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Mém. Soc. Sci. Hainaut.—Mémoires et Publications de la Société des Sciences, des Arts et des Lettres du Hainaut. Mons.

Mém. Soc. Sci. Nat. Neuchâtel.—Mémoires de la Société des Sciences Naturelles de Neuchâtel.

Mém. Soc. Sci. Phys. Nat. Toulouse.—Mémoires de la Société des Sciences Physiques et Naturelles de Toulouse.

Micr. Journ.—Monthly Microscopical Journal, and Transactions of the Royal Microscopical Society. London.

Min. Journ.—Mining Journal. Fol. London.

Min. Mag.—The Mineralogical Magazine and Journal of the Mineralogical Society of Great Britain and Ireland. London and Truro.

Min. Mitth.—Mineralogische Mittheilungen. 4to. Vienna.

Miscell. Papers Kent Sci. Inst.—Miscellaneous Papers of the Kent Scientific Institute [U. S. A.].

Mitth. geogr. Anst.—Mittheilungen aus Justus Perthes geographischer Anstalt, über wichtige neue Erforschungen auf der Gesammtgebiete der Geographie von A. Petermann. Gotha.

Mitth. Jahrb. k. ung. geol. Anst.—Mittheilungen aus dem Jahrbuche der kön.-ungarischen geologischen Anstalt. Budapest.

Mitth. k.-k. geogr. Ges.—Mittheilungen der kaiserlich-königlichen geographischen Gesellschaft. Vienna.

Mitth. nat. Ges. Bern.—Mittheilungen der naturforschenden Gesellschaft in Bern.

Monatsb. k. preuss. Ak. Wiss.—Monatsberichte der königlich preussischen Akademie der Wissenschaften zu Berlin.

Monthly Notices R. Soc. Tasm.—Monthly Notices of Papers and Proceedings of the Royal Society of Tasmania. Hobart Town.

Nachricht k. Ges. Wiss. Göttingen.—Nachrichten von der königlichen Gesellschaft der Wissenschaften und der Georg-August Universität, Göttingen.

Naturaleza.—La Naturaleza. Periodico cientifico de la Sociedad Mexicana de Historia Natural. 4to. Mexico.

Naturalist.—The Naturalist: Journal of the West-Riding Naturalists' Society, and General Field-Club Record. Huddersfield.

Nature.—Nature, a weekly illustrated Journal of Science. 4to. London.

N. Jahrb.—Neues Jahrbuch für Mineralogie, Geologie und Paläontologie. Stuttgart.

Notizbl. Ver. Erdk. Darmstadt.—Notizblatt des Vereins für Erdkunde und verwandte Wissenschaften zu Darmstadt und des mittelrheinischen geologischen Vereins. Darmstadt.

Nova Acta Ac. Cæs. Leop.-Car.—Nova Acta Physico-Medica Academiæ Cæsareæ Leopoldino-Carolinæ Germanicæ Naturæ Curiosorum. Dresden.

N. Staff. Field Club Papers.—North Staffordshire Field Club. Annual Addresses, Papers, etc. Hanley.
Nyt Mag. Nat.—Nyt Magazin for Naturvidenskaberne. Christiania.

Oest. Zeit. Berg-Hutt.—Oesterreich Zeitung für Berg- und Huttenmann.
Öfv. Finska Vet. Soc. Förh.—Öfversigt af Finska Vetenskaps-Societetens Förhandlingar. Helsingfors.
Öfv. K. Vet.-Akad. Förh.—Öfversigt af Kongl. Vetenskaps-Akademiens Förhandlingar. Stockholm.

Palæontographica.—Palæontographica. Beiträge zur Naturgeschichte der Vorwelt. 4to. Cassel.
Pal. Franç.—Paléontologie Française, ou description des fossiles de la France, continuée par une réunion de paléontologistes sous la direction d'un comité spécial. 4to. Paris.
Pal. Soc.—Palæontographical Society [Monographs of]. 4to. London.
Papers Eastbourne Nat. Hist. Soc.—Papers of the Eastbourne Natural-History Society. 4to.
Penn Monthly.—The Penn Monthly Magazine. Philadelphia.
Phil. Mag.—London, Edinburgh, and Dublin Philosophical Magazine and Journal of Science. London.
Phil. Trans.—Philosophical Transactions of the Royal Society of London. 4to.
Pogg. Ann.—Annalen der Physik und Chemie. Herausgegeben zu Berlin von J. C. Poggendorff. Leipzig.
Pop. Sci. Rev.—Popular Science Review. London.
Proc. Ac. Nat. Sci. Philad.—Proceedings of the Academy of Natural Sciences of Philadelphia.
Proc. Amer. Ac.—Proceedings of the American Academy of Arts and Sciences. Boston.
Proc. Amer. Assoc.—Proceedings of the American Association for the Advancement of Science. Salem.
Proc. Amer. Phil. Soc.—Proceedings of the American Philosophical Society held at Philadelphia for promoting Useful Knowledge. Philadelphia.
Proc. Assoc. Munic. Eng.—Proceedings of the Association of Municipal Engineers.
Proc. Bath Field Club.—Proceedings of the Bath Natural-History and Antiquarian Field Club.
Proc. Belfast Field Club.—Annual Report and Proceedings of the Belfast Naturalists' Field Club.
Proc. Belfast Nat. Hist. Phil. Soc.—Proceedings of the Belfast Natural History and Philosophical Society.
Proc. Berwick. Nat. Club.—Annual Report and Proceedings of the Berwickshire Naturalists' Club. Alnwick.
Proc. Boston Soc. Nat. Hist.—Proceedings of the Boston Society of Natural History. [United States.]
Proc. Bristol Nat. Soc.—Proceedings of the Bristol Naturalists' Society. London and Bristol.
Proc. Calif. Ac. Sci.—Proceedings of the California Academy of Natural Sciences. San Francisco.
Proc. Cotteswold Club.—Proceedings of the Cotteswold Naturalists' Field Club. Gloucester.
Proc. Davenp. Ac. Nat. Sci.—Proceedings of the Davenport Academy of Natural Sciences. Davenport, Iowa.

Proc. Geol. Assoc.—Proceedings of the Geologists' Association. London.
Proc. Geol. Soc. W. Riding Yorksh.—Proceedings of the Geological and Polytechnic Society of the West Riding of Yorkshire. Leeds.
Proc. Inst. Civ. Eng.—Minutes of Proceedings of the Institution of Civil Engineers. London.
Proc. Inst. Mech. Eng.—Proceedings of the Institute of Mechanical Engineers. Birmingham.
Proc. Lit. Phil. Soc. Liverpool.—Proceedings of the Literary and Philosophical Society of Liverpool.
Proc. Lit. Phil. Soc. Manch.—Proceedings of the Literary and Philosophical Society of Manchester.
Proc. Liverpool Geol. Soc.—Abstract of the Proceedings of the Liverpool Geological Society.
Proc. Lyc. Nat. Hist. New York.—Proceedings of the Lyceum of Natural History of the City of New York.
Proc. Nat. Hist. Soc. Glasg.—Proceedings of the Natural History Society of Glasgow.
Proc. Phil. Soc. Glasg.—Proceedings of the Philosophical Society of Glasgow.
Proc. R. Geogr. Soc.—Proceedings of the Royal Geographical Society. London.
Proc. R. Inst.—Notices of the Proceedings at the Meetings of the Members of the Royal Institution of Great Britain, with abstracts of the discourses delivered at the Evening-meetings. London.
Proc. R. Irish Acad.—Proceedings of the Royal Irish Academy, Dublin.
Proc. R. Phys. Soc. Edin.—Proceedings of the Royal Physical Society of Edinburgh.
Proc. R. Soc.—Proceedings of the Royal Society of London.
Proc. R. Soc. Edin.—Proceedings of the Royal Society of Edinburgh.
Proc. Somerset Archæol. Nat. Hist. Soc.—Proceedings of the Somerset Archæological and Natural-History Society. Taunton and London.
Proc. S. Wales Inst. Eng.—Proceedings of the South Wales Institute of Engineers.
Proc.-verb. Soc. Mal. Belg.—Procès-verbaux de la Société Malacologique de Belgique. Brussels.
Proc.-verb. Soc. Belg. Micr.—Procès-verbaux de la Société Belge de Microscopie. Brussels.
Proc. Warwick. Field Club.—Proceedings of the Warwickshire Naturalists' and Archæologists' Field Club. Warwick.
Proc. W. Lond. Sci. Assoc.—Proceedings of the West London Scientific Association and Field Club.
Proc. Zool. Soc.—Proceedings of the Scientific Meetings of the Zoological Society of London.

Quart. Journ. Geol. Soc.—The Quarterly Journal of the Geological Society of London.
Quart. Journ. Micr. Sci.—The Quarterly Journal of Microscopical Science. London.
Quart. Journ. Sci.—Quarterly Journal of Science. London.
Queenslander.—The Queenslander. Fol. Brisbane.

R. Sch. Mines Mag.—The Royal School of Mines' Magazine.
Ramietnik Ak. umiej. Krakow. math.-przyr.—Ramietnik Akademii umiejetnosci iv Krakowie. Wydzial matematyczno-przyrodniczy. 4to. Cracow.
Rec. Geol. Surv. Ind.—Records of the Geological Survey of India. Calcutta.
Rend. Ac. Sci. Ist. Bologna.—Rendiconti delle Sessioni dell'Accademia delle Scienze dell' Istituto di Bologna.

Rend. Ac. Sci. Napoli.—Rendiconti della Accademia delle Scienze fisiche e matematiche di Napoli. 4to. Naples.
Rend. R. Ist. Lomb.—Rendiconti del Reale Istituto Lombardo di Scienze e Lettere. Milan.
Rep. Brit. Assoc.—Report of the British Association for the Advancement of Science. London.
Rep. Miners' Assoc. Cornwall.—Reports and Proceedings of the Miners' Association of Cornwall and Devonshire. Falmouth.
Rep. Rugby School Nat. Hist. Soc.—Report of the Rugby-School Natural-History Society.
Rep. Teign Nat. Club.—Report of the Proceedings of the Teign Naturalists' Field Club.
Rep. U. S. Geol. Expl. 40 Par.—Report of the United States Geological Exploration of the 40th Parallel.
Rep. U.S. Geol. Surv. Territories.—Report of the United-States Geological Survey of the Territories. 4to. Washington.
Rep. Winchester Coll. Nat. Hist. Soc.—Report of the Winchester College Natural-History Society.
Rev. Géol.—Revue de Géologie (by Delesse and De Lapparent). Paris.
Rev. Mar. Col.—Revue Maritime et Coloniale. Paris.
Rev. Min.—Revista Minera. Madrid.
Rev. Sci.—Revue Scientifique de la France et de l'Étranger. 4to. Paris.
Rev. Sci. Nat.—Revue des Sciences Naturelles. Montpellier.
Rev. Univ. Mines.—Revue Universelle des Mines, de la Métallurgie, des Travaux Publics, des Sciences et des Arts appliqués à l'Industrie. Paris.
Russ. Rev.—Russische Revue. (Röttgers.) St. Petersburg.

