sideration have the same thickness of the calcareous tube. The former occurs only at Speeton and the latter at Hunstanton; in order to distinguish the two, the title "irregularis" may be applied to the latter as a variety.

Serpula triserrata, a species found on a specimen of Ammonites complanatus, is distinguishable by its three serrate longitudinal ridges. A similar form occurs on ostreæ from the Kimmeridge clay of West Norfolk.

Terebratula semiglobosa is common at Speeton, but very rare at Hunstanton. T. biplicata is very common at Hunstanton, but is not known at Speeton.

Inoceramus læviusculus, Bean, a large smooth species something like I. Cuvieri.

The Ammonites alternatus of Woodward is now lost; it was probably a variety of A. serratus, Park.

Belemnites minimus is sometimes two inches long in the Hunstanton Cliff.

The vertebra of Polyptychodon would be, if perfect, about six inches in diameter and three in thickness.

The small specimen figured in Geologists' Association Proceedings, Plate II. fig. 9, evidently belongs to the Turbinolian family of corals, and possibly to the genus Trochocyathus instituted by Messrs. Milne-Edwards and J. Haime, in 1848. The specimens as yet obtained are not sufficiently numerous nor perfect for a rigid comparison with other forms, or to admit of a sufficiently detailed description should the species prove to be new. The constricted form of growth is very common in the Parasmilia of the Upper Chalk, and has no specific value.

The characteristic fossils of the Red Chalk at Speeton are Terebratula semiglobosa, Belemnites minimus, and Vermicularia elongata; and at Hunstanton, Terebratula biplicata, Belemnites minimus, and Spongia paradoxica.

FOREIGN CORRESPONDENCE.

Notices of the Meteorite of Tulbagh and of the Tertiaries of Horn. Read before the Imperial Academy of Sciences, Vienna, 7th March, 1859. Communicated by COUNT MARSCHALL.

1.—*Meteoric Stones.*

THE meteorite which fell, Oct. 13, 1838, near Tulbagh, Cold Bokkeveld (Cape of Good Hope), already analyzed by Prof. Faraday, has been submitted to a new investigation by Mr. Harris, in Prof. Wöhler's laboratory at Göttingen. This meteorite, in its black, opaque, and soft substance, greatly resembles that of Kaba (Hungary).

The analysis discovered in it 1.67 per cent. of carbon, and 0.25 per cent. of the same bituminous substance as was met with in the Kaba meteorite, a substance declared by Prof. Wöhler to be of undoubtedly *organic* origin. The inorganic constituents found in this meteorite are, iron, 2.50; nickel, 1.30; sulphur, 3.38; silica, 30.80; oxydulated iron, 29.94; magnesia, 22.20; lime, 1.70; alumina, 2.05; oxide of chrome, 0.76; potash and soda, 1.23; oxide of manganese, 0.97; copper, 0.03; vestiges of cobalt and phosphorus, deficit, 1.22

per cent., a composition greatly analogous to that of the Kaba stone. According to Prof. Wöhler's views the *mineralogical* composition of the Tulbagh meteorite may be expressed by the formula: ferrugineo-magnesian olivine, 84.32; indecomposable silicate, 5.46; sulphuret of iron and nickel, 6.94; chromate of iron, 1.11; carbon, 1.67; organic bituminous substance, and traces of copper, cobalt, and phosphorus. The first small specimens of the Tulbagh meteorite came into the possession of the Vienna Imperial Museum through M. de Struve, then resident Minister of Russia at Hamburgh; subsequently a fragment of 12½ ounces was purchased from Dr. Krauss; and Sir John Herschel himself presented the Museum with a specimen of 6½ ounces from the fragments sent to him by Mr. Maclear, the first scientific observer of the phenomenon.

The total bulk of the meteorite, partly shattered by its having fallen on stony ground, has been estimated to exceed five cubic feet.

2.—*Tertiaries of Horn (Lower Austria).*

These tertiaries, reposing on the crystalline rock-masses of the Manhartsberg, have attracted Dr. Rolle's attention on account of their fossil remains, which partly indicate an age earlier than that generally of the Vienna basin. They include, comparatively to the other Vienna strata, a greater number of gasteropods, indicative of the inferior tertiaries, with a smaller proportion of recent forms; so that they may justly be considered the most ancient of the Vienna basin, those of Grund following immediately above them, and the ascending series of marine deposits being closed by those near Baden, Vös, Pau, &c. Dr. Rolle's observations afford a new proof of the non-existence of any strictly determinable limit between the faunæ of the neogene (upper miocene and pliocene) and of the oligocene and upper eocene deposits, overlying immediately the first, several organic forms being common to both divisions, in the same way as neogene species have continued to exist amid those of the present creation.

