

THE EARLIEST WINGED INSECTS OF AMERICA: A RE-EXAMINATION OF THE DEVONIAN
INSECTS OF NEW BRUNSWICK, IN THE LIGHT OF CRITICISMS AND OF NEW
STUDIES OF OTHER PALEOZOIC TYPES.

BELIEVING that science is little advanced by the acrimony engendered by controversial essays, the writer has always avoided replying to any criticisms of his scientific work, however destructive they might appear at first sight, until in the natural course of subsequent studies it became necessary to subject them to public examination. Generally much time will then have elapsed, both parties may view the matter more dispassionately and, notwithstanding the delay, the truth is likely to be sooner reached.

It is on this account that up to the present time I have in no way noticed the objections which Dr. Hagen¹ made four years since to my interpretation of the wing-structure of the Devonian insects,² although his criticisms were not always couched in the most temperate language. Now, however, that it has become necessary, for a work in hand, for me to review systematically the entire series of paleozoic insects, the Devonian wings have been studied anew, with the intention of profiting by the comments of so thorough and learned a student of Neuroptera, both recent and fossil, as Dr. Hagen is everywhere well known to be; of profiting also by the greatly extended special knowledge I have myself gained in the last five years through the kindness of many correspondents (and especially of Mr. R. D. Lacoe), who have liberally furnished me with a very considerable number of new paleozoic insect types, discovered in this country.

Without wishing to discredit in the least the worth of Dr. Hagen's general opinion in questions which affect the Neuroptera, I think it is only fair to point out dispassionately to the inquirer of the future four things. 1°. That in the historic development of the broader groups of insects, so far as we now are acquainted with them, no important changes have transpired *since* paleozoic times; while our perplexity regarding the proper relation of paleozoic insects to modern types is often very great, and our conclusions variable. 2°. That Dr. Hagen has published nothing upon paleozoic insects (apart from the paper above referred to upon Devonian insects) excepting scattered notes on a few which he referred to Termitina and which, in all probability, are no Termitina at all.³ 3°. That there is no evidence, but the contrary, that Dr. Hagen in his investigations, *uses* the "theory of descent" as a working hypothesis, without which no one who is studying any group of animals in the period of its rise and most rapid evolution can expect to do otherwise than stumble and wander astray. To refuse to use it is to merit failure. 4°. That

¹ Bull. Mus. Comp. Zool., VIII, no. 11.

² Anniv. Mem. Bost. Soc. Nat. Hist., 1880.

³ See Proc. Amer. Acad. Arts Sc., XX, 167-173.