humerus presented by Miss Gurney to the Norwich Museum from the Elephant-bed at Bacton. This Mundesley specimen is calculated by Dr. Falconer to have belonged to an animal that stood 17 feet, measured from the foot to the dorsal-vertebral spine. It is remarkable that the three several specimens, the ramus, the humerus and the os inomenatum, agreeing together in point of form, should have been derived from the same bed. What is still more extraordinary, there are in Mr. Randall Johnson's grand collection, two bones, a femur and a radius, taken from precisely the same spot, which exhibit the like peculiarity of structure, namely, excess of dimensions in comparison with substance.

Of the femur Professor A. Leith Adams writes, Pal. Soc. Mon. 'Fossil Elephants,' part iv. p. 222: "As compared with any femur at all referable to European extinct elephants, the specimen in the possession of Mr. Randall Johnson, late of Palling, far outstrips the largest in dimensions. It was discovered at Mundesley in the Forest-bed in conjunction with the humerus No. 200 of the Gunn collection (pl. xvi. fig. 2) and the huge radius also referred to page 217. Conjointly they represent a stupendous Elephant only second to the Dinotherium in size."

Thus it appears that these five specimens, which were found in the same bed, near the same place, remarkably correspond; so much so that it was the conviction of Mr. Johnson that they not only belonged to the same species of Elephant, but to the same individual. In this I should concur, if I had not found more than the component parts of one such Elephant. However, I look forward with pleasure to the time when Mr. Johnson's collection will, as he has promised, be placed in the Norwich Museum, and then his Elephantine bones will be laid by the side of mine, making together one unrivalled individual.

I trust I have said enough to prove that no more than a type of *E. primigenius* is to be seen in the several collections mentioned, of the preglacial period; and that intermediate forms of the Elephant do intervene between the species recognized by Dr. Falconer and others.

NOTICES OF MEMOIRS.

I.—Diamond Mining at Kimberley, South Africa.

FROM the Report of "The Central Diamond-mining Company (Kimberley Mine)," made at the third annual meeting, on the 28th May, 1883, at Kimberley, South Africa, we learn that the diamantiferous rock, known as "the blue," has been pierced for "about 530 feet at the south side of the mine," without any sign of its being penetrated, and with "eminently satisfactory" results as far as the Company is concerned. It is also stated that "about 250 feet down the walls of the reef[1] consisted of igneous rock," which

[1] The term "reef" is applied to any of the rocks, stratified or otherwise, bounding or interfering with the diamond-bearing magnesian breccia, which is called "the Yellow" at the top and "the Blue" below some 50 or 60 feet depth.

"was not vertical," but "coming in more or less" (whatever that may mean), and hence supposed to be safe from falling in.

From the "Summary of Transactions" of the Company, for the year ending 30th April, 1883, we gather the following interesting particulars:—

The quantity of diamond-bearing rock termed "the blue" that has been removed ("hauled")	344,205¼	loads
The quantity of "blue" that has been washed...	314,385¼	,,
The "balance" ("blue" not used?)...	49,560	,,
The quantity of diamonds found...	471,488	carats
,, ,, sold	434,890	,,

Realized by the sale	£482,314	11	9
Cost (or value) of "plant" (Machinery, etc.) ...	£ 98,871	15	0
General expenses of working	£253,920	15	11

The quantity of "reef" (the bounding rock) hauled	285,468⅛	loads
The quantity of water used	13,283,838	gallons

Amount received from the Kimberley Mining Board	£ 55,351	12	3
The Dividend declared	£100,951	0	0
Rates and Licenses paid	£147,709	4	3

—From the "Diamond-fields Advertiser," Kimberley, June, 1, 1883.

Diamond Fields, South Africa.

The De-Beer's Mining Company, in their Report of the Annual Meeting held on the 7th May, 1883, state that during the year ending 31st March, 1882, 96,439 loads (16 cubic feet) of "ground" washed yielded 76,859 carats of diamond, realizing £104,552 8*s.* 8*d.*; whilst during the year ending March 31, 1883, 166,136 loads washed yielded 149,396 carats, realizing £158,675 4*s.* 3½*d.* (£161,675 4*s.* 3*d.* according to one of the Tables), giving an average yield of 19*s.* 1¼*d.* a load, at a cost of 11*s.* 9¼*d.* a load, leaving a profit of 7*s.* 3¾*d.* a load. Average per carat 21*s.* 3*d.*

"Blue ground" already on the "floors" to March, 1882	3,000	loads	
,, hauled and deposited on the floors to March 31, 1883	179,785	,,	
,, washed from March 1882 to April 1883, estimated at	166,136	,,	
,, left on the "floors"	16,649	,,	
,, "Floating reef" hauled	130,370	,,	

Besides this balance of "blue ground" the Company has 25,000 loads of "lumps" spread out on its "floors," representing a cost of £1250, and producing an average of ⅔ths of a carat a load, showing the "ground," after allowing a per-centage for "black reef" and "high ground," has averaged for the year at least a carat a load.