Schrift. phys.-oekon. Ges. Königsberg.—Schriften der physikalisch-oekonomischen Gesellschaft zu Königsberg. 4to.
Sci. Contemp. La Scienza Contemporanea. Messina.
Sci. Goss.—Hardwicke's Science Gossip. London.
Sitz. Ges. Beförd. gesammt. Nat. Marburg.—Sitzungsberichte der Gesellschaft zur Beförderung der gesammten Naturwissenschaften zu Marburg.
Sitz. Ges. nat. Freunde Berlin.—Sitzungs-Bericht der Gesellschaft naturforschender Freunde zu Berlin.
Sitz. Isis Dresden.—Sitzungs-Berichte der naturwissenschaftlichen Gesellschaft Isis in Dresden.
Sitz. k. Ak. Wiss. Wien, math.-nat. Cl.—Sitzungsberichte der kaiserlichen Akademie der Wissenschaften, mathematisch-naturwissenschaftliche Classe. Vienna.
Sitz. k. böhm. Ges. Wiss.—Sitzungsberichte der königlichen böhmischen Gesellschaft der Wissenschaften. Prague.
Sitz. math.-phys. Cl. k.-bay. Ak. Wiss.—Sitzungsberichte der mathematisch-physikalischen Classe der königlich-bayerischen Akademie der Wissenschaften zu München. Munich.
Sitz. Nat.-Ges. Dorpat.—Sitzungsberichte der Naturforscher-Gesellschaft zu Dorpat.
Sitz. nat. Ges. Hannover.—Sitzungsberichte der naturforscher Gesellschaft in Hannover.
Sitz. nat. Ges. Leipzig.—Sitzungsberichte der naturforschenden Gesellschaft zu Leipzig.
Sitz. phys.-med. Soc. Erlangen.—Sitzungsberichte der physikalisch-medicinischen Societät zu Erlangen.
Skand. Nat. Forh.—Skandinavisk Naturforskerinödet Forhandlinger. Copenhagen.

Sver. Geol. undersökn.—Sveriges Geologiska Undersökning. [Swedish Geological Survey.] Stockholm.

Trans. Ac. Sci. St. Louis.—The Transactions of the Academy of Science of St. Louis [Missouri].
Trans. Albany Inst.—Transactions of the Albany Institute.
Trans. Amer. Inst. Min. Eng.—Transactions of the American Institute of Mining Engineers.
Trans. Amer. Phil. Soc.—Transactions of the American Philosophical Society held at Philadelphia for promoting Useful Knowledge.
Trans. Amer. Soc. Civ. Eng.—Transactions of the American Society of Civil Engineers.
Trans. Bot. Soc. Edin.—Transactions and Proceedings of the Botanical Society of Edinburgh.
Trans. Camb. Phil. Soc.—Transactions of the Cambridge Philosophical Society. 4to.
Trans. Clifton Coll. Sci. Soc.—Transactions of the Clifton-College Scientific Society. Clifton (Bristol).
Trans. Conn. Ac. Sci.—Transactions of the Connecticut Academy of Arts and Sciences. Newhaven.
Trans. Cumb. Assoc.—Transactions of the Cumberland Association for the Advancement of Literature and Science. Keswick.
Trans. Devon. Assoc.—Transactions of the Devonshire Association for the Advancement of Science, Literature, and Art. Plymouth.
Trans. Edin. Geol. Soc.—Transactions of the Edinburgh Geological Society.
Trans. Geol. Soc. Glasg.—Transactions of the Geological Society of Glasgow.
Trans. Hist. Soc. Lanc. Chesh.—Transactions of the Historical Society of Lancashire and Cheshire. Liverpool.
Trans. Inst. Surv.—Transactions of the Institution of Surveyors. London.
Trans. Linn. Soc.—Transactions of the Linnean Society. 4to. London.
Trans. Manch. Geol. Soc.—Transactions of the Manchester Geological Society.
Trans. N. Engl. Inst. Eng.—North-of-England Institute of Mining and Mechanical Engineers. Transactions. Newcastle-on-Tyne.
Trans. Nov. Scot. Inst.—Transactions of the Nova-Scotian Institute of Natural Science. Halifax, N. S.
Trans. N. Zealand Inst.—Transactions and Proceedings of the New-Zealand Institute. Wellington.
Trans. Plymouth Inst.—Annual Report and Transactions of the Plymouth Institution.
Trans. R. Geol. Soc. Cornw.—Transactions of the Royal Geological Society of Cornwall. Penzance.
Trans. R. Irish Acad.—Transactions of the Royal Irish Academy. 4to. Dublin.
Trans. R. Soc. Edin.—Transactions of the Royal Society of Edinburgh. 4to.
Trans. R. Soc. N. S. Wales.—Transactions of the Royal Society of New South Wales. Sydney.
Trans. R. Soc. Vict.—Transactions and Proceedings of the Royal Society of Victoria. Melbourne.
Trans. Watford Nat. Hist. Soc.—Transactions of the Watford Natural-History Society and Hertfordshire Field Club. Watford and Hertford.
Trans. Wisconsin Ac. Sci.—Transactions of the Wisconsin Academy Sciences, Arts, and Letters. Madison, Wisconsin.

Trans. Woolhope Field Club.—Transactions of the Woolhope Naturalists' Field Club. Hereford.
Trans. Zool. Soc.—Transactions of the Zoological Society of London. 4to.

Verh. k.-k. geol. Reichs.—Verhandlungen der kaiserlich-königlichen geologischen Reichsanstalt. Vienna.
Verh. nat. Ges. Basel.—Verhandlungen der naturforschenden Gesellschaft in Basel.
Verh. Nat. Ver. Brünn.—Verhandlungen des Naturforschender Vereins zu Brünn.
Verh. nat. Ver. Carlsruhe.—Verhandlungen des naturwissenschaftlichen Vereins in Carlsruhe.
Verh. nat. Ver. preuss. Rheinl.—Verhandlungen des naturhistorischen Vereins der preussischen Rheinlande und Westfalens. Bonn.
Verh. schweiz. nat. Ges.—Verhandlungen der schweizerischen naturforschenden Gesellschaft. Schaffhausen.
Verh. Ver. nat. Unt. Hamburg.—Verhandlungen des Vereins für naturwissenschaftliche Unterhaltung zu Hamburg.
Verh. Würzb. phys.-med. Ges.—Verhandlungen der physikalisch-medicinischen Gesellschaft in Würzburg.
Versl. Med. Kon. Ak. Wet.—Verslagen en Mededeelingen der Koninklijke Akademie van Wetenschappen. Amsterdam.
Vid. Medd. Nat. Foren. Kjöbenhavn.—Videnskabelige Meddelelser fra den Naturhistoriske Forening i Kjöbenhavn.
Vierteljahrsschrift nat. Ges. Zürich.—Vierteljahrsschrift der naturforschenden Gesellschaft in Zürich.

Wilts. Archæol. & Nat. Hist. Mag.—The Wiltshire Archæological and Natural-History Magazine, published under the direction of the Society founded in that county. Devizes.
Wochl. österr. Ing.-Arch.-Ver.—Wochlichebericht des österrische Ingenieur- und Architekten-Vereins.

Yorksh. Phil. Soc.—Communications to the Monthly Meetings of the Yorkshire Philosophical Society. [Published with the Annual Report of the Council of the Society.]

Zapiski Imp. S. Peterb. Min. Obw.—Zapiski Imp. S. Peterburgskago Mineralogitcheskago Obwestva.
Zapiski Novoruss. Obw. Estest.—Zapiski Novorussüskago Obwestva Estestvorspitatelei, Odessa.
Zeitsch. allgem. österr. Apothek-Ver.—Zeitschrift der allgemeine österreichische Apothek-Vereins.
Zeitsch. Berg-, Hütt. Salinenw.—Zeitschrift für das Berg-, Hütten- u. Salinenwesen im preussischen Staate. 4to. Berlin.
Zeitsch. Berg- Hütt. Ver. Kärnthen.—Zeitschrift der Berg- und Hüttenmännischen Vereins für Kärnthen. Klagenfurt.
Zeitsch. deutsch. geol. Ges.—Zeitschrift der deutschen geologischen Gesellschaft. Berlin.
Zeitsch. deutsch-österr. Alpenver.—Zeitschrift des deutsch-österreichischen Alpenvereins.
Zeitsch. gesammt. Nat.—Zeitschrift für die gesammten Naturwissenschaften. Originalabhandlungen und monatliches Repertorium der . . . Geologie, Oryktognosie, Palæontologie . . . Berlin.

THE

GEOLOGICAL RECORD

FOR 1876.

STRATIGRAPHICAL AND DESCRIPTIVE GEOLOGY.

1. *BRITISH ISLES.*

Adams, Prof. A. L. Report on the Exploration of the Shandon Cave. *Trans. R. Irish Acad.* vol. xxvi. pt. v. pp. 187–230; plate and 2 woodcuts.

This cave, about a mile from Dungarvan, co. Waterford, appears to be the first Irish cavern in which Pleistocene remains have been found. It was discovered and a collection of bones made (now deposited in the Royal Dublin Society's Museum) in 1859. It was then thought to have been cleared of bones; but in 1870 the author, with Prof. Harkness, obtained several vertebræ of mammoth. The exploration described was made in 1875. The cave is one of many in the Carboniferous rocks of the Colligan valley. Quarrying operations had removed a great part of the limestone-cliff, and the present entrance is many yards from the original one. It was filled up with a limestone-breccia cemented with stalagmite, on removing which many bones were found. Penetrating further, the men broke into a new chamber of some extent, but low, in which also a number of bones were got. The united collections of this and the former explorations have yielded remains of 16 species of mammals and birds. The cave was a large shelter-shed, the resort of many of the animals whose bones were found. The valleys of the Colligan and Blackwater were probably favourite ground for Quaternary animals; and in all likelihood the rock cavities in which they abound would yield a large harvest if explored. E. T. H.

Aitken, John. Observations on the Unequal Distribution of Drift on opposite sides of the Pennine Chain, in the country about the source of the River Calder, with suggestions as to the Causes which led to that result, together with some Notices on the High-Level Drift in the Upper Part of the Valley of the River Irwell. *Quart. Journ. Geol. Soc.* vol. xxxii. pp. 184–190; and *Trans. Manch. Geol. Soc.* vol. xiv. pp. 50–71.

On the W. side of the Pennine Chain the Drift occurs as a widespread deposit from the sea-level to 1200 feet, whilst stray boulders are

found 200 feet higher. On the E. side of the chain there are wide areas of rock without any Drift. The author supposes that the valleys on the E. side were blocked by congealed snow and ice, forming a barrier to the great northern glacier, which was then deflected westwards. W. T.

Andrew, Thomas. Observations on the Recent Floods in the Dawlish Valley. *Trans. Devon. Assoc.* vol. viii. pp. 461–466.

Describes the effect of an extraordinary rainfall on October 19, 1875, when 3·26 inches fell in 3 hours at Exeter; and shows that the presence of boulders in the valley near Dawlish may be due to the action of water, and not of ice. T. M. H.

Anon. [**H. Woodward.**] Glacial Deposits at York. *Geol. Mag.* dec. ii. vol. iii. p. 384.

Notice of photographs of sections in railway-cuttings.

——. On some interesting Remains at Borness, Kirkcudbrightshire. *R. Sch. Mines Mag.* vol. i. pp. 31, 32.

Notice of a cave about 25 feet above high-water mark, containing bones of existing species and human remains. (Chiefly from a paper in *Proc. Ant. Scot.* vol. x., by **A. J. Corrie, W. Bruce-Clarke,** and **A. R. Hunt.**) W. T.

——. Field Meeting (at Watford). *Trans. Watford Nat. Hist. Soc.* vol. i. pt. iii. pp. xv, xvi. [See Geological Record for 1875, p. 2.]

Notes the Drift, Chalk, and Chalk-springs at Otterspool.

——. Field Meetings.—Colne Valley Water Works, Bushey Kiln, and Watford Heath Kiln.—Aldbury, Ashridge Park, and Berkhampstead. *Trans. Watford Nat. Hist. Soc.* vol. i. pt. iv. pp. xviii, xix, xxi.