By Dr. T. L. Phipson, of Paris.

Discovery of Selenium and Tellurium at Vesuvius — New Minerals observed by MM. Napoli and Palmieri—Metamorphism undergone by Eruptive Rocks—A few Facts connected with the Physical Geography of the Hautes-Alpes.

One of the most interesting discoveries that have been made for some time past in mineralogy is the following, which we owe to M. Raphael Napoli, professor of chemistry at Naples:—On examining the lava which has been emitted almost constantly by Vesuvius for the last

twelve months or more, M. Napoli found that it contained a considerable proportion of selenium and tellurium, combined with titanium, iron, and lead.

As the lava cools, the sulphurous acid vapours, which are exhaled in abundance from it, partially destroy these combinations of selenium and tellurium, producing a great quantity of pure selenium, which is deposited, and oxides of selenium and tellurium, which are disengaged and emitted into the air in a gaseous state and in large proportions.

Pure Selenium is thus deposited in the cavities and crevices of the lava, and in the interior of the solidified mass. No one had ever remarked this before. Doubtless Selenium has often been seen in the fissures of lava, but from its red colour it has evidently been as often mistaken for oxide of iron.

To chemists and mineralogists this discovery is of the highest interest. Both tellurium and selenium are such rare substances that they are only known as curiosities of the laboratory; and few laboratories indeed possess specimens of either.

Up to the present time, tellurium has been found, but very rarely, combined with gold, silver, lead, and bismuth, in the mines of Transylvania. In appearance it resembles antimony. It was discovered, in 1782, by Müller, of Reichenstein, and its principal properties were made known by the then eminent chemist Klaproth.

Selenium, which bears much analogy to sulphur, was discovered, in 1817, by the celebrated Berzelius. It has hitherto been found only as seleniuret of lead, a rare mineral, or combined in certain varieties of iron-pyrites. A native seleniuret of copper was discovered some years ago, and called Berzeline, in honour of the great chemist whom we have just named. Before the interesting observations of M. Napoli, selenium had never been found in nature otherwise than in combination with substances. M. Napoli has also described a new substance, which appears to be a combination of lead and selenium, discovered by M. Palmieri, the distinguished meteorologist of Vesuvius, in certain *fumarolle*, and which has been named Sacchite, in honour of Professor Sacchi, of Naples. A peculiar white substance has likewise been observed. This substance exists in the crevices of the lava, whence it is easily volatilised, mixes itself with the air, absorbs moisture, and falls again, forming a sort of crust on the surface of the beds of lava. It appears to be another combination of selenium, not yet thoroughly known. We shall return again to these new minerals when we have seen M. Napoli's memoir; we may already affirm that a new mine of interesting mineral and chemical products is open at Vesuvius, and promises fairly to be a rich one.

We now resume M. Delesse's researches on metamorphism. In THE GEOLOGIST for May last we terminated our sketch of the effects produced upon the different stratified deposits by the upheaval of igneous or plutonic rocks. We will now inquire how the igneous or eruptive rock itself is modified while acting upon the strata it has uplifted.

The metamorphism of the eruptive rock (whatever be its nature) is generally less characteristic than that of the strata uplifted. M. Delesse thinks this is easy to account for, as the latter were solid at the time the phenomenon took place, and consequently not in a condition to exercise a reaction upon the plutonic rock. This is, however, an insufficient reason, and M. Delesse's own observations show that even where no change or metamorphism is apparent in the uplifting rock, a few simple tests will enable us to affirm that a change has really taken place. When the plutonic rock is examined comparatively (in a large vein, for instance) at its borders and at its centre, it is remarked to have undergone a modification, not only in its structure, but also in its composition. Such modifications do not, however, extend more than a few inches from the borders; they are more marked in smaller veins, and more visible in lava and traps than in granite rocks.

Near the borders of a vein of rock its structure has become schistose, prismatic, granular, amygdaloïdal, &c., according to circumstances. The density of the rock has diminished in these parts, and this is very notable in the case of trap-rocks. The quantity of water which it contains has, on the contrary, augmented.* In some cases structure alone has been modified; but in most the composition of the rock is changed also. Sometimes this composition is exactly intermediate between that of the uplifting and that of the upheaved rock.