II.—Palæozoic Phyllopoda; As Reported on to the British Association, Southport, 1883, Section *C.* Geology.

PROF. T. RUPERT JONES, having especially devoted himself, in the past year, to a study of the fossil *Phyllopodous Crustacea*, finds that there are upwards of thirty recognized genera, of which seventeen occur in Britain.

After carefully collating original sketches and the tracings of all published figures, the following synopsis of the genera has been drawn up by him as a basis for a more complete study of this extensive group.

Geological Stage.	Genera.	Special character.	No. of exposed abdominal segments.	No. of caudal spines. Styliform styles of the telson.
		I. Carapace Univalve.		
		(I.) Flat Shield.		
		1. *Neither sutured nor ridged along the back.*		
		(A). Posterior border entire. (Far behind.)		
Silurian	*Discinocaris*, H. W., 1866	Angular notch*	4 ?	3 ?
? = Raibl beds (Trias, Hallstadt)	*Aspidocaris*, Reuss., 1867.....	Angular notch* * Round shield.		
Devonian.....	*Spathocaris*, Clarke, 1882.....	Angular notch.†		
Devonian.....	*Pholodocaris*, H. W., 1882	Sinuous notch.†		
Devonian.....	*Lisgocaris*, Clarke, 1882	Oblong notch.†		
Devonian.....	*Ellipsocaris*, H. W., 1882.....	Rounded notch.† †These shields differ in shape.		
		(B.) Posterior border slightly notched.		
Devonian.....	*Cardiocaris*, H. W., 1882.....	Front notch oblong.		
		(C.) Posterior border deeply notched. (Open behind.)		
Silurian	? *Pterocaris*, Barrande, 1882.....	Both notches angular (test radiately marked).		
Lower Silurian and Devonian	*Dipterocaris*, Clarke, 1883	Both notches angular.		
		2. *Ridged along the back.* (*Like Apus.*)		
Carbonif. & Devonian ? = Carboniferous	*Dithyrocaris*, Scouler, 1843 ..... (*Argas*, Scouler, 1835)	Ridged and sometimes prickled.	1, 4, or 6	3
	Rachura, Scudder, 1878	(Telson only known.)	—	3
		3. *Sutured along the back.*		
Silurian	A. *Aptychopsis*, Barrande (and H. W.), 1872.....	Angular notch.		
Lower Silurian	B. *Peltocaris*, Salter, 1863	Rounded notch.....	4 ?	4 ?
Lower Silurian	C. *Pinnocaris*, R. E., jun., 1878	Slight notch : striæ concentric far back.		
Silurian	D.? *Crescentilla*, Barr., 1872	Notched before and behind.		