The Chalk, Lower Tertiaries, and Glacial Drift were examined.

A Tertiary outlier, capped with Drift, at Berkhampstead.

——. Excursion to Creswell Crags. *Naturalist*, ser. 2, vol. i. p. 174.

Bones and teeth of hyæna, horse, &c.; worked flints and charcoal were found in the cave-breccia.

——. [**W. D. Roebuck.**] Excursion to Coxley Valley. *Naturalist*, ser. 2, vol. i. pp. 175, 176.

Mr. J. Tindall described the geology of the district, naming the various coals in a series over 1000 feet thick, and giving a list of fossils. W. H. D.

——. [Notice of a Section at the Surrey Commercial Docks.] *Sci. Goss.* no. 133, p. 20.

The cutting is 40 feet deep, through alluvium, with a forest-bed and gravel.

Anon. [**H. P. M.**] Subwealden Explorations. *Land and Water*, Sept. 23.
Remarks on the boring and its results.

——. [**M. Knights.**] The Antiquity of Man. Account of a Geological Ramble around Brandon, and of a Discovery of Remains of Pre-historic Man. Reprinted from the *Eastern Daily Press*, October. Pp. 16.
Describes the great chalky boulder clay, and notes the evidence brought forward by Mr. Skertchly (see p. 33) to support his discovery of palæolithic implements in brickearth, supposed to be beneath this clay. H. B. W.

——. The Channel Tunnel. *Chambers's Journal*, September.

——. Lincolnshire, or East Notts Coal Exploration. *Coll. Guard.* vol. xxxi. p. 136.
Coal Measures reached by boring at a depth of 1900 feet.

——. Coal Winning in the Gwendraeth Valley, Caermarthenshire. *Coll. Guard.* vol. xxxi. p. 253.
The "Big Vein," 8 feet thick, struck at 45 yards at the Trimsaran Colliery.

——. Important Find of Coal in Lanarkshire. *Coll. Guard.* vol. xxxi. p. 390. From the *Hamilton Advertiser*.

Argall, W. H. On the Elvan-courses of Cornwall. *Rep. Miners' Assoc. Cornwall* for 1875, pp. 37–64; 10 woodcuts.
Gives various particulars, such as composition, size, and direction, of 147 elvan-courses.

Argyll, Duke of. On the Physical Structure of the Highlands, in connection with their Geological History. *Nature*, vol. xiv. pp. 435–438. (Brit. Assoc.)

Aveline, W. T. Absence of Llandovery Rocks in the Lake District. *Geol. Mag.* dec. ii. vol. iii. p. 282.
The Stockdale (=Tarannon) Shales underlie the Coniston (=Denbighshire) Grits and Flags. A very slight break separates the Stockdale Shales and the Coniston (=Bala) Limestone; and a great break occurs between the last and the Volcanic series. [See **Hicks**, p. 16.]
W. H. D.

——. The Silurian Rocks of the Lake District. *Geol. Mag.* dec. ii. vol. iii. p. 376.
The Tarannon Shales in Wales overlie the Llandovery Rocks. [See **Hicks**, p. 16.]

——. The Graptolitic Mudstones of the Lake District. *Geol. Mag.* dec. ii. vol. iv. p. 527.
From the base of the mudstones to the top of the Bannisdale Beds

there is no unconformity, nor even a sharp junction. [See **Hicks**, p. 16.] W. H. D.

Barrois, Dr. Ch. Recherches sur le Terrain Crétacé supérieur de l'Angleterre et de l'Irlande. [Upper Cretaceous of England and Ireland.] *Mém. Soc. Géol. Nord*, pp. 234; 3 plates (maps and sections), many woodcuts. (A Summary in *Ann. Soc. Géol. Nord*, t. iii. pp. 189–205.)

Points out the insufficiency of previous descriptions of the Chalk in Great Britain, and indicates the general distribution of the beds. Chap. 1 treats of the Hampshire Basin, the first sections being severally occupied with its E., N., W., and S. divisions. The second part of this chapter gives an account of the earth-movements, both contemporaneous with and subsequent to the deposition of the Cretaceous beds, the lines of elevation being also compared with those of the Paris Basin. Chap. 2 refers to the London Basin; a detailed description of the beds is given, and the causes of the variations in their thickness are discussed. Chap. 3 describes the Chalk of Lincolnshire and Yorkshire, and compares it with that of the N.W. of Germany. Chap. 4 treats of the Irish Chalk, in which are found representatives of all the Cenomanian, Turonian, and Senonian zones. A tabular view of the zones identified in the different districts concludes the memoir. A. J. J-B.

——. L'Age des "Folkestone Beds" du Lower Greensand. [Age of the Folkestone Beds.] *Ann. Soc. Géol. Nord*, t. iii. pp. 23–25.

Points out that both the Folkestone Beds and the Sandgate Beds are represented at Wissant, and identifies the *Ammonites mammillaris* zone of the former with the zone bearing the same name in the Paris Basin. This the author regards as belonging to the Gault, and suggests that, as there is a strongly marked line at the base of the English Folkestone Beds, the whole of them may be synchronous with the French *Amm. mammillaris* zone, and should therefore be classed with the Gault. A. J. J-B.

——. La dénudation des Wealds et le Pas-de-Calais. [Denudation of the Weald and the Straits of Dover.] *Ann. Soc. Géol. Nord*, t. iii. pp. 75–84.

Thinks that the existence of a plain of marine denudation is assumed, not proved. It is likewise not proved that either the London Clay sea, the *Calcaire Grossier* sea, or the Pliocene sea covered the district. By studying the surrounding Cretaceous escarpments an explanation of the denudation of the Weald not requiring any of these hypotheses is arrived at. Concludes that the rivers there run in synclinals or in anticlinals when these are broken. The folds of the Chalk have thus determined the course of the Wealden rivers, whether there was a plain of marine denudation or not. The Straits of Dover are due primarily to a set of fractures and folds which affected the Weald towards the end of the Eocene period. G. A. L.

Barrois, Dr. Ch. Note sur la zône à *Pecten asper* (tourtia) en Angleterre. [*Pecten asper* zone in England.] *Ann. Soc. Géol. Nord*, t. iii. p. 92.

——. L'âge de la pierre de Totternhoe. [Age of the Totternhoe Stone.] *Ann. Soc. Géol. Nord*, t. iii. pp. 145–149.

Notices the errors made regarding its stratigraphical position, and that Mr. Whitaker had shown it to overlie the U. Greensand. States that the highest beds now seen in the quarries represent the zone of *Ammonites Rotomagensis* (about 30 feet), that the next 30 feet are the equivalents of the *Amm. varians* zone, and below these come the Totternhoe Beds, which consequently belong to the horizon of *Plocoscyphia mæandrina*. At the base of all he finds the equivalent of the Chloritic Marl. A. J. J-B.

Belt, Thomas. The Drift of Devon and Cornwall, its Origin, Correlation with that of the South-east of England, and Place in the Glacial Series. *Quart. Journ. Geol. Soc.* vol. xxxii. pp. 80–90; woodcut.

S. of a line from the Thames past Cirencester to the Severn at the mouth of the Avon there are no glaciated rock-surfaces, till, or moraines. The superficial beds may be divided into *upland deposits*, containing travelled boulders, covering the highlands, and *lowland deposits* filling up the valley-bottoms. These deposits contain no marine shells; they are separated from each other by driftless slopes. The first stage of the glacial period was the withdrawal of much water from the sea to form ice, which was piled up at the Poles, leaving the beds of the English Channel and German Ocean dry: over this surface Palæolithic man and the great Mammalia passed; the Germanic River flowed from the area now covered by the German Ocean. The ice advanced from the N. across the Atlantic, finally blocking up the English Channel and the drainage of N. Europe, forming a vast lake, on which floated icebergs from the N. When this icy barrier gave way the waters were suddenly let loose; the lowland gravels of the S. of England and the middle sands and gravels of the Eastern Counties were spread out. The glacier again advanced, and the U. Boulder Clay of Norfolk and Suffolk was formed. The ice retired northwards; but the sea had not yet returned to its former level; the British Islands were still joined to the continent, allowing the immigration of Neolithic man and the existing fauna. W. T.

——. On the Geological Age of the Deposits containing Flint Implements, at Hoxne...., and the Relation that Palæolithic Man bore to the Glacial Period. *Quart. Journ. Sci.* n. s. vol. vi. pp. 289–304.

Describes the deposits, urging that they are continuous with the Middle Glacial beds, instead of occupying a hollow scooped in the U. Boulder Clay, as has been thought. W. H. D.

Bennie, James. Note on the Range of *Saccamina Carteri*, Brady, in the Carboniferous Series. *Geol. Mag.* dec. ii. vol. iii. p. 47.

Refers to a paper by Mr. Lebour (see GEOLOGICAL RECORD for 1875, p. 28), and states that *Saccamina Carteri* occurs in several places in Midlothian, in the Calciferous Sandstone Series in Haddingtonshire, and in the lowest Carboniferous beds in Lanarkshire. In 1865 Mr. Salter recorded this fossil as a Foraminifer from Dunbar. W. T.

Bevan, G. P. Handbook to the County of Kent. *London.*

Notices the geology.

Bird, Charles. On the Red Beds at the base of the Carboniferous Limestone in the N.W. of England. *Proc. Geol. Soc. W. Riding Yorksh.* n. s. pt. ii. pp. 57–66, pls. ii., iii.

Describes the red beds of Kirkby Lonsdale, Sedbergh, Kendal, Tebay, Penrith, and the Isle of Man. Regards them as basement beds to the Carboniferous Limestone. W. H. D.

Blake, Rev. J. F. Lower Silurian Foraminifera. *Geol. Mag.* dec. ii. vol. iii. pp. 134, 135.

Records the occurrence of Dentalian Foraminifera in Caradoc shales 8 miles E. of Aberystwith.

Bonney, Rev. T. G. The Age of the Rocks of Charnwood Forest. *Nature*, vol. xv. pp. 97, 137.

Remarks on the close resemblance between the beds of coarse volcanic agglomerate and ash of the Charnwood series to the Green Slate and Porphyry series (or Borrowdale Rocks) of the Lake District, and refers their probable age to the period of volcanic activity that produced the Lake District and Cader Idris rocks, and not to the L. Cambrian, in which there is no evidence of volcanic energy. C. E. D.

Boulger, G. S. The First Irish Cave Exploration. *Proc. Geol. Assoc.* vol. iv. no. 8, pp. 524–526.

Notes on the Physical Geography of the S. of Ireland and the Caves of Co. Waterford.

——. Note on Mammals of the Thames Valley found at Greenwich. *Proc. W. Lond. Sci. Assoc.* vol. i. pt. ii. p. 47.

5 or 6 species found in coarse gravel near the river.

Bristow, H. W. Table of British Sedimentary and Fossiliferous Strata. Ed. 2. *London.*

Brodie, Rev. P. B. On the further Extension of the Rhætic or Penarth Beds in Warwickshire, Leicestershire, Nottinghamshire, Yorkshire, and Cumberland; and on the Occurrence of some supposed Remains of a new Labyrinthodont and a new Radiate therein. *Rep. Brit. Assoc.* for 1875, *Sections*, p. 64. (See GEOLOGICAL RECORD for 1874, p. 6.)

The fossils referred to occurred near Leicester.

Brodie, W. R. Notes on the Kimmeridge Clay of the Isle of Purbeck. (Abstract.) *Proc. Geol. Assoc.* vol. iv. no. 8, pp. 517, 518.
Notes the beds and a few of the fossils as observed at some localities.