Among the minerals found in the eruptive rock near the parts in contact with the uplifted strata, M. Delesse indicates carbonates and quartz; also, different silicates, principally garnet, idocrase, and epidote. But when the reaction that has taken place between the two rocks has been very active, a complete exchange or mixture of elements has been operated.

Metalliferous lodes are often seen either in the uplifted or in the plutonic rock. They penetrate both, and are most abundant at the points of contact.

As concerns minerals produced during metamorphism by contact, they are very numerous, as we have already shown in our preceding papers, and they are much the same for the plutonic rock and the strata which it has uplifted. In numerous cases these minerals have been formed from the elements of the one and the other. Quartz and spathic carbonates are very frequent where either the eruptive rock or the other contains silica and carbonates. Zeolites are more especially associated with volcanic rocks, such as lava, basalt, and trap. Tourmaline, with granitic rocks. The numerous silicates for which M. Dana formerly established the types garnet and pyroxene have been formed in the eruptive rock, and in the uplifted strata.

M. Charles Martins, the eminent botanist of Montpellier, informs us that he has discovered, among some notes taken during several scientific excursions made by him at different times, a striking proof of the correctness of a theory he propounded some time ago to esta-

* This is probably one of the chief causes of the diminution of specific gravity. —T. L. P.

blish that on mountain ranges the soil must be heated by the solar rays to a greater extent than the air; whereas in flat countries or plains the contrary must take place. The theory indicates, and experiment proves, that our atmosphere absorbs a considerable portion of the heat which comes from the sun to the earth. M. Pouillet estimates this quantity at four-tenths of the entire heat arriving at the earth from the sun at any given moment.

A sunbeam falling upon an elevated mountain-top traverses a much thinner layer of atmosphere than one which falls upon a soil level with the sea; the former must therefore distribute more heat to the summit of the mountain than the ray which continues downwards until it reaches the level of the sea can bestow upon the soil of the plain.

But the rarefied atmosphere of the mountain-top is less heated than the more condensed air of the plain. It remains evident then, that the soil of a mountainous elevation, at its surface, and at some inches below the surface, must each day be heated by the sun to a higher degree than the air which reposes upon it; whilst precisely the reverse must take place on plains which are only a little above the level of the sea.

The correctness of this theory is demonstrated by certain observations made on the Faulhorn (Alps) in August, 1842, by MM. Bravais and Peltier, and in September, 1844, by MM. Bravais and Ch. Martins, when compared with corresponding data collected at Brussels by M. Quetelet, and at Spitzbergen, in 1839, by the meteorological commission attached to the expedition of the ship *La Recherche*.

This relative elevation of the temperature of the soil exercises a powerful influence upon the physical geography of the Hautes-Alpes. To it alone must be attributed the rise of the snow-line. Any traveller who has visited these elevated regions knows that the snow is melted underneath by the heat of the ground. Often he must have remarked that when he placed his foot upon the border of a field of snow, the weight of his body caused the superficial crust to break, and observed that this crust does not repose upon the ground. Sometimes, under such icy vaults he will have seen with astonishment flowering soldanella (*Soldanella Alpina*, L., and *S. Cludii*, Thom.) and rosettes of dandelions! It is this melting of the snow which is in contact with the warmer soil that causes those immense fields of frozen water to slide down the verdant slopes and form terrible avalanches in the spring. Finally, to the warmth of the soil in these high regions must be attributed the presence of so great a variety of vegetable species, and such numbers of plants, which cover the soil at the very limits of perpetual snow. On the conical summit of the Faulhorn, at a height of 8,800 feet above the level of the sea, M. Charles Martins collected 131 species of phanerogamic plants. At the Grands-Mulets, on peaks of schistous protogine which rise from the centre of the glaciers of Mont-Blanc, 10,000 feet above the sea, 19 species were observed:—*Draba Fladnizensis*, Wulff.; *Cardamine*

bellidifolia, L. ; *Silene acaulis*, L. ; *Potentilla frigida*, Will. ; *Phyteuma hemisphæricum*, L. ; *Erigeron uniflorum*, L. ; *Pyrethrum alpinum*, Willd. ; *Saxifraga bryoïdes*, L. ; *S. Grœnlandica*, Lap. ; *S. muscoïdes*, Martins ; *Androsace Helvetica*, Gaud. ; *A. pubescens*, D. C. ; *Gentiana verna*, L. ; *Luzula spicata*, D. C. ; *Festuca Halleri*, Will. ; *Poa laxa*, Haenke. ; *P. cœsia*, Sm. ; *Agrostis rupestris*, All. ; and *Carex nigra*, All.