Geological Stage.	Genera.	Special character.	No. of exposed abdominal segments.	No. of caudal spines, Styles and stylets of the telson.
(II.) Folded Shield, bent along the back (like *Nebalia*), so as to form two side-flaps or attached valves.				
Lingula-flags. 1.	*Hymenocaris*, Salter, 1853	Smooth	8 or 9	6
Silurian. 2.	*Dictyocaris*, Salter, 1860	Reticulate	6 ?	3 ?
Silurian. 3. ?	(*'Cytheropsis testis,'*) Barr., 1872			
Uppermost Devonian or Lowest Carboniferous. 4.	? *Protacaris*, Baily, 1872	(Not well known.)		
II. Carapace, Bivalve; Valves Hinged. (I.) Pod-like.				
Arenig and Lingula-flags.	1. *Caryocaris*, Salter, 1862	Pod-like, smooth	—	3?
Tremadoc, Silurian, and Devonian (America)	2. *Ceratiocaris*, M'Coy, 1849	Subovate, suboblong, etc.	5, 6, or 7	3
Silurian.	3. *Physocaris*, Salter, 1860	Round	5 or 6?	
Carboniferous.	4. *Colpocaris*, Meek, 1872	Subovate, strongly emarginate at one end (posterior).	—	3
Devonian.	5. *Echinocaris*, Whitfield, 1880	Leperditioid.	4 (spiny)	3
Silurian.	6. *Aristozoe*, Barrande, 1868	Leperditioid.		
Silurian.	7. *Orozoe*, Barr., 1872	Leperditioid.		
Silurian.	8. *Callizoe*, Barr., 1868	Leperditioid.		
(II.) Conchiferoidal; probably enclosing all the abdominal segments.				
Tremadoc.	1. *Lingulocaris*, Salter, 1866	Modioloid, and faintly ridged.		
Carboniferous.	2. *Solenocaris*, Meek, 1872	Long, and concentrically marked.		
Lower Silurian.	3. *Solenocaris*, Young, 1869	Oblong, and obliquely ridged, and concentrically marked.		
Silurian or Devonian ?	4. *Myocaris*, Salter, 1864	Quadrangular, and strongly ridged obliquely.		
Carboniferous.	5. *Leaia*, Jones, 1862	Quadrangular, and strongly ribbed obliquely, and concentrically marked.		
Silurian ? Devonian. Carboniferous. Triassic. Rhætic. Jurassic. Neocomian Tertiary ? Recent.	6. *Estheria*, Rüppel, 1838	Like a bivalved mollusc, and concentrically marked.		

During the study of *Hymenocaris* it was found that "*H.*? *major*," Salter, comprises a *Ceratiocaris* possibly matching the Tremadoc specimens assigned to the genus by Mr. Salter; and it has therefore been put under the most authentic (*C. insperatus*) of the two Tremadoc species noticed by him.

The Australian *Hymenocaris Salteri*, M'Coy, having been assigned by Mr. Salter to *Caryocaris*, when he was studying that group in 1862, it has been regarded as a member of the latter genus.

With *Caryocaris Marrii*, Hicks, is a specimen associated under the same name in the Woodwardian Museum, that proves to be an *Entomidella;* as it differs somewhat from the known species of that genus, it is now named *E. Marrii.* Of the other specimens named *C. Marrii*, some do not differ from *C. Wrightii*, Salter; but one retains the specific name given by Dr. Hicks.

Besides the *Lingulocaris lingulæcomes*, Salter, some casts in the British Museum seem to warrant the adoption of a new name, *L. siliquiformis*, for a different but allied form.

III.—Examination of the Meteorite which fell on the 16th February, 1883, at Alfianello, in the District of Verolannova, in the Province of Brescia, Italy. By Walter Flight, D.Sc., F.G.S.[1]

I GATHER from a short preliminary notice, which has been sent by M. Denza to Professor Daubrée, and has been published in a recent number of the "Comptes Rendus," a few particulars respecting the fall of this stone, and its general appearance.

The fall took place, with a loud detonation, at 2·55 p.m. on the day above mentioned; it was heard in the neighbouring provinces of Cremona, Verona, Mantua, Piacenza, and Parma. In Alfianello it is described as "épouvantable."

It descended from N.N.E. to S.S.W. at a distance of about 150 mètres from a peasant, who fell fainting to the ground; telegraphic wires were set in motion, and the windows were shaken. It struck the ground about 300 mètres south-west of Alfianello, in a field on an estate called Frosera, penetrating the soil, in the same direction as it passed through the air, from east to west, to a depth of about 1 mètre, the path through the soil being about 1·50 mètre. When taken out of the ground, it was still a little warm. It fell complete, but was at once broken to pieces by the farmer of the estate.

The stone is oval in form, and somewhat flattened in the centre, the lower part being larger and convex, like a kettle, the upper part being truncated. The surface is covered with the usual black crust, and strewn with little cavities, now met with as individuals, now in groups, and in the eyes of some people bearing a resemblance to the impression of a hand or the foot of a she-goat. The stone weighs about 200 kilos.

In structure this meteorite belongs to the group Sporadosideres oligosideres, and resembles *Aumalite*, being almost identical with the meteorite of New Concord, Ohio.

[1] From the Proceedings of the Royal Society, No. 226, 1883.

The substance is finely granular, of ash-grey colour; a polished surface appears to be finely grained and breccia-form, with the elements offering different gradations of colour. Metallic grains are disseminated, and little nests are noticed, of iron with one of the compounds, of a yellowish-white or bronze. In one place where the metallic grains are numerous they appear to bear to the stony portion the ratio 68 : 1000. The density of the stone is 3·47 to 3·50.

The meteorite was dried at 120°, and treated with solution of mercury chloride, and thus there were dissolved the troilite and nickel-iron. The troilite constituted 6·919 per cent. of the meteorite, and the nickel-iron forms 2·108 of the stone, with the composition—

Nickel	71·205
Iron	28·795
	100·000

Here, again, as I have shown in earlier analyses, the percentage of nickel present in nickel-iron increases as the percentage of nickel-iron becomes less.

By long treatment with hydrogen chloride the silicates acted upon by that reagent and the silicates which resist the action were separated, and the stone appeared to possess the composition—

Troilite	6·919
Nickel-iron	2·108
Soluble silicate	50·857
Insoluble silicate	40·116
	100·000

The soluble silicate, which amounts to 50·857 per cent., and constitutes one-half the weight of the stone, consists of—

Silicic acid	35·12		18·73	
Iron protoxide	51·43		11·43	
Alumina	1·518		0·707	16·37
Lime	4·644		1·327	
Magnesia	7·269		2·904	
	99·98			

This olivine, which gives a green colour to a fragment of the rock that is at once recognized, is of unusual composition, containing as it does more than 50 per cent. of iron oxide. It agrees most closely with that which occurs in the meteorite of Ensisheim, the first recorded fall which has been preserved in any collection; it fell 17th November, 1492. The latest analysis of that stone is by Frank Crook, of Baltimore, made in Gottingen in 1868, and he found in the soluble portion of that stone 52·90 per cent. of iron oxide.

The insoluble portion, which forms 40·116 per cent. of the stone, has the composition—

Silicic acid	56·121		29·93	
Iron protoxide	13·397		2·97	
Chromium oxide	8·281		...	11·05
Lime	6·712		1·917	
Magnesia	17·263		7·065	
	102·174			

The bronzite, or rather augite, also agrees very well with that which forms the insoluble portion of the meteorite of Ensisheim. What was supposed to be alumina was further examined, and was found to be almost entirely chromium oxide, doubtless present in combination with some iron protoxide, alumina, and magnesia as chromite. And it appears not improbable that this part of the meteorite contains some tridymite, a few per cent., in fact.

IV.—Professor Gosselet.—Geological Sketch of the North of France.—Esquisse Géologique du Nord de la France. 3e Fascicule, Terrains Tertiaires. Texte et Planches par Prof. M. J. Gosselet. (Lille, 1883.)

WITH this Fasciculus the Tertiary series is commenced, and comprises descriptions of the Eocene, Oligocene and Néogène strata of the North of France and adjacent districts. After noticing the period of emersion between the deposition of the Chalk and that of the Tertiary strata, and the deposits referable to that age, the author describes the Lower Eocene, which comprehends the Montien, Landenien, Yprésien; these are principally marine, with the exception of an estuarine fauna, which often intercalates the last two mentioned and may be contemporaneous with one or the other, and some very localized lacustrine beds containing *Physa*. The subdivisions and the variation in the lithological and fossil characters of the different localities are successively given. The succeeding Parisien, of which the beds at Cassel and Brussels represent the two principal types, is divided into five zones, characterized by (1) *Rostellaria ampla;* (2) *Nummulites lævigata;* (3) *Ditrupa strangulata;* (4) *Num. variolaria;* (5) *Pecten corneus;* their equivalents in other parts of France, in Belgium and England are pointed out. The Oligocene comprises the Tongrien and Rupelien, which are also divided into zones characterized by certain fossils. The Néogène is divided into Messinien (= Bolderien and Anversien of the Belgian geologists), Plaisancien (=Diestien) and Astien (=Scaldisien), their lithological, and fossil facies, and distribution being fully noticed.

Besides numerous references to previous works relating to the different geological divisions treated of in this part, there are five plates of Tertiary fossils, many sections, an orographic map at the beginning of the Tertiary period, and also four maps indicating the continental, estuarine and oceanic areas during the Landenien, Yprésien, Parisien and Diestien epochs. To the student of British Eocene and Oligocene strata, this contribution of Prof. Gosselet on the homotaxial (if not synchronous) deposits of the North of France will be highly instructive and useful, as representing the physical features, and associated faunas of that part of the area at the Lower Tertiary period.

The fourth and last fasciculus will appear in 1884, and will contain descriptions of the recent and diluvial strata, the physical movements since the secondary period, and the orography and geography of the region as deduced from its geological constitution.

J. M.