Buckland, A. W. Wintry Days in Devonshire. *Evening Hours*, p. 698.
Refers to the Budleigh-Salterton pebble-bed, recent submersion, extinct mammalia, and palæolithic implements. (Notice in *Trans. Devon. Assoc.* 1877, p. 440.)

Champernowne, A. Devonian and Old Red Sandstone. *Geol. Mag.* dec. ii. vol. iii. pp. 575, 576.
The "Upper South Devon Slates" are a fiction.

Cheadle, R. W. On Mammalian Bones recently found at Crayford and Erith. *Proc. W. Lond. Sci. Assoc.* vol. i. pt. ii. pp. 70, 71.
Section and list of 6 Pleistocene mammals from Erith, including a *Spermophilus* (3 bones). List of 4 species from Crayford.

——. On a Tusk of Mammoth found at Erith, May 6, 1876. *Proc. W. Lond. Sci. Assoc.* vol. i. pt. ii. p. 79.
Notes horizon, mode of extraction, &c. of a tusk of *Elephas primigenius*, $6\frac{1}{4}$ feet long, giving measurements.

Cheadle, R. W., and B. B. Woodward. Notes on the Pleistocene Deposits at Crayford and Erith. *Proc. W. Lond. Sci. Assoc.* vol. i. pt. iii. pp. 92–98.
Summarize the literature of these beds, figuring two worked flints found in place in them, and giving a list of 39 species of Mollusca, 5 of which were not previously recorded from these localities. W. H. D.

——, ——. Excursion to Lewisham. *Proc. W. Lond. Sci. Assoc.* vol. i. pt. iii. pp. 111, 112.
Describe a fault in a railway-cutting, and the three pits on Loam Pit Hill, which show the entire series from the Chalk to the London Clay. W. H. D.

Clark, T. Notes on three sections of the Lead Districts in Cornwall, showing the productive and unproductive Rocks. *43rd Ann. Rep. R. Cornwall Pol. Soc.* for 1875, pp. 131, 132; plate; *Rep. Miners' Assoc. Cornwall* for 1875, p. 68.
These lead-lodes are productive while they traverse a soft light-greyish-yellow or greyish-blue killas, but become unproductive in hard dark-blue killas. C. L. F.

Clarke, Edward. On a Radius of Rhinoceros found in Hammersmith Marshes. *Proc. W. Lond. Sci. Assoc.* vol. i. pt. iii. pp. 98, 99, 111.
Note of section and discovery of *R. tichorhinus*?

Clough, C. T The Section at the High Force, Teesdale. *Quart. Journ. Geol. Soc.* vol. xxxii. pp. 466–471; 2 woodcuts.

This section has been supposed to show but one bed of basalt. An underlying bed, described by Prof. Phillips as subprismatic plate (or shale), is shown by the author to be a fine-grained basalt. Below the High Force both beds of basalt come together. The lower bed is an "underflow" from the Great Whin Sill, which is thus proved to be intrusive. W. T.

Clutterbuck, Rev. J. C. The Geology and Water-Supply of the neighbourhood of Watford. *Trans. Watford Nat. Hist. Soc.* vol. i. pt. v. pp. 125–131. Discussion, pp. xxxvi, xxxvii (1877).

General sketch of the geology (Chalk, Lower London Tertiaries, London Clay, and Gravel); the water-passages in the Chalk, the effects of rainfall, flooding, and drought, and the fouling of well-water by percolation from turbid rivers. W. H. D.

Collins, J. H. On Pawton Iron Mine. *Rep. Miners' Assoc. Cornwall* for 1875, pp. 26–30; woodcut.

Red hæmatite and a little spathic iron ore occur in a true fissure-lode in the killas, bearing N. 18° W. The author supposes that the contents of the vein may have been derived from the enclosing rocks. C. L. F.

Coutts, James. On the Post-tertiary Clay-beds at Houston. *Proc. Nat. Hist. Soc. Glasg.* vol. ii. part 2, pp. 336–342.

Describes the glacial beds of the Clyde district and the mode of their formation, giving a list of 56 species of Mollusca, &c. W. H. D.

Craig, Robert. On a bed of Dolerite that crosses Renfrewshire to the East of Paisley. *Coll. Guard.* vol. xxxi. p. 102.

Very full abstract of paper read to Geol. Soc. Glasgow.

Crofton, Rev. Addison. Drift, Peat, &c. of Heysham, Morecambe Bay. *Trans. Manch. Geol. Soc.* vol. xiv. pt. vii. pp. 152–154.

Cliffs of red clay, with stones marked with ice-scratches and derived from the Lake District, are described. Shells of *Mya truncata* and *M. arenaria* occur in the clay, resting on which, in the low ground, is a bed of peat with antlers of red deer lying on grey clay; the peat is being rapidly denuded. C. E. R.

Crosskey, Rev. H. W. Third Report of the Committee appointed for the purpose of recording the positions, height above sea, lithological characters, size, and origin of the more important of the Erratic Blocks of England and Wales, reporting other matters of interest connected with the same, and taking measures for their preservation. *Rep. Brit. Assoc.* for 1875, pp. 82–91.

Information is given regarding Boulders in Devonshire (Waddeton

and Englebourne), by **W. Pengelly**; near Buntingford in Herts, by **R. P. Greg**; South Notts, by **Rev. A. Irving**; Leicestershire, by **J. Plant**; Lancashire, by **G. H. Morton**; Worcestershire and Yorkshire.
W. T.

Dairon, James. Notes on the Silurian Rocks of Dumfriesshire. *Coll. Guard.* vol. xxxi. p. 662.
Nearly full report of paper read to Geol. Soc. Glasgow.

Dalton, W. H. Subsidence in East Essex. *Geol. Mag.* dec. ii. vol. iii. pp. 491–493.
Gives evidence that the coast is subsiding or has been so within quite recent periods. Fowlness, however, has been stationary since the Norman Conquest. W. T.

Danby, T. W. Elevation and Subsidence of Land in Jersey. *Geol. Mag.* dec. ii. vol. iii. pp. 143, 144.
Notes raised beaches and inland caves in Jersey and Sark.

Davies, D. C. On Some of the Causes which have Helped to Shape the Land on the North Wales Border. *Proc. Geol. Assoc.* vol. iv. no. 6, pp. 340–352; 17 woodcuts.
The district referred to is that seen from the high land about Ifton and St. Martin's, in the N.W. corner of Shropshire. The results of subterranean movements in bending and breaking rocks are described; the influence of these movements, in conjunction with denudation, in shaping hills and valleys is illustrated by examples classed as follows:—Valleys of Upheaval, Depression, and Erosion; Valley eroded at foot of Escarpment; Valley along a line of Fault; Valley in Trough between two Faults; Valley of Erosion in soft strata, bounded on either side by hard; small Faults; Escarpments. The denuding agencies are next described. Great effect is given to the sea in the excavation and widening of valleys; the denuding effect of an ice-cap is denied; Ice (as glaciers), streams, and atmospheric water are powerful agents; but atmospheric waste tends to check its own progress and to diminish its own power. W. T.

——. On the Drift of the North Wales Border. *Proc. Geol. Assoc.* vol. iv. no. 7, pp. 423–439, pl. v. (sections).
The Drift is thickest between Oswestry and Wrexham; but there are thick deposits in hollows and valleys of the hilly country further W. The *Pre-Glacial Drifts* (of local origin) occur only in hollows of the Carboniferous Limestone. The *Glacial Drifts* are grouped into U. and L. Boulder Clay, and Middle Sands and Gravels. Both Boulder Clays contain local and northern stones, but no fragments drifted from the E.; the Scotch granites do not pass S. of Oswestry. The Middle Sands are well stratified. In none of these deposits have contemporaneous fossils been found. The *Post-Glacial Drifts* are redistributed gravels and clays with marine shells; without great care these beds may be mis-

taken for the true glacial beds. The more recent deposits are Brick-clay, Freshwater Shell-beds, and Peat. During the period embraced by the glacial deposits the highlands of N. Wales were above water; glaciers descended from thence, and the local material thus brought into the sea was mixed with that brought by ice from more northern regions. The paper concludes with a short bibliographical list. W. T.

Davies, D. C. Excursion to the North Wales Border. *Proc. Geol. Assoc.* vol. iv. no. 9, pp. 559–568.

Cyrnybwch, near Oswestry; Pontfaen, near Chirk, and the Glyn Valley Tramway to Pontdolwern; Dolcoch; Llanderfel; Berwyn Hills and the Phosphate Mines; Trevor and Llangollen. Descriptions of the districts were given by **Prof. J. Morris, Prof. Hughes, Dr. Hicks,** and others. W. T.

Davis, J. W. Erratic Boulders in the Valley of the Calder. *Proc. Geol. Soc. W. Riding Yorksh.* n. s. pt. ii. pp. 93–100.

Beds with non-local boulders in the bottom of the valley, from Hebden Bridge to Wakefield, are attributed to postglacial submersion.

Dawkins, Prof. W. B. On the Mammalia and Traces of Man found in the Robin-Hood Cave. *Quart. Journ. Geol. Soc.* vol. xxxii. pp. 245–258; 11 woodcuts of implements.

The cave was inhabited by hyænas during the deposition of the lower and middle deposits (see **Mello**, p. 25). The other animals found were introduced by the hyæna. The cave was visited by man during the deposition of the cave-earth, and was inhabited by him during the breccia-period, when it was rarely visited by hyænas. A list is given of the animals found. The implements of the cave-earth are chiefly of quartzite and rude in form; those of the breccia are chiefly of flint and of better manufacture. There is no evidence of the relation of the deposits in this cavern to the Boulder Clay. W. T.

——. Caves. *Encycl. Britann.* ed. 9, vol. v.

Day, St. John V. The Iron and Steel Industries of Scotland. In 'Notices of some of the Principal Manufactures of the West of Scotland.' 8vo. *Glasgow.* Pp. 60.

Part I. Preliminary observations (pp. 1–14), gives analyses of Ores, Coals, and Limestones. Part II. The Carboniferous System of Scotland (pp. 15–29) gives a sketch of the formation, stratigraphical details regarding the ores and coals, and further analyses. W. T.

Deas, James. The River Clyde; an Historical Description of the Rise and Progress of the Harbour of Glasgow. Maps and sections. *Glasgow.* From notice in *Nature,* vol. xv. p. 99.

Improvements in the bed of the Clyde have reduced low-water level in Glasgow Harbour 8 feet since 1758. In widening the side, and excavating docks, many boulders, some weighing 6 tons, have to be removed from the Boulder-clay by means of diving-bells. C. E. D.

De Rance, C. E. First Report of the Committee for investigating the circulation of the Underground Waters in the New Red Sandstone and Permian Formations of England, and the quantity and character of the water supplied to various towns and districts from these formations. *Rep. Brit. Assoc.* for 1875, pp. 114–141.

Gives tables of succession and thickness of strata in the Liverpool and Preston district and in the Leeds and York district. Details of well-sections (in Devonshire, Somersetshire, Gloucestershire, Leicestershire, Warwickshire, Lancashire, Cheshire, and Yorkshire) and analyses of water are also given. W. T.

——. S. Lancashire and Burnley Coal Fields. *Trans. Manch. Geol. Soc.* vol. xiv. pt. vi. p. 143.

Describes variations in thickness of the Coal Measures and seams.

Dickinson, Joseph. '*Stigmaria ficoides*' in the Coal of Leinster, Ireland. *Trans. Manch. Geol. Soc.* vol. xiv. pt. ii. pp. 27, 28.

