFELDT says, "I, too, am skeptical as to your views, but at the same time I believe in always giving a man a fair hearing." I am much indebted to Dr. SHUFELDT for calling my attention to the avenue through which the announcement of this work at least gained record.

While American readers have been deprived of these articles through the English language, they are referred to the German publication, and the forthcoming Archives from this Laboratory.

The words from Professor HUGO DE VRIES, "I am very glad that you are convinced of my interest in Mutation in insect life," swings the pendulum laden with unction to my breast far beyond the power of expression.

I am trusting that this fair flower of truth, hampered thus far, may through the great innate power of itself, soon bloom with its pure leaves of charity, sincerity and peace, and may all the skepticism be vanquished by the noble influence of its fragrance which time alone can expand.

If Sir WILLIAM RAMSAY'S reported marvelous discovery (a few days ago) of a method of transmuting a higher into a baser metal—copper into lithium—is a fact, then he has evidently been working with the law of organization in mutation which I am familiar with in animal life. I am anxiously awaiting his own report upon his experiments. The law which reduces a higher metal into a lower must work both ways; and therefore that end of the principle in chemical discovery may sooner or later be accomplished. It may certainly be reasonable to state that the law of changes which I have discovered in animal life is common to the three kingdoms.

LANCASTER, PA.,

July 29, 1907.

The author of this paper was born in Hegins, Pa., July 20, 1861, received an academic education at Sunanewtown, Pa., and graduated from the Ontario Veterinary College in 1884. Member of the American Veterinary Medical Association, the Pennsylvania State Veterinary Medical Association, etc.

Subscriptions towards the publication and distribution of the Archives from this Laboratory may be sent to Mr. JOHN C. CARTER, Cashier of Fulton National Bank of Lancaster, Pa., who will receipt for them to subscribers.