rock of a different character. It was always accompanied by more or less native gold.

Mr. PATTISON remarked that in many places where tin occurred it was not present in sufficient quantity to be remuneratively worked.

Mr. D. FORBES, in answer to a question from Prof. Ramsay, stated that, as far as could be ascertained, the age of the stanniferous granites mentioned by him must be between the end of the Silurian and the early part of the Carboniferous period.

Prof. RAMSAY would carry them down to the close of the Carboniferous period, and would be contented to term them pre-Permian.

2. REMARKS *on the* GREENLAND METEORITES.

By Professor A. E. NORDENSKIÖLD, For. Cor. G.S.

THE meteorites which I discovered at Ofivak, in Greenland, in 1870, most of which have now been brought home by the expedition of this year under the command of Baron v. Otter, seem to have formed the principal masses of an enormous meteoric fall, which took place during the Miocene period, extending over an immense area (some 200 English miles) not only of the region occupied by the Greenland basalt, but also where the country is composed of granite-gneiss.

The native iron is very variable in appearace; but as far as I yet can judge, it is free from silicates, notwithstanding that pieces of basalt (apparently?) are imbedded in the exterior of the blocks, apparently filling cavities in the outer surface of the original meteorites.

The basalt at a distance from this locality does not contain any native iron; it is only in the immediate vicinity of the iron masses themselves that native iron along with pebbles is found in the basalt, which at this place is clearly seen to be a subsequently consolidated basalt-tuff and not congealed lava.

That this iron is of eruptive origin appears impossible to me, because:—(1) the iron, upon being heated, evolves gaseous matter even up to as much as 100 times the volume of the iron itself; (2) it contains distinct isolated particles of sulphide of iron, which are imbedded in the rest of the mass of iron, which in itself is free or nearly free from sulphur; (3) the external form of the iron masses themselves does not show evidences of their having been poured out, when in the molten condition, into a cavity or fissure.

The character of the iron masses is extremely variable, as they are in part composed of meteoric nickeliferous cast iron, or of meteoric nickeliferous wrought iron, or mixtures of both; in which last case the so-called Widmannstætten's figures are found to be best developed.

The native iron found in the basalt occurs:—

A. As enclosed and but little altered meteoric stones.

B. Filling up cracks from one to two lines in width, and being either fragments of meteorites flattened out under the influence of time, or wedged into these cracks in the act of falling, or which have fallen into cracks in the subsequently consolidated tuff.

C. Brecciiform stones composed of fragments of the iron cemented together with hydrated oxide of iron and newly formed silicate of iron.

D. Close to the iron masses which occur in the basalt are also found enclosed fragments of a rock unlike the basalt itself, and remarkable for being rounded on the edges and having what resembles a meteoric crust on the exterior! I do not venture to express any decided opinion as to the origin of this variety.

E. As grains disseminated in the basalt, occasionally as large as peas or beans, but oftener only as fine scales, which, in my opinion, have in part been disseminated through the basaltic ash which was the material from which the present basalt was formed, and in part produced through pseudomorphic processes due to the presence of the large iron masses themselves, and which it is without doubt easier to explain than to account for the tin-ore (cassiterite) pseudomorphs of orthoclase found in Cornwall.

The great mass of the Greenland basalt is without doubt only consolidated beds of basaltic ashes.

Within an area of at most 50 square metres 15 meteorites were found, which weighed as follows in Swedish pounds:—50,000, 20,000, 9000, 336, 230, 200, 191, 150, 150, 100, 56, 42, 15, 8, and 6, the three largest being in their diameter respctively 2 by 1·7 metres, 1·3 by 1·27 metre, and 1·15 by 0·85 metre. About 100 lbs. of lenticular-shaped fragments of iron, from 3 to 4 inches thick, were also extracted from the basalt dyke close at hand.

The following analyses show the chemical composition of the iron:—

	Part of one of the largest blocks, A. E. Nordenskiöld.	Of a lesser block, Th. Nordstrom.	Of iron from the basalt, G. Lindstrom.
Iron	84·49	86·34	93·24
Nickel	2·48	1·64	1·24
Cobalt	0·07	0·35	0·56
Copper	0·27	0·19	0·19
Alumina	trace	0·24	....
Lime	trace	0·48	....
Magnesia	0·04	0·29	trace
Potash	trace	0·07	0·08
Soda	trace	0·14	0·12
Phosphorus	0·20	0·07	0·03
Sulphur	1·52	0·22	1·21
Chlorine	0·72	1·16	0·16
Silica	trace	0·66	0·59
Insoluble	0·05	4·37	
Carbonic organic matter water (and loss)	10·16	3·71	C 2·30 H 0·07
	100·00	99·93	99·79
Sp. gravity	6·36 & 5·86	7·05 & 7·06	6·24

Analysis of the insoluble silicate by Nordstrom :—

	From the largest blocks.		Of rock attached to the outside of largest block.
Silica	61·79	....	44·01
Alumina	23·31	....	14·27
Sesquioxide of Iron ..	1·45	....	3·89
Protoxide of Iron	....	....	14·75
Magnesia	2·83	....	8·11
Lime	8·33	....	10·91
Potash	2·29	....	0·97
Soda			2·61
	100·00		99·52

Discussion.

Mr. Roberts protested against the evolution of gaseous matter being considered a proof of meteoric origin.

Prof. Ramsay reiterated his previously expressed opinion, that the masses of iron might be of telluric origin.

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3. *Further Remarks on the* Relationship *of the* Xiphosura *to the* Eurypterida *and to the* Trilobita *and* Arachnida. By Henry Woodward, Esq., F.G.S., F.Z.S.

I had, on a former occasion (November 21, 1866), the honour to communicate a paper to this Society "On some points in the structure of the Xiphosura having reference to their relationship with the Eurypterida"*, in which were discussed the grounds for the union of these two suborders (afterwards dealt with in greater detail in the monograph of the Merostomata in the Palæontographical Society's publications for 1866). I therefore venture to think it may not be considered inappropriate if I bring the subject again under your consideration after an interval of five years, during which time some considerable additions have been made to our knowledge of this group.

The papers to which I shall have occasion especially to refer are the following:—

1. "On a New Limuloid Crustacean (*Neolimulus falcatus*) from the Upper Silurian of Lesmahagow, Lanarkshire." By H. Woodward. (Geol. Mag. 1868, vol. v. pl. i. fig. 1, p. 1.)

2. "On some new Species of Crustacea from the Upper Silurian Rocks of Lanarkshire, and further Observations on the Structure of *Pterygotus*." By H. Woodward. (Quart. Journ. Geol. Soc. 1868, vol. xxiv. pls. ix. & x., p. 289.)

3. "Notes on some Specimens of Lower Silurian Trilobites." By E. Billings, F.G.S. (Quart. Journ. Geol. Soc. 1870, vol. xxvi. pls. xxi. & xxii., p. 479.)

4. "Note on the Palpus and other Appendages of *Asaphus* from

* Quart. Journ. Geol. Soc. 1867, vol. xxiii. p. 28.