Describes rootlets in the under clays of the anthracite coal-seams.

Dove, George, jun. The Frodingham Iron Field, North Lincolnshire. *Journ. Iron Steel Inst.* pp. 318–341 (with discussion); 2 plans.

Contains a table of analyses showing the composition of the bed to be very variable. Analyses of the Manganiferous bands, Lincoln Stone, and Santon Clay are also given. R. B. N.

Duncan, Major F. The Bagshot Sands in the Isle of Sheppey. (Abstract.) *Proc. Geol. Assoc.* vol. iv. no. 9, pp. 568, 569.

The sands occur at Minster. The junction with the London Clay is sharp, from which (and the absence of fossils) the author suggests that the sands may be of sub-aërial origin. W. T.

Etheridge, R., jun. Note on the Fossils from the Glacial Deposits of the North-west Coast of the Island of Lewis, Outer Hebrides [with a Note by **Dr. J. Geikie**]. *Geol. Mag.* dec. ii. vol. iii. pp. 552–555.

The fossils were described from two localities on the N.W. coast, a little S.W. of the Butt. In all there are 22 species, 16 of which also occur in the Boulder Clay of Caithness. Dr. Geikie's note refers to the succession of events in the glaciation of the district. W. T.

——. Further Localities for *Acanthospongia Smithii*, Young, and *Estheria Dawsoni*, Jones. *Geol. Mag.* dec. ii. vol. iii. p. 576.

3 localities for the first, in Scotch Lower Carboniferous Sandstone; 1 locality for the last, in Lower Calciferous Sandstone, Dunbar.

Fordham, H. G. On the Section of the Chloritic Marl and Upper Greensand on the Northern Side of Swanage Bay, Dorset. *Proc. Geol. Assoc.* vol. iv. no. 8, pp. 506–516; woodcut.

The beds are Grey Chalk 103 ft., Chalk Marl? 40 ft., Chloritic Marl 4 ft., U. Greensand 70 ft., Gault. There is a slight break between the Chloritic Marl and the U. Greensand. Lists of fossils are given. W. T.

Foster, Dr. C. Le N. Remarks upon the Tin Deposits of East Wheal Lovell. *Trans. R. Geol. Soc. Cornwall*, vol. ix. pt. ii. pp. 167–176; 4 plates. *Berg- hütt. Zeitung*, vol. xxxv. pp. 417, 418.

The rich stanniferous *pipes* and *bunches* of East Wheal Lovell are considered to be granite altered by vapours or solutions ascending through very narrow fissures into an aggregate of quartz, mica, cassiterite and gilbertite, with some fluor-spar, copper-pyrites, copper-glance, and chalybite. C. L. F.

——. On a Deposit of Tin at Park of Mines, St. Colomb, Cornwall. *Rep. Miners' Assoc. Cornwall* for 1875, pp. 22–26; 5 woodcuts; and *Rep. Brit. Assoc.* for 1875, *Sections*, p. 64.

The tin-ore occurs as lenticular layers, generally an inch or 2 inches thick, between the planes of bedding of the Killas. The layers appear to be the offshoots from N. and S. veins. W. T.

Geikie, Prof. A. History of the Deposits known as the Old Red Sandstone. *Nature*, vol. xiii. pp. 389–391; and *Coll. Guard.* vol. xxxi. pp. 344, 345.

Abstract of a paper read at Geol. Soc. Glasgow.

Geikie, Dr. James. The Cheviot Hills. *Good Words*, vol. xvii. pp. 11–15, 82–86, 264–270, 331–337; woodcuts.

Describes the scenery and extent of the region. The Scottish side is the most abrupt. The age of the igneous rocks, forming the greater part of the range, is intermediate between that of the greywacke beds and of the red and white sandstones (Upper Old Red Conglomerate or lowest Carboniferous) lying unconformably upon them. These igneous rocks consist chiefly of porphyrites. At Hindhope the oldest of them (the Ash beds) are to be seen. The early volcanic outbursts were submarine; but those at the close of the period of activity were subaërial. In early Carboniferous times there followed another volcanic period, to which the plugged-up vents of Ruben Land, Black Land, &c. belong. Describes the glacial deposits fully. The Cheviots were covered by the ice-sheet when at its thickest; but they divided the flow between Scotland and England. F. J. B.

Green, Prof. A. H. Notes on Variations in Character and Thickness of the Millstone-grit of North Derbyshire and the adjoining parts of Yorkshire, and on the probable manner in which these Changes have been produced. *Rep. Brit. Assoc.* for 1875, *Sections*, p. 65.

The Millstone-grit of the district treated of was described in 3 sub-

divisions. The highest is singularly constant in character and thickness; the lowest varies a good deal; the middle division is very changeable, its beds thin out and replace each other. The author supposes the floor on which these deposits were laid down to have been uneven, and that the grit filled up the hollows. W. T.

Green, Prof. A. H. On the Variations in Thickness and Character of the Silkstone and Barnsley Coal Seams in the Southern Part of the Yorkshire Coal-field, and the Probable Manner in which these and similar Changes have been produced. *Proc. Geol. Soc. W. Riding Yorksh.* n. s. part ii. pp. 68–77, pl. iv.; and *Trans. N. Engl. Inst. Eng.* vol. xxv. p. 13.

Details of changes in these seams between Sheffield and Wakefield.

——. On the Geology of the Central Portion of the Yorkshire Coal-field lying between Pontefract and Bolton-on-Dearne. *Proc. Geol. Soc. W. Riding Yorksh.* n. s. part ii. pp. 108–112, pl. vi. (map).

Stratigraphical details as indicated by two leading sandstone beds, the Pontefract or Houghton Common Rock and the Brierley or Ackworth Rock. W. H. D.

——. Notes on the Yorkshire Coal Field. *Journ. Iron Steel Inst.* pp. 305–317 (with discussion).

Notices the seams in the following order:—Ganister, with analysis by **J. W. Westmoreland**; Elland Flag Rock; Low Moor Measures (general section); Black Bed Coal; Ironstone Measures (in a band of carbonaceous shale), with section showing thicknesses; Beeston Bed Coal; Middleton Main (section); Haigh Moor Coal; Swallow Wood Coal; Silkstone; Barnsley, with analyses from "Third Report on Coal suited to the Steam Navy;" Blocking Coal; Barcelona Coal; Gawthorpe Coal; Warren House Coal. Thinks that this coal-field, hitherto so little worked, will in the future give large supplies. R. B. N.

——. The Age of the Rocks of Charnwood Forest. *Nature*, vol. xv. p. 97.

Comments on the likeness of the sheet of crystalline rock and beds of highly altered conglomerate and breccia of Charnwood to the lava-flows &c. of the Lake District. States that sections show that the bosses of dioritic rock near Markfield were older than the slates surrounding them, and suggests the possibility of the bosses being the projecting points of an underlying nucleus of Laurentian rocks, which need not be composed of gneiss, as are those of the Hebrides. C. E. D.

Grimshaw, W. J. On the Method of Working "Rearing Mines" at Leycett, Staffordshire. *Trans. Manch. Geol. Soc.* vol. xiv. part vii. pp. 155–168.

Leycett Collieries are 4 miles W. of Newcastle-under-Lyne, and W. of the great Staffordshire Fault and of the Apedale Hall "saddle." E. of this the dip is small; W. of it very variable and often steep. When the coal dips 30° or more it is a "rearing mine." C. E. D.

Guise, Sir W. V. Annual Address, 1875. *Proc. Cotteswold Club*, vol. vi. pp. 127–143.

Refers to a communication by Mr. Etheridge on the Cambrian Beds of St. David's (p. 129). Contains notes on the field-meetings, with remarks by the **Rev. W. S. Symonds** on Permian and Triassic beds, and on the Newent Coal-field (pp. 131–133); by **Mr. C. Moore** on the Lias and Rhætic beds of Weston, near Bath (p. 134); by **Dr. Wright** on the genesis of the Oolites (pp. 135–138); by **Mr. J. McMurtrie** on the Somerset and Gloucestershire Coal-fields (p. 140); notes on the Sponge-gravel beds of Faringdon (pp. 141–143).

——. Annual Address, 1876. *Proc. Cotteswold Club*, vol. vi. pp. 268–278.

Contains notes on the field-meetings; mentions the discovery of *Ophiolepis Damesii* in the Rhætic Beds at Garden Cliff (p. 271); notes on the Buckstone, near Monmouth (p. 273); remarks by the **Rev. W. S. Symonds** on Permian and Triassic rocks of Pendock (pp. 274, 275); notes on the borings in the Severn near Portskewel, and record of section (pp. 275–277). H. B. W.

Gunn, John. On the presence of the Forest-Bed Series at Kessingland and Pakefield, in Suffolk, and its position beneath the Chillesford Clay. *Quart. Journ. Geol. Soc.* vol. xxxii. pp. 123–128; woodcut section.

The beds described are in ascending order:—Elephant-bed and blue clay (estuarine) soil of the Forest-bed; Forest-bed, with roots of trees; "Rootlet-bed" and *Unio*-bed (freshwater); Fluvio-marine bed—*Norwich Crag*; Chillesford Clay and Sand (Marine); Pebbly Bed (or Westleton Sands) and Middle Drift; Upper Boulder-clay. The rootlet-bed has been regarded as the Forest-bed; but the author thinks the supposed rootlets only represent brushwood, which succeeded the true forest. W. T.

——. The Coal Prospects of Norfolk. *Eastern Daily Press*, Oct. 4.

Gives an account of a boring for coal at Scarle, near Newark, on the authority of Mr. J. T. Boot, and discusses its bearing on the probability of finding coal beneath the Secondary rocks of Norfolk. H. B. W.

——. Norwich Geological Society. Address of the President, November 7. Reprinted from the *Norwich Mercury*, Nov. 11.

Notices the various papers read during the Session 1875–76. Refers to the discovery of *Tellina Balthica* in the soil of the Forest-bed between Overstrand and West Runton, of the rootlet-bed at Happisburgh, and of palæolithic implements at Brandon. H. B. W.

Hall, Townshend M. Geology and Mineralogy [of North Devon]. (North-Devon Guide, part 3, and separately). Pp. 11. 12mo. *Ilfracombe.*

A sketch of the geology, with lists of fossils and minerals.

Hardman, Edward T. On the Age and Mode of Formation of Lough Neagh, Ireland; with Notes on the Physical Geography and Geology of the surrounding Country. *Journ. R. Geol. Soc. Ireland*, ser. 2, vol. iv. pt. 3, pp. 170–199; 3 plates.

The full report of the paper noticed in the GEOLOGICAL RECORD for 1875, p. 17. An appendix is added on fossiliferous Pliocene Clays overlying Basalt (see below).

——. Fossiliferous Pliocene Clays overlying Basalt, near the Shore of Lough Neagh. *Geol. Mag.* dec. ii. vol. iii. pp. 556–558, pl. xxii.

Describes and figures a section proving his views as to the age of the clays to be correct. The only fossils resemble *Unio*, ? n. sp. (*Mytilus* or *Modiola*, Ed. *Geol. Mag.*). W. H. D.

Harrison, W. J. On the Occurrence of the Rhætic Beds in Leicestershire. *Quart. Journ. Geol. Soc.* vol. xxxii. pp. 212–218; 2 sections; *Rep. Brit. Assoc.* for 1875, *Sections*, pp. 66, 67.

