PYROXENE AND SERPENTINE IN ASSOCIATION WITH EOZOÖN CANADENSE.

SIR,—I fear that in my short notice of the rock containing Eozoön at Côte St. Pierre, which was printed in last year's Volume (p. 292), I must have failed in clearness of expression, since my friend Sir William Dawson, in his interesting defence of "the animal nature of Eozoön," says (p. 505) there "seems to be no good evidence that any portion of the pyroxene has been changed into serpentine." But of that, as I endeavoured to intimate on parts of pages 297 and 298, I have as good evidence as is possible. My slices show every stage from an unaltered pyroxene (allied to malacolite) to serpentine. In one slice, where the "canal-system" is well preserved, a few residual bits of pyroxene remain among the serpentine; in all the close resemblance of the silicates indicates an identity of the origin, which can be proved in the case of some. His suggestion that the pyroxene may have originated from local showers of volcanic dust seems to me not very probable. Grains or crystals of pyroxene are, no doubt, ejected in fair abundance from certain volcanoes, but in company with basaltic scoriæ. It is difficult to understand how the latter could be sifted from the former, and if this has not been done, what has become of the abundant aluminous silicate? True, there is a little white mica in the crystalline limestone, but not enough to represent the ash even of a Limburgite. Moreover, I believe the augite of a basalt is generally the aluminous variety. Perhaps, however, he would appeal to an eruptive peridotite. Here almost all the material would ultimately produce serpentine; but, then, volcanoes discharging only olivine augite slag are extremely rare; indeed, I should hardly like to say as yet, notwithstanding Kimberley, that their existence has been proved.

T. G. BONNEY.

SWEDISH GRAPTOLITES.

SIR,—The November Number of the GEOLOGICAL MAGAZINE contains the conclusion of an English translation of Dr. G. Holm's paper "On *Didymograptus*, *Tetragraptus*, and *Phyllograptus*," upon which I trust you will allow me to make the following remarks:—

Speaking of *Isograptus gibberulus*, Nich., sp. (or, as he prefers to term it, *Didymograptus gibberulus*), Dr. Holm quotes a previous paper of mine, in which I have treated of this matter. In that paper I stated in the very beginning, in direct terms, that the fossil in question has two stipes. Further on a sicular appendage is mentioned which, at a long distance from the sicula, is not inconsiderably widening.

Now we have to remark that Hall (in his "Graptolites of the Quebec Group") has figured some specimens of *Tetragraptus Bigsbyi*, Hall, so placed on the slab that two stipes are wholly visible, while you can only see the profile of a third. Such a stipe affords some very remote resemblance to the appendage described, and in order to avoid the suspicion that my observations had been based upon specimens preserved in a similar manner, I have appended in a footnote this remark: "Since this dilatation (of the

sicular appendage) never takes place except much outside the surrounding stipes, it is almost impossible to make the mistake of considering the appendage as part of a third branch." This statement was singularly misinterpreted by Dr. Holm in his paper "On *Didymograptus*, etc." But, as I thought I had expressed myself pretty clearly, and did not fear that any other Swedish reader might misunderstand the meaning, after having privately pointed out his error to Dr. Holm, I did not think it called for any public reply. I was therefore not a little astonished at finding that in the English version my statement was still further misrepresented. The English reader must be convinced that my assertions on two consecutive pages are contradictory. But my statement in the before-mentioned footnote is, as everyone can see, in full accordance with the views presented on the preceding pages, and totally contrary to the version given by Dr. Holm.

Hoping shortly to find time for working out a description of an interesting Graptolite-type, which I have met with, I will for the present refrain from making any further remarks about the genus *Isograptus*, which, I believe, should still be maintained.

LUND, 8*th December*, 1895. JOH. CHR. MOBERG.

MISCELLANEOUS.

FURTHER NOTES ON EOZOÖN CANADENSE BY SIR WM. DAWSON, C.M.G.

NOTE TO SECOND ARTICLE.—I should have mentioned in this article that Dr. F. D. Adams has shown, by comparison of a number of detailed analyses, that several of the gneisses of the Grenville Series have the chemical composition of Palæozoic slates, and thus that there can be no chemical objection to regarding them as altered sediments. This I consider a very important observation; and I may refer for details to his paper in the American Journal of Science, July 1895, vol. L, p. 58.

NOTE TO THIRD ARTICLE.—The tubes penetrating some of the larger specimens of Eozoön may perhaps be compared with the central canal in the modern *Carpenteria*.—W.D.

SECTIONS OF BUNTER AND KEUPER, ETC.

DURING the construction of the Seacombe branch of the Wirral Railway the strata have been examined by Mr. T. W. Davies and Mr. T. Mellard Reade. Sections of Bunter, Keuper, and Glacial Drift are described by them. They note evidences of denudation of the Bunter prior to the accumulation of the Keuper. The Glacial Drift was found to comprise two beds of Boulder-clay separated in places by sand. In the Lower Clay abundant Foraminifera were discovered, while but few occurred in the Upper Clay. (*Proc. Liverpool Geol. Soc.*, vol. vii, part 3.)

MR. R. BULLEN NEWTON is continuing his useful work on the Eocene Mollusca, and has described a number of Gasteropods which have hitherto received only MS. names. (*Proc. Malacological Soc.*, vol. i, part 7.)