Also, on the 28th June, 1846, the temperature of the air in the shade being 9° 4′ (centigrade), and in the sunshine 11° 4′, the schistose gravel in which these plants grew showed a temperature of 29°. Spitzbergen, the shores of which may also be said to touch upon the snow-line, shows us, on a space of ground infinitely larger, only 82 species of phanerogamic plants.

On the Alps plants are warmed by the soil in which they grow far more than by the air which surrounds them ; a bright light favours their respiratory functions ; and so soon as the temperature descends to zero during the day a layer of recent snow preserves them from the accidental cold which generally accompanies bad weather on high mountain-ranges. Equally sensitive to cold and to heat, they can only endure a temperature ranging from 0° to + 15°. Continually moistened by the damp clouds and the wet which drops from the melting snow, they would require the most careful culture to flourish in the plains below, for the horticulturist would have to protect them at once from the chills of winter and the heat of summer, giving them constant humidity and bright light.

At Spitzbergen, on the contrary, in spite of the perpetual day which reigns during the summer, vegetation is poor and scanty, because the sunbeams, mostly absorbed by the great depth of atmosphere they traverse, and by the continuous mists, have not power to vivify by their light or by their warmth its icy ground.

Notes read before the Imperial Geological Institute of Vienna. Favoured by Count Marschall, *of Vienna.*

1.—*Metalliferous Strata of Rochlitz, on the Southern Slope of the Bohemian Sudets.*

The author of a monograph on these strata is the lately deceased Mr. E. Porth, who in 1853 successfully undertook the re-opening of the old mines in this district, abandoned some centuries ago under the pressure of unfavourable circumstances. The ores occur in a series of calcareous strata, intimately connected with the schistose quartzite of the micaceous and argillaceous schists of the South Sudets, and under circumstances analogous to those of the Scandinavian metalliferous deposits. Large masses of a mineral substance, similar to malacolite, are impregnated with sulphurets of copper, lead, zinc, and iron. With

these occur, in predominant proportions, hydrosilicates of copper, malachite, green carbonate of copper, and other minerals containing this metal in the condition of an oxide.

2.—*Sulphuriferous Strata in the Roman States.*

Sulphur is found in a calcareous marl (Upper Cretaceous) in the environs of Rimini and Cerena. The thickness of the most productive beds varies from about four to thirty-one feet. During 1857, 680 workmen produced above 10,000 cwts. of smelted sulphur. These mines are the property of a company of shareholders, having a capital of 220,000 scudi. A considerable proportion is sent, in the form of powder, to the Levant, where it is used to preserve vines against the ravages of the Oïdium.

3.—*Mineral Springs of Goritzia and Istria.*

The Montefalcone spring is situated about 2,000 paces from the sea-coast, in a natural basin, seven feet deep, twenty-eight feet long, and as broad; of nearly regular square form, and excavated in cretaceous limestone. The basin is without an outlet. The water-level rises and falls with the sea-tides, and is spontaneously restored when lowered by exhaustion. The temperature is 37° or 38° cent.; the taste is similar to that of sea-water; the smell slightly sulphuretted (like that of the surrounding limestone when freshly fractured), but transient. The surrounding swamps contain fresh water.

This mineral water contains, in 10,000 parts, 133.71 parts of solid substances, among which chloruret of natrium (96.06), chloruret of magnesium (15.32), bicarbonate of lime (1.83), sulphates of potash, natron, and lime (2.44, 6.51, and 8.76), are predominant.

The sulphurous spring of San Stefano lies about twenty English miles from the sea, and nearly twenty feet above the sea-level. Its quantity is very considerable. Temperature 36.5° to 37.5° cent. (temperature of the surrounding air 22° to 26° cent.). Taste, lixiviously insipid. Proportion of fixed substances very considerable. The strong hydrosulphurous smell, the thick white deposit, and the instantaneous deep blackening of silver coins thrown into the water, denote a considerable proportion of sulphur contained in it. There may exist a connexion between this spring and the alum-shales of Sovigniaco, not far distant.