The sections are at Spinney Hills and at Crown Hill; at the latter place the beds are capped by Lower Lias. About 30 feet of Rhætic Beds are seen, particulars of which are given, with notes on the fossils; amongst these are *Ophiolepis Damesii* and a new species of *Pholidophorus* (*P. Mottiana*). Notes traces of the Rhætics in other localities in the neighbourhood. W. T.

——. Practical Geology in the Town of Leicester. *Spencer's Illustrated Leicester Almanack, &c.* for 1877, pp. 32–35.

Describes the various rocks, &c. used in the town.

——. Notes on the Geology of the North Midland Counties. *Kelly's Post-Office Directory for Notts, Derby, Leicester, and Rutland.* 4to. *London.*

Gives a detailed sketch of the geology of each of the above-mentioned counties.

——. Notes on the Geology of Lincoln, Warwick, Worcester, and Staffordshire. *Kelly's Post-Office Directory.* 4to. *London.*

——. The Age of the Rocks of Charnwood Forest. *Nature*, vol. xv. p. 97.

Refers these rocks to the Silurian epoch. C. E. R.

Haughton, Rev. Samuel. On the Trap Dykes that penetrate the Granites, Metamorphic Slates, and Carboniferous Limestones of the District of Mourne, in the North-east of Ireland. *Journ. R. Geol. Soc. Ireland*, ser. 2, vol. iv. pt. iii. pp. 91–104; woodcuts.

The district contains Mourne granite and Carlingford granite: the age of the former is unknown; but the latter is post-Carboniferous. The basic igneous rocks are:—anorthite-augite syenite passing into augite-rock; crystalline massive greenstone; fine-grained trap rocks: the first is older than the Carlingford granite. The granitic districts are the

Mourne Mountains, the Slieve Croob and Slieve Gullion region, and the Carlingford division. On the N. and E. are Silurian slates highly altered where in contact with the granite; on the S. the granites are surrounded by Carboniferous Limestone; and the whole district is freely penetrated by trap-dykes. The anorthite-syenite resembles the hypersthene-syenite of Skye, except in the lime-felspar being anorthite, not labradorite; and the author considers that it and the granite of the same district are practically contemporaneous, as each sends veins into the other, and that some of the syenites may be altered granites. Granite in a pasty condition coming in contact with a mass of limestone, and some peroxide of iron, would be fluxed into a syenite like that of Carlingford Mountain.

The mineralogical compositions of igneous rocks may be mathematically determined according to the *Law of Least Paste* (an application of the Law of Least Action), the same having been adopted in the elucidation of the mineral percentages of the lavas of Vesuvius (see *post*, Petrology); and an example is given of the syenite of Grange Irish, Carlingford. 18 analyses of the trap-rocks and syenites are given.

E. T. H.

Heathcote, J. M. Reminiscences of Fen and Mere. 8vo. *London.*

Notices the geology of the Fens.

Hicks, Henry. The Oldest Fossiliferous Rocks of Northern Europe. *Geol. Mag.* dec. ii. vol. iii. pp. 240, 379, 380.

Insists on the depression of the British before the Swedish area in Cambrian and Silurian times, and on the difference of the Harlech and Menevian faunas.

Tabulates the Welsh Cambrian Series, correlating the Swedish Paradoxides Schists with the Menevian. W. H. D.

——. Llandovery Rocks in the Lake-District. *Geol. Mag.* dec. ii. vol. iii. pp. 335, 336, 429, 430.

The Coniston Mudstones, Flags, and Grits=U. and L. Llandovery=Tarannon Shales and Denbighshire Grit. Oscillations and denudation during deposition produced the unconformities.

The Coniston Mudstone fossils are mostly U. Bala and L. Llandovery. The Tarannon Shales=L. Llandovery: they had no known fauna when mapped by the Geological Survey. W. H. D.

——. On some Areas where the Cambrian and Silurian Rocks occur as Conformable Series. *Rep. Brit. Assoc.* for 1875, *Sections*, p. 69.

The succession is complete and unbroken in Pembrokeshire, near Llandovery, in parts of Shropshire, and probably near Corwen. These areas received deposits uninterruptedly from the commencement of the Cambrian to the close of the Silurian. W. T.

——. On "Dimetian and Pebidian" Beds. *Land and Water*, vol. xxii. no. 570, p. 465.

States that these are sedimentary rock older than the Cambrians of

Wales; they occur in the neighbourhood of St. David's. The Cambrians lie unconformably on them; they are called after the old name of the Welsh kingdom and the name of the Hundred. (Paper read at the St. David's Geol. Society.)

Hobkirk, C. P. The Alleged Submerged Forest near Holmfirth. *Naturalist*, ser. 2, vol. i. pp. 138–141.

Quotes from Mr. Plant (see p. 30) a description of this buried peat-bed, correcting his statement as to the underlying shale (which is in Millstone Grit, not Coal Measures), denying the soundness of the heart-wood of the forest-trees, and doubting the occurrence of a lake after the peat-deposit, as rain-wash could form the overlying clay. The date is probably pre-Roman. **Mr. J. Tindall** adds a note on the number of trees and hazel-nuts, many of the latter being perforated, as if by the nut-hatch. W. H. D.

Hopkinson, J. Excursion to Hatfield. *Proc. Geol. Assoc.* vol. iv. no. 8, pp. 518, 519.

Horne, John. The Glaciation of the Shetland Isles. *Nature*, vol. xv. p. 139.

Thinks that the striæ of these isles are due to the united Scotch and Scandinavian ice-sheets.

——. Notes on the Geology (pp. 65–67) of "The Parish of Glencairn, Dumfriess-shire," by the Rev. J. Monteith. 8vo. *Glasgow.*

Howard, Thomas. On the River Avon (Bristol); its Drainage Area, Tidal Phenomena, and Dock Works. *Rep. Brit. Assoc.* for 1875, pp. 175–184, pl. vii.

The Avon carries more mud than any river in England, except the Humber. The tide-water contains, on an average, about $\frac{1}{3\,1\,6}$th part of mud. Analyses of alluvium and tidal mud, by **W. W. Stoddart**, are given. W. T.

Howchin, Rev. W. The Geology of Morpeth and its Neighbourhood. *Wilson's 'Handbook to Morpeth.'* Pp. 103–110. 8vo. *Morpeth.*

The rocks of the district are Carboniferous Limestone, Millstone Grit, and Coal Measures. Each division is described, also localities for fossils and the Drift beds. The pre-glacial course of the River Wansbeck was from Morpeth towards the S.E.; it now runs E. from that town, having cut a new and deep channel through the Coal Measure sandstones. The old river-terraces, the modern alluvial flats, and the evidence of recent atmospheric waste are pointed out.

[The author describes the occurrence of a *Leda* (supposed to be *L. lanceolata*) in Boulder Clay at Ashington; subsequently to the publication of this paper he proved it to be an included Carboniferous fossil.] W. T.

1876.

Hudleston, W. H. The Yorkshire Oolites. Part II. The Middle Oolites. Introduction and Section I. *Proc. Geol. Assoc.* vol. iv. no. 6, pp. 353–410, pl. iv. (map and sections).

Describes rocks from Cornbrash downwards, in the following order:—Shales, with *Avicula echinata*; Kelloway Rock; Oxford Clay; Lower Calcareous Grit. The following sections are more fully described:—Castle Yard and Hill, Scarboro' (Coralline Oolite to Kelloway Rock); Filey Brigg (Lower Calcareous Grit, with Lower and Upper Passage Beds). List of Fossils and notes on Mineral Composition are given, and the rocks are correlated with those of other districts. W. T.

——. Excursion to the Gorge of the Medway, and Kits Coty House. Excursion to Reading. Excursion to Swindon and Faringdon. *Proc. Geol. Assoc.* vol. iv. no. 8, pp. 503–505, 519–523; no. 9, pp. 543–554.

Notes the Gault and Chalk Marl of Aylesford; gives notes of a lecture by **Prof. J. Morris**, on the Denudation of the Weald. **Prof. T. R. Jones** described the "Bottom Bed" of the Tertiaries and its junction with the Chalk, the clay-galls of the sand, &c.

Mr. C. Moore and **Prof. J. Morris** described the Purbeck, Portland, and Upper Kimmeridge Clay of Swindon; **Mr. C. J. A. Meyer, Mr. E. C. Davey,** and **Prof. Morris** the Sponge-gravels (L. Greensand) and Corallian Limestones of Faringdon. W. T.

Hughes, Prof. T. McK. Notes on the Classification of the Sedimentary Rocks. *Rep. Brit. Assoc.* for 1875, *Sections*, pp. 70–73.

Advocates revision of the present classification, which is often inconsistent. The "Epochs" proposed are:—Laurentian, Labrador Series, Huronian (?), Cambrian, Silurian, Carboniferous, New Red, and Jurassic, with gaps between each. The rocks of Gt. Britain and Scandinavia older than Cambrian must be called simply "pre-Cambrian," there not being evidence to identify them with any of the American groups. Except in connexion with volcanic deposits, no break has been proved between the base of the Harlech group and the top of the Bala Series, all of which is Cambrian. The base of the Silurian is the base of the May-Hill Sandstone (L. Llandovery); a great part of the Old Red Sandstone of South Wales is taken in the Silurian. The term Permian is dropped, the rocks so called being restored to Sedgwick's division of Lower New Red. The most important gap in Britain (possibly with the exception of some of pre-Cambrian age) is that between the Silurian and Carboniferous; next to this comes that between the Carboniferous and New Red. Reference is made to Sedgwick's classification, which is defended against the alterations proposed by Murchison. W. T.

Hull, Prof. Edward. Notes on the Structure of Haulbowline Island, Cork Harbour; and on the Geological Age of the Flexures of the Strata in the S.W. of Ireland. *Journ. R. Geol. Soc. Ireland*, ser. 2, vol. iv. pt. iii. pp. 111–114.

Haulbowline, opposite the mouth of the river Lee, is composed of a

thick-bedded, much-jointed limestone. It lies close to a synclinal fold, the underlying Carboniferous slate appearing at the N. shore of the channel and at Spike Island. The limestone has undergone great changes subsequent to the flexures which affect it, the bedding being almost obliterated, as also to a great degree its organic structure; and the rock is crossed by many veins of calcite, often stained by iron-oxide, the alteration being effected by water charged with carbonic acid, to the action of which the physical circumstances of the beds presented favourable conditions. The highly flexured beds are in parallel ridges and valleys trending nearly E. Of the period when the flexures were formed there is no evidence, there being no formation newer than Carboniferous; but, arguing from analogy, and by comparison with the districts of Somersetshire and S. Wales and of Lancashire and Yorkshire, the author concludes that the Carboniferous and Devonian rocks of the S. of England and Ireland were folded along the main line of flexures, so persistent immediately upon the close of the Carboniferous and before the Permian period. E. T. H.

Hull, Prof. Edward. The Age of the Rocks of Charnwood Forest. *Nature*, vol. xv. pp. 78, 116.

Refers the rocks of this area to the Cambrian of the Geological Survey, rather than to that of the Llandeilo or Caradoc beds.

——. The Scarle Boring, Lincolnshire. *Geol. Mag.* dec. ii. vol. iii. p. 95.

Begins in the L. Lias, and reaches Coal Measures at 1900 feet.

Irving, Rev. A. Some Recent Sections near Nottingham. *Quart. Journ. Geol. Soc.* vol. xxxii. pp. 513–515.

Refers to a paper by **E. Wilson** (see p. 40), to the age of the "Rotherham Rock," to the sections of Bunter and Keuper exposed in the railway cuttings, and to the faults of the district. W. T.

——. Report of Excursion to Grantham and Nottingham. *Proc. Geol. Assoc.* vol. iv. no. 8, pp. 491–497.

Describes sections of Lincolnshire Oolites in Great and Little Ponton railway cuttings, the relations of the New Red to the Permian as seen at Cinder Hill, Kimberley, &c. At Cinder Hill a fault throws the Coal Measures 60 yards more than it throws the overlying Permian. The notes are supplied by **Rev. A. Irving, W. H. Holloway, E. Wilson,** and **R. Fowler.** W. T.

Jack, R. L. The Geology of Glasgow and the Neighbourhood. *Sci. Goss.* no. 141, pp. 193–197.

Notices the canoes that have been dug up in the city; the striated rock-surfaces; the Boulder Clay and the stratified clay, with shells (interglacial); the Kaims; the basaltic dykes, one 40 miles long; the Coal Measures, with the black-band ironstone; the Millstone Grit, with fire-clay; the Carboniferous Limestone series, which here consists of a few beds of limestone in a mass of sedimentary beds, with coal and

ironstone; the volcanic lavas and ashes of Kilpatrick, &c.; the necks or plugged-up vents of old volcanoes; and the Calciferous Sandstone, lying unconformably on the Lower Old Red. All of these rocks occur within 20 miles of Glasgow, which stands in the centre of a basin. W. W.

Jenkinson, H. I. Practical Guide to the Isle of Wight. 8vo. *London.*

A chapter on the geology gives a summary of the characters of the various formations, with a "new theory" that the vertical and arched beds of Chalk and Lower Tertiaries were deposited in that position. W. H. D.

Jones, Prof. T. R. Note on an Annelid Bed in the Gault of Kent. *Geol. Mag.* dec. ii. vol. iii. pp. 117, 118.

Describes a hard band of clay, 2 inches thick, full of Annelids, near Charing, Kent.

——. The Sarsen Stones. *Geol. Mag.* dec. ii. vol. iii. p. 523.

At Avebury and Marlborough are Sarsen stones penetrated by vertical rootlet-holes and horizontal casts of stems, &c.

Jordan, Henry K. The Pencoed, Mynydd-y-Gaer, and Gilfach Goch Mineral Districts. *Proc. S. Wales Inst. Eng.* vol. ix. pp. 250–270, pls. 29–33 (map and sections).

Describes the coal-seams, faults, and flexures of the above districts, giving a list of minerals.

Kendall, J. D. Hæmatite in the Silurians. *Quart. Journ. Geol. Soc.* vol. xxxii. pp. 180–183; 4 woodcuts.

The Silurian beds at Millom, Cumberland (Water-Blean Mines), are *inverted*, the Coniston flags dipping under the Coniston Limestone. The hæmatite occurs along the beds of the limestone. W. T.

Kinahan, G. H. Irish Drift. Subgroup—Meteoric Drift. *Journ. R. Geol. Soc. Ireland*, ser. 2, vol. iv. pt. iii. pp. 115–121; 4 woodcuts.

Meteoric Drift may be formed by the actual weathering of some rocks into clays; also by the weathering of older Drifts, and the rearrangement of true Glacial Drift, for which it may be often mistaken. A sub-variety is the *Æolian Drift*: sand-dunes, blowing sands, &c., many sands and sandstones of supposed aqueous origin, may have been thus formed. E. T. H.

——. An Outlier of Glacialoid or Rearranged Glacial Drift on Stratified Gravel (Esker Period), Mourne Demesne, County Down. *Journ. R. Geol. Soc. Ireland*, ser. 2, vol. iv. pt. iii. pp. 122, 123; 4 woodcuts.

This Drift, which has been taken for Upper Boulder Clay, rests on gravels; but the conditions of the ground rather point to its being a rearranged Drift; and sketches showing how this might arise are given. E. T. H.

Kinahan, G. H. On the Rocks of the Ballymoney Series, Co. Wexford. *Trans. Manch. Geol. Soc.* vol. xiv. part vii. pp. 145–151.

Dislocated Cambrian rocks, more or less denuded and metamorphosed, are overlain unconformably by the Cambro-Silurians, consisting at the base of Caradoc and Llandeilo grits, shales, and slates, overlain by the Ballymoney Series; greenish shales and slates, seen half a mile N. of Courtown harbour, and limestones and ferruginous grits weathering into masses of ochre. C. E. D.

——. The Lagoons of the South-East Coast of Ireland. *Proc. Inst. Civ. Eng.* vol. xliv. pp. 204–218, pl. 7 (charts).

Describes the lagoons and the formation of the bars or banks of Æolian Drift that separate them from the open sea. States the reasons for the failures of the attempted intaking of some of the mud-lands, and gives suggestions how the defects might be remedied. W. T.

——. Holiday Rambles in the West of Ireland. The Plants and Rocks of Aran. *Sci. Goss.* no. 142, pp. 222, 223.

Most of the surface is bare limestone, with thin beds of shale and clay, causing springs. The sea on the W. side has thrown up large blocks of rock. There are also erratic blocks. W. W.

[——.] (**Nahanik.**) Geology of Irish Salmon Rivers—The Ovoca and its Tributaries. *Land and Water*, June 24.

Describes the river-basin, and shows that the courses of the different streams occupy the lines of old fissures along dislocations, as is common in S.E. Ireland; there is a short description of the rocks of the area and of the Drifts, including the auriferous sands of the tributaries of the Aughrim river. G. H. K.

——. [**G. H. K.**] Subwealden Exploration. *Land and Water*, Oct. 7, page 251.

Points out, and represents by a diagram, that the bore-hole may be in a gorge in the older rocks, filled with the newer rocks, and consequently a fictitious thickness of the newer rocks seems to exist, while if the bore-hole had been put down a few miles away their real thickness would appear. G. H. K.

Lapworth, Charles. Llandovery Rocks in the Lake District. *Geol. Mag.* dec. ii. vol. iii. pp. 477, 478.

Argues from the evidence of Graptolite groups that the Coniston Mudstones are of L. Llandovery age or older. Beds with Coniston Mudstone forms are classed as U. Llandeilo by the Scotch, and as Bala by the Irish Geological Surveys. W. H. D.

Latham, Richard. On the Sinking of the Lye Cross Pits from the summit of the Rowley Basaltic Hills. *Coll. Guard.* vol. xxxi. p. 182.

Read at Meeting of S. Staffordshire and E. Worcestershire Inst. of Mining Engineers.

Lavelley, —. Tunnel sous-marin entre la France et l'Angleterre. (Soc. Ing. Civ. Paris.) *Moniteur Industriel Belge*, Feb. 10 and 21, pp. 74–76, 90, 91.

A general description of the proposed tunnel, noting the characters of the rocks on the coasts, and giving an account of recent submarine surveys to determine the outcrop of the Chalk across the Channel.

W. T.

Lavis, H. J. J. On the Triassic Strata which are exposed in the Cliff-sections near Sidmouth, and a Note on the occurrence of an Ossiferous Zone containing Bones of a *Labyrinthodont*. *Quart. Journ. Geol. Soc.* vol. xxxii. pp. 274–277; 2 woodcut sections.

The cliffs are capped by Chalk and U. Greensand, beneath which comes the Triassic marl overlying sandstone. The "ossiferous zone" occurs near the top of the sandstone. Details of the cliff-section are given. W. T.

——. Notes on the Geology of Lewisham. *Proc. Geol. Assoc.* vol. iv. no. 9, pp. 528–543.

The beds described range from U. Chalk to London Clay. Comparative sections are given of the Lower Tertiaries of Charlton and Lewisham; also diagrams illustrating the corresponding conditions of deposit in the two districts. A list of minerals is appended. W. T.

Lebour, G. A. On the Larger Divisions of the Carboniferous System in Northumberland. *Trans. N. Engl. Inst. Eng.* vol. xxv. pp. 225–237, pl. 70.

The object is to propose certain changes in nomenclature. The definite boundaries adopted from the S. of England are objected to, especially in the case of the Millstone Grit, Gannister Beds, and Coal Measures. These are regarded merely as subdivisions of the *U. Carboniferous Group*. Taking the highest bed of limestone (Fell-Top Limestone) as the upper limit, all below are assigned to the *L. Carboniferous Group*—the upper part embracing the Yoredale rocks, the middle part the divisions of the Limestone Series as proposed by Phillips and G. Tate, the lower part the Tuedian or Calciferous Sandstone Series. The author recognizes no clear lines between the divisions of his lower group. The Tuedians are for the most part different in character from the beds above them; but it is contended that the upper beds of this series dovetail into the lower beds of the division next above, so that no definite line can be drawn through the county. The beds between the Fell-Top Limestone and the Tuedians are called the Bernician Series, the term Yoredale being abandoned (see Geological Record for 1875, p. 28). The author proposes his divisions for Northumberland only, remarking that classifications of the Carboniferous rocks can have only a local value. W. T.

Lebour, G. A. Range of *Saccamina Carteri*, Brady. *Geol. Mag.* dec. ii. vol. iii. pp. 135, 136.

In Northumberland, so far as known, *Saccamina Carteri* occurred only in the Four-Fathom Limestone. In other districts it has a more extended range. W. T.

——. Note sur deux fossiles du Calcaire Carbonifère du Northumberland. *Ann. Soc. Géol. Belg.* t. iii. pp. 21–24.

Lingula Scotica, Dav., occurs at Ridsdale; the author has recently found *Agelacrinites* (*Lepidodiscus*) *squamosus*, Meek and Worthen, at East Woodburn, in beds at the same horizon. Both these species occur in the Carboniferous Limestone of Nebraska, U. S. W. T.

——. On the Limits of the Yoredale Series in the North of England. *Rep. Brit. Assoc.* for 1875, *Sections*, pp. 74–76. (See Geological Record for 1875, p. 28.)

Linford, William. Notes on some fossils found at Bude. *Trans. R. Geol. Soc. Cornwall*, vol. ix. part ii. pp. 182, 183.

The fossils are chiefly plant impressions.

Linnarsson, Prof. G. Oldest Fossiliferous Rocks of Northern Europe. *Geol. Mag.* dec. ii. vol. iii. pp. 287, 288.

The Swedish and British areas subsided simultaneously in Cambrian and Silurian times; the British area sank faster. There is less difference in fauna between the Harlech and Menevian than between the Menevian and Lingula Flags, or between the latter and the Tremadoc group. The lowest Russian rocks are Lingula Flags or older; and the *Paradoxides* and *Olenus* beds of Sweden are oceanic. W. H. D.

Lobley, J. L. Excursion to Bromley, Sundridge, and Chislehurst. *Proc. Geol. Assoc.* vol. iv. no. 8, pp. 498–502.

Describes sections in the L. Tertiaries and Chalk.

Lockert, —. Deux projets sur la traversée du Pas-de-Calais: Tunnel sous-marin par M. Michel Chevalier; Passage à ciel ouvert par M. Vérard de Sainte-Anne; Examen comparatif. [Submarine and open-air schemes for crossing the Channel considered.] 8 pp. 4to. *Paris.*

Mackintosh, D. On the Correlation of the Deposits in Cefn and Pont-newydd Caves with the Drifts of the North-west of England and Wales. *Quart. Journ. Geol. Soc.* vol. xxxii. pp. 91–94.

The lowest deposit, loam with bones and pebbles, probably represents the Middle Drift of the plains, washed in by the sea during a rise of the land. Some subsequent deposits were introduced through the roof, and a crust of stalagmite was formed. A clay, which once nearly filled the caves, seems to have been chiefly washed in through the mouth, and probably represents the Upper Boulder Clay. This clay contains the usual Cave Mammalia. The highest deposit is loam, with sand and sea-shells, probably introduced, during emergence, by the sea through a fissure in the roof. W. T.

Mackintosh, D. On the Mode of Occurrence and Derivation of Beds of Drifted Coal, near Corwen, North Wales. *Quart. Journ. Geol. Soc.* vol. xxxii. pp. 451–453.

The coaly matter occurs in fine gravelly Drift. It probably came from the Cefn and Ruabon district, 12 miles E. of Corwen, and was transported during an interglacial period when the land was partially submerged. This direction of transport is opposite to that of the glaciation of the district. W. T.

——. New and Extensive Sections of Boulder-clay at Liverpool. *Geol. Mag.* dec. ii. vol. iii. p. 429.

Calls attention to section at the new Canada Docks, Bootle.

——. On the Origin of two polished and sharpened Stones from Cefn Cave. *Rep. Brit. Assoc.* for 1875, *Sections*, pp. 75, 76.

The fragments are limestone; the author believes them to have been polished by sea-waves, carrying broken ice.

MacMurtrie, J. On certain Isolated Areas of Mountain Limestone at Luckington and Vobster, in the County of Somerset. *Proc. Bath Field Club*, vol. iii. no. 3, pp. 287–300; 2 plates (map and section).

Notes all the facts connected with the mode of occurrence of these limestone-masses, and the several hypotheses that have been suggested to account for their abnormal position in the midst of the Coal Measures. Notices their limited thickness, the lack of positive evidence of faults, and the presence of Coal Measures beneath. Thinks that they have not been upheaved from below, but have been folded over from the main anticlinal of the Mendips. H. B. W.

——. Notes on the Physical Geology of the Carboniferous Strata of Somersetshire, and associated formations. *Proc. Somerset Arch. & Nat. Hist. Soc.* vol. xxi. (n. ser. vol. i.) pp. 41–52.

Describes a section from Bath to Chewton Mendip, and points out the general divisions of the Coal Measures, their relations with the overlying rocks, and their geographical outline; with some remarks on possible areas of Coal Measures beyond the known coal-fields. Refers to the elevation of the Mendip anticlinal, and the results thereby produced on the neighbouring coal-field, as shown in the folded strata of Vobster and the overlap or side-fault of Radstock. Remarks upon the denudation of the district, and gives estimates of the amount of rock removed. H. B. W.

Marr, J. E. Fossiliferous Cambrian Shales near Caernarvon. *Quart. Journ. Geol. Soc.* vol. xxxii. pp. 134, 135.

The shales extend from about 3 miles S.W. of Caernarvon to Bangor, nearly parallel to the Menai Straits; they are faulted against L. Cambrian to the E., and they disappear against a greenstone dyke on the

W. The fossils were obtained from three places. An *Appendix*, by **H. Hicks** (see *post*, PALÆONTOLOGY), treats of the fauna, which is referred to the *Upper Arenig*. Comparisons are drawn between the Arenig Rocks of Pembrokeshire and Caernarvonshire. W. T.

Marr, J. E. Note on the Occurrence of Phosphatised Carbonate of Lime at Cave Ha, Yorkshire. *Geol. Mag.* dec. ii. vol. iii. pp. 268, 269.

[Locality about 36 miles N.W. of Leeds.] A bed of pellets cemented by phosphatic stalagmite.

Martin, J. M. The changes of Exmouth Warren. Part II. *Trans. Devon. Assoc.* vol. viii. pp. 453–460.

Refers to a former communication, in which it was shown that considerable changes had taken place in the outline and extent of the seaward portion of the warren, by which the area of dry land had been decreased; and proves by measurements that these changes are still going on, especially at the S.E. extremity. T. M. H.

Maynard, John. Note on a cross-section from Cook's Kitchen Mine to Wheal Emily Henrietta. *Rep. Miners' Assoc. Cornwall* for 1875, pp. 65–67; 3 plates. The plates alone, 43*rd Ann. Rep. R. Cornwall Pol. Soc.* for 1875.

The plates form a continuous section across about $1\frac{1}{4}$ mile of an important part of the Camborne mining-district. Some particulars are given of the four mines included in the section. C. L. F.

Mello, Rev. J. M. The Bone-caves of Creswell Crags.—2nd Paper. *Quart. Journ. Geol. Soc.* vol. xxxii. pp. 240–244; 3 woodcuts.

The first paper described Pin Hole (see GEOLOGICAL RECORD for 1875, pp. 30, 273). Supplementary notes on this cavern are given. Robin-Hood Cave, a little lower down the ravine, was explored by the author and Mr. T. Heath. The highest bed contained Roman and Mediæval pottery, &c. Below this, over part of the cave, was a limestone-breccia (*a*); below this again was cave-earth (*b*); where the breccia was thickest the cave-earth was thinnest. Red sand (*c*) underlay the cave-earth; the bottom bed was light-coloured sand and limestone fragments. Bones of *Hyæna, Elephas*, &c. occurred in *a*, *b*, and *c*; implements in *a* and *b*. W. T.

——. Hand-Book to the Geology of Derbyshire. Pp. 72; 7 plates (sections and fossils), geological map. 8vo. *London*.

Describes the various formations, beginning with the newest (Recent deposits to Carboniferous Limestone), and gives a list of minerals. Pl. vi. consists of 2 sections W. to E. across the county, from Axe Edge to Bolsover, and from Wirksworth to Kirkby Forest. Another plate is a vertical section of the Coal Field. W. W.

Mello, Rev. J. M., and **T. Heath.** On the Exploration of Creswell Crags Caves. *Trans. Manch. Geol. Soc.* vol. xiv. pp. 103–111.
Notices the Pin Hole and Robin-Hood caves.

Milne-Home, D. Notice of High-water marks on the Banks of the River Tweed and some of its Tributaries; and also of Drift deposits in the Valley of the Tweed. *Trans. R. Soc. Edin.* vol. xxvii. pt. 4, pp. 513–562, pls. 35–38; woodcuts.
1. River Tweed and its Banks; 2. Districts adjoining the Valley of the Tweed; 3. Theoretical Views; 4. Views of other Geologists.
R. E., Jun.

——. On the Parallel Roads of Lochaber. *Trans. R. Soc. Edin.* vol. xxvii. pt. 4, pp. 595–649, pls. 41–43; woodcuts (one plate is a general plan of Lochaber &c.); *Proc. R. Soc. Edinb.* vol. ix. pp. 159, 160.
Reviews the papers on the subject since 1817, and concludes that the valleys in which these roads occur have been occupied by lakes which subsided from one level to another, as the blockages of the lakes, formed of detritus, were worn down by the action of rivers. Before the formation of the lakes a submergence of at least 3000 feet took place, when currents with floating ice spread detrital matter over what was then the sea-bottom, the ice smoothing and scratching the rocks over which it passed. The direction of this current was from the W.N.W.
R. E., Jun.

Moore, C. [Geological characteristics of Vallis, Somerset.] *Proc. Somerset Nat. Hist. Soc.* vol. xxi. (New Series, vol. i.) pp. 31–39.
Refers to the upheaval of the Mendip Hills, which he considers to have been sudden, and alludes to his discovery of igneous rock near Stoke Lane. Notices the occurrence, at Holwell and Charterhouse, of veins in the Carboniferous Limestone composed of Rhætic and Liassic material. Thinks that the minerals in the veins, whether iron- or lead-ores, are as young as these fossiliferous deposits. H. B. W.

——. On the Age of the Durdham Down Deposit, yielding *Thecodontosaurus*, &c. *Rep. Brit. Assoc.* for 1875, *Sections*, pp. 77, 78.
The deposits occur in hollows in Carboniferous Limestone, believed to be of Rhætic age, and to have remained open during part of the Lias.

——. The Geology of Bath. 'The Original Bath Guide' [New Ed.], pp. 120–123.

Morris, Prof. John. The Physical Structure of the London Basin, considered in its Relation to the Geology of the Neighbourhood of Watford. *Trans. Watford Nat. Hist. Soc.* vol. i. pt. iv. pp. 89–107; 5 woodcuts (sections).
The characters, climatal conditions, fossils, &c. of the Thanet Beds,

Woolwich and Reading Beds, London Clay, Lower Bagshot Beds, and Glacial and Post-glacial Drifts are described. W. H. D.

Morris, Prof. John. Excursion to Blackheath and Charlton. *Proc. Geol. Assoc.* vol. iv. no. 9, p. 557.

Mortimer, J. R. The Distribution of Flint in the Chalk of Yorkshire. *Quart. Journ. Geol. Soc.* vol. xxxii., *Proceedings*, p. 131. (Abstract.)

The Wolds resemble an atoll or reef. The Chalk with and that without flints appear to be contemporaneous, the change being lateral.

Morton, G. H. Records of Glacial Striæ in Denbighshire, Flintshire, and Anglesea. *Proc. Liverpool Geol. Soc.* vol. iii. part ii. pp. 123–126.

At Llangmynech, direction E.N.E.; at Llangollen, E. and W.; both in the valley, and at 1200 feet: at Pentraeth (Anglesea), N.E. and S.W. C. E. D.

——. The Carboniferous Limestone and Millstone Grit of North Wales. *Proc. Liverpool Geol. Soc.* vol. iii. part ii. pp. 152–205; 5 plates and 4 woodcuts.

Gives a list of the various papers and works relating to the district, and an abstract of the more important. Describes the Eglwyseg rocks, a precipitous and lofty ridge of L. Carboniferous rocks near Llangollen, no less than 1200 feet of Carboniferous Limestone being seen in one unbroken series, overlain by the Cefn-y-Fedw Sandstone and its associated shales, 720 feet thick. The whole series is minutely subdivided from the L. Limestone upwards, the local variations in thickness noted, and peculiar fossils described. C. E. D.

——. Section of Boulder Clay, North Docks, Liverpool. *Geol. Mag.* dec. ii. vol. iii. pp. 526, 527.

Report sent to the Boulder Committee of the Brit. Assoc.

Moss, Richard J. Report on the Exploration of Ballybetagh Bog. *Proc. R. Irish Acad.* ser. ii. vol. ii. p. 547–552; woodcut.

30 years ago an extensive deposit of remains of *Cervus megaceros* was discovered in Ballybetagh Bog, Co. Dublin; and in the summer of 1875 a scientific exploration of the ground was determined on. This resulted in a very large find of bones representing about 50 individuals. The bones were found under a considerable thickness of peat, and in and under blue and brown clay. In one place 19 skulls, with antlers attached, were found huddled and locked together amongst granite boulders, apparently the margin of an old mountain-tarn. In this and the former exploration remains of 80 individuals of the Irish Elk have been got. Some nodules of Vivianite were found in the clays. E. T. H.

Murchison, J. H. British Lead Mines. With Maps of the Durham, Northumberland, Shropshire, Cardiganshire, and Montgomeryshire Lead Mining Districts. Pp. 30; 3 maps. 8vo. *London.*

Nicholson, Prof. H. A., and **Charles Lapworth.** On the Central Group of the Silurian Series of the North of England. *Rep. Brit. Assoc.* for 1875, *Sections*, pp. 78, 79.

The rocks are grouped as follows in ascending order:—*A.* Coniston Limestone Series—Dufton Shales, Coniston Limestone, Trinucleus Shales; *B.* Coniston Mudstone Series—Skelgill Beds, Knock Beds. The Coniston Mudstone Series is Middle Silurian, the equivalent of the L. and U. Llandovery and Tarannon Shales. This series is distinct from the Coniston Flags, which form the true base of the U. Silurian, the equivalents of the Denbighshire Flags, and of the Balmae and Riccarton Beds of S. Scotland. W. T.

Norton, H. A Report of