

Dr. H. B. Geinitz, Dr. Goldenberg, Dr. Hagen, Professor Lindström, Dr. Nývák, Mr. B. N. Peach, Dr. Sterzel, and others, the author stated that at the date of his last paper (March, 1879), only 103 fossil insects from the Carboniferous rocks of the whole world were known; but that during the last five years a large number had been discovered, including about 1400 from the Coal-measures of Commeny, France; a few from Saarbrück, Klein Opitz, Lugau, and elsewhere in Germany; and a considerable number from various parts of the North American continent. Such of the specimens as had yet been determined were then enumerated, some of the most remarkable forms were referred to in detail, and attention was drawn to their affinities with existing types. According to M. Brongniart the Commeny fossils included about 40 types, some of which appeared allied to representatives of existing genera of *Hemiptera*, *Neuroptera*, *Pseudo-Neuroptera*, and *Orthoptera*. On the other hand, many of these fossils apparently belonged to some synthetic or homogeneous types, uniting in themselves characteristics of *Neuroptera* and *Orthoptera*, or *Neuroptera* and *Hemiptera*, and proving that at this early period the differentiation of most of the existing groups had hardly commenced.

Attention was then called to the discovery, last year, of fossil Scorpions in the Upper Silurian of the Isle of Gotland and Scotland, and of the wing of a Cockroach in the Middle Silurian of Jurques Calvados, France. Prior to these discoveries, no remains of terrestrial animals had been obtained from any strata older than the Devonian, and the result of their discovery in Silurian strata was to leave the Insects the oldest known class of land animals, and the Cockroaches the oldest known family of insects.

The paper concluded with a summary of the results of recent discoveries, and it was stated that the evidence afforded by Paleontology was, as far as it went, in support of the views as to the origin of insects, and the order of succession on the earth of the various groups, arrived at by Dr. Packard and others from a study of the embryology of the class. No evidence had however yet been obtained of the existence of any earlier forms connecting the Insecta with those lower groups from which they are believed to have originated.

CORRESPONDENCE.

THE ENSTATITIC LAVAS OF EYCOTT HILL.

SIR,—Mr. F. Rutley, in his letter on the "Enstatitic Lavas of Eycott Hill," is not quite correct in some of his statements. He asserts that when the late Mr. Clifton Ward wrote his Memoir on the Geology of the northern part of the Lake District, the name Andesite was not in use except as a synonym for andesine felspar. To this I demur—the rock, for instance, is described in my edition of Zirkel's *Mikroskopische Beschaffenheit*, which is dated 1873, my copy of the Memoir being dated 1876. It is even mentioned in Lawrance's translation of Cotta (1866). Further, I remember

pointing out to Mr. Ward, when first he used the term *felsidolerite* (a term of barbarous etymology and self-contradictory), that the more acid lavas of the Lake District agreed with some porphyrites, and only differed from andesites by slight mineral changes.

Again, the rhombic pyroxene which I have described in the Eycott Hill rock (which I leave among the *basalts*) differs in some respects from that described by Messrs. Cross, Iddings, and Teall, and (as may be seen from my paper) is more nearly related to the mineral which occurs in certain peridotites and serpentines. As I went in 1876 to examine a rock containing it, I presume it was pretty well known some years previously. It was, however, very natural that Mr. Ward should overlook this mineral—indeed, a characteristic specimen may not have occurred in the slide or slides which he examined. This, however, seems so obvious a truism that the only motive which I can understand in Mr. Rutley's letter is to hint obliquely that I have not done Mr. Ward full justice. This I maintain is not warranted by anything in my paper. No one can regard the memory of Mr. Clifton Ward more highly than I do, for I continue to regret him as a near and dear friend, no less than I esteemed him as a geologist. But I did not and do not consider that I was bound to preface my paper by some apologetic remarks for venturing to correct slightly and add a little to what he had written on the subject. If we, whose lives are spared, are not to endeavour in our humble way to advance knowledge, for what are we living?

T. G. BONNEY.

SUBTERRANEAN CONTOURING ON GEOLOGICAL MAPS.

SIR,—In the May Number of the GEOLOGICAL MAGAZINE, received yesterday, a Correspondent of yours asks me: "How the position for contours [of Rock Beds] may be accurately ascertained at depths far removed from observation, amongst highly contorted or disturbed strata?" Really I know of no method but digging; yet it sometimes happens even in such extreme cases that an opinion of more or less value can be formed by means of a careful instrumental survey.

What I maintain is that contour lines enable any such opinion to be expressed clearly and precisely, of course the mode of expression does not by its clearness and precision increase the certainty or truthfulness of what is expressed. Nor are opinions necessarily valueless because not certain beyond a doubt; nor are all opinions to be called mere "fancies." If geological maps could literally only give what has actually been observed on the surface, they would generally be barren indeed and leave almost as much to the intelligence of the reader as the unexplored ground does. The aim of geological surveys is to ascertain the probabilities in regard to what is hidden; and in easy cases and thorough surveys the probabilities perceived by the geologist are sometimes practically as good as certainties; in many other cases the indication with precision of the probable, not "merely possible, position" of a rock bed under cover