Notices of some Meteorites, by Dr. Hörnes, Professor Wöhler, and Director W. Haidinger. Read before the Imperial Academy of Sciences, Vienna, July, 1858, and January, 1859. Communicated by COUNT MARSCHALL, *of Vienna.*

1.—*On the Meteorite of Ohaba (Transylvania).* BY DR. HÖRNES.

This meteorite fell in the night, between October 10th and 11th, 1857, at Ohaba, east of Carlsberg, in Transylvania, and was subsequently acquired for the Imperial Mineralogical Museum of Vienna. Soon after midnight of October 10th, the curate of Ohaba was frightened out of his sleep by a thunder-like noise, attended by a fiery mass moving through the serene atmosphere, in a descending direction, and finally falling on the ground with a stunning detonation. Next morning, the meteorite was found in an orchard, where it had penetrated the tough, moss-covered ground. It is completely covered with the black crust peculiar to meteorites; its shape is that of an irregular trilateral pyramid, fourteen and a half inches high; two of the irregularly curved surfaces are smooth, the third and the basal one exhibit the characteristic round impressions.

A fresh fracture at the base exhibits the interior, of a light green colour, slightly tinged with dark bluish grey, with indistinct spherical concretions, a great plenty of coarse and fine particles of metallic iron, very minute particles of magnetic sulphuret of iron, and a very scarce admixture of olivine. The crust is thin and opaque.

This meteorite is very similar to that of Château-Renard (June 12th, 1841; weight, between 70 and 80 lbs.); and on account of the indistinct form of its spherical concretions, it must take its place amongst Partsch's "Normal Meteorites." It weighs 29 lbs.; its specific gravity is 3.11. An analysis, made by Dr. Buckeisen, in Professor Wöhler's laboratory, proved it to be a compound of olivine, augite, and a felspar-like mineral, with interspersed particles of metallic and sulphuretted iron.

2.—*On the Meteorite of Kaba (Hungary).* BY DR. HÖRNES.

This meteoric stone fell April 15th, 1857, near Kaba, south-west of Debreczin, in Central Hungary. About 10 P.M. an inhabitant of Kaba, sleeping in the open air, was awakened by a noise, different from that of thunder, as he described it, and perceived in the serene sky a luminous globe, of dazzling brightness, following a parabolic course during four seconds. This phenomenon was observed by several inhabitants of the same place. As one of them was riding

out the next morning, his horse was frightened by the sight of a black stone, deeply bedded in the soil of the road, the ground around it being depressed and creviced. When dug out the meteorite weighed about 7 lbs. The finder broke off some fragments, and the remainder, weighing 5¼ lbs., was deposited in the Museum of the Reformed College at Debreczin. This meteorite has the shape and size of a small loaf of bread. Its crust is black, covered with concentrically radiate furrows and tubercles. Its mass is greyish-black, with globular concretions, and acts energetically on the magnetic needle. Its internal structure, in general features different from that of any meteorite hitherto known, most resembles in its structure that which fell at Renazzo.

The Kaba meteorite has been found to contain a certain quantity of carbon, together with another substance into the composition of which carbon enters. Professor Wöhler, of Göttingen, found the composition of this substance to bear a great analogy with certain minerals of a wax-like constitution, such as ozokerite, scheererite, &c., which are all carburets of hydrogen.

3.—*On the Meteorite of Kakowa* (*Banat*). By Professor Wöhler and M. Haidinger.

The fall of this meteoric stone, on May 19th, 1858, at 8 A.M., was attended with the usual phenomena: a small black cloud in the air, a hissing and thunder-like noise, heard at two Austrian (five English) miles distance, a short and loud explosion at the moment when the stone—in a state of considerable heat—touched the ground, into which it penetrated to a depth of three inches. Lieutenant-General Count Coronini, Governor of the Banat, sent the stone to the Imperial Geological Institute, and it is now added to the rich collection of meteorites in the Imperial Museum of Mineralogy.

The meteorite of Kakowa (although complete as in the moment of its fall) bears the appearance of being a fragment from a larger mass, with markedly rounded angles and edges, and a black cortical substance, about half an inch thick, extending into the interior in the shape of a vein. Minute particles of metallic iron are nearly uniformly spread throughout the whole stone.

Professor Wöhler submitted it to an analysis. The portions extracted by the magnet give: metallic iron, 82.95; nickel, 11.41; cobalt, 1.08; and inappreciable quantities of phosphorus, copper, and oxide of chrome.

The analysis by means of carbonates of potash and soda gave: silica, 41.14; magnesia, 27.06; oxidulated iron, 27.47; lime, 0.68; and some oxidulated manganese.

Fluoric acid decomposed the substance of the meteorite into: silica, 41.96; magnesia, 27.06; oxidulated iron, 23.95; alumina,

2.46 ; lime, 0.81 ; oxidulated manganese, 0.39 ; soda, 1.92 ; potash, 0.56 ; graphite, 0.15 ; nickel, 0.20 ; and sulphur, a trace.

Hydrochloric acid reduced it into undecomposed silicates, 43.3, and decomposed silicates, 56.7 ; these last giving, by means of further operations, a per centage of silica, 19.5 ; magnesia, 11.2 ; oxidulated iron, 24.4 ; nickel, 0.2 ; lime, 0.7 ; and sulphur, a trace ; so that they may be considered to be a mineral substance analogous to *olivine*, with a very large proportion of oxide of iron, as occurs in many other meteorites. The per centage of the insoluble portion is : silica, 50.49 ; magnesia, 36.84 ; lime, 1.88 ; alumina, 5.71 ; soda, 4.45 ; and potash, 0.59 ; representing, according to Sartorius von Waltershausen, an aggregate of 82.17 of magnesian wollastonite, and 17. of anorthite, with the difference only that these two minerals as they generally occur are decomposable by acids.

Mr. Haidinger added some remarks on the theory of meteorites, tending to prove that the opinion of the formation of meteorites by immediate aggregation of the gaseous or extremely subtle matters dispersed through the cosmic spaces, is, in all probability, very far from the truth. A temperature of from 50° to 91° cent. (as calculated to exist within these spaces) is a very unfavourable condition for the crystalline arrangement of material atoms. It is more probable that a reaction from the interior to the surface is going on within an already formed aggregate of substance, which, by mutual and opposite pressure, and with the assistance of heat (a natural consequence of it), shapes the component particles into a stone-like compound. Subsequent eruptions may then have detached and thrown off minor portions of the whole, and of these some reach the surface of the globe. Humboldt, in his "Cosmos," alludes to the improbability of a sometimes highly developed crystallizing process going on during the brief time of the passage of meteorites across the terrestrial atmosphere.

On the Fossil Mammalia of the Vienna Tertiary Strata. By Professor E. Suess. *Read before the Imperial Academy of Sciences, Vienna, June,* 1858. *Communicated by* Count Marschall.

The supposed complete identity of the faunæ of the Leitha limestone, the Congeriæ-beds, and the sands of Belvedere (Vienna), does not really exist, although a few species are found throughout the whole series. The species of *Hippotherium* and *Sus* peculiar to the Congeriæ-beds and the Belvedere sands are nowhere co-existent with the *Psephophorus* and the *Cervidæ* of the Leitha limestone. *Dinotherium* seems to be common to both these faunæ. The remains of mastodons, long ago identified with the species, from Eppelsheim, described by Professor Kaup (for instance, the ramus of a lower jaw, found by Count Breunner, near Kremms, in Lower Austria, and figured by Cuvier as *Mastodon angustidens*, the two rami of a lower jaw, and

the large tusk from the upper jaw, found at Belvedere in 1827, and described by Dr. Fitzinger, under the same denomination, and lately by Professor Kaup,* who had received a sketch of it from Professor Suess, as *M. Arvernensis*), must all be placed in the group of *Tetralophodontes*. A lower jaw from Belvedere, in Professor Leydelt's possession, having on each side a rather long tusk, with straight longitudinal flutings, may have belonged to a male individual, while the other specimens, above enumerated, may have belonged to females. Professor Suess, in accordance with Dr. Falconer's Monograph,† assigns to this species the name of *Mastodon* (*Tetralophodon*) *longirostris* (although retracted by Professor Kaup himself), reserving the specific name *M. Arvernensis* for the species with alternating, not opposite, dental protuberances.

The only known specimen of a *mastodon* found in the Leitha limestone was found in 1816, near Loretto, and is preserved in the Imperial Museum of Vienna. It is a ramus of the lower jaw from a young individual. It is essentially different from all the remains found in the sands of Belvedere, and belongs, on account of its dental structure, to the group of *Trilophodontes*.

According to the author, like differences hold good with the several species of *Rhinoceros* from these localities.

On some Erratic Phenomena in Hungary. By Professor E. Suess. *Read before the Imperial Geological Institute of Vienna, July*, 1858. *Communicated by* Count Marschall.

Erratic phenomena on the west side of the Rosalia Mountain-group (between Lower Austria and Hungary) were made known some years since by MM. de Morlot and Czjzek. Similar phenomena have recently been traced out by Prof. Suess on the eastern or Hungarian slope, in the Ratterer ravine near Marz. A deposit of irregular and rounded fragments, derived from the neighbouring mountains (Schneeberg, Wechsel, and Neuewelt), lies, several fathoms thick, beneath the loess. The calcareous fragments exhibit distinct ice-groovings, and some show the chain-like perforations made by the *Voia*; and there are shells of an oyster (very like *Ostrea edulis*) fixed on the blocks and directly upon the glacial grooves. The intercalated sandy beds contain fragments of a *Nucula* or *Yoldia*, and internal casts of a bivalve referable to the family of the *Lucinæ*. From these facts the author infers that this portion of the Vienna Basin, after having gradually passed, during the neogene (younger tertiary) period, from the condition of a marine bay into that of a fresh-water lake, again underwent an irruption of the sea.

* Beiträge zur nähern Kenntniss der urweltlichen Säugthiere, vol. iii. 1857, Pl. II. fig. 3.

† Quart. Journ. Geol. Soc., vol. xiii. p. 307.

Further researches may clear up the relation of these faunæ with the glacial faunæ of the Frith of Clyde and of Uddewaller, and throw perhaps some new light on the analogies between the younger molluscan faunæ of Sicily and England, at first so ingeniously exposed by the late Prof. Edward Forbes.

PROCEEDINGS OF GEOLOGICAL SOCIETIES.

GEOLOGICAL SOCIETY OF LONDON.—*May 4th*, 1859. The following communications were read :—

1. "On the Ossiferous Cave, called 'Grotta di Maccagnone,' near Palermo." By Dr. H. Falconer, F.R.S., F.G.S.

In a letter, dated Palermo, March 21, 1859, and addressed to Sir C. Lyell, V.P.G.S., Dr. Falconer first states, that from the caves along the coast between Palermo and Trapani he has lately obtained remains of *Elephas antiquus*, *Hippopotamus Pentlandi*, *H. siculus*, *Sus priscus* (?), *Equus*, *Bos*, *Cervus intermedius* and another species, *Felis*, *Ursus*, and *Canis*, and coprolites of *Hyæna;* but no remains of *Rhinoceros*, nor of *Elephas primigenius*. These additions to the previously ascertained faunæ of the cave-period in Sicily may aid in putting it in relation with the Newer Tertiary deposits of Italy.

The author then proceeds to describe the Grotta di Maccagnone, a previously undescribed ossiferous cave, in the Hippurite-limestone, westward of the Bay of Carini (between Palermo and Trapani). In the breccia below its entrance he met with remains of *Hippopotamus* in abundance, and remains of *Elephas antiquus* in the upper deposit of humus within the cave. But some other fossils were discovered under very interesting and somewhat anomalous conditions in this cave. The interior of the cavern is lined with stalagmite; and at a spot on the roof, where this is denuded, Dr. Falconer found a large patch of bone-breccia containing teeth of Ruminants, bits of carbon, shells of several species of *Helix*, and a vast abundance of flint and hornstone knives of human manufacture. At other places, and wherever the author had the calcareous coating broken by hammers, he found similar remains. At one spot, on breaking the stalagmite, he found against the roof of the cave a thick calcareo-ochreous layer containing abundance of the coprolites of a large *Hyæna*.

Dr. Falconer draws the following inferences from the study of these facts :—(1.) That the Maccagnone Cave was filled up to the roof within the human period, so that a thick layer of bone-splinters, teeth, land-shells, and human objects was agglutinated to the roof by the infiltration of water holding lime in solution. (2.) That the coprolites of a large *Hyæna* were similarly cemented to the roof at the same period. (3.) That subsequently, and within the human period, such a great amount of change took place in the physical configuration of the district as to have caused the cave to be washed out and emptied of its contents, excepting the patches of material cemented to the roof and since coated with additional stalagmite.

2. "On the Jurassic Flora." By Baron Achille de Zigno. Communicated by C. Bunbury, Esq., F.G.S.

In studying the numerous specimens of Jurassic Plants discovered in the Venetian Alps, Sig. de Zigno has found it necessary to pass in revision all the known species derived from the Jurassic strata in different countries. In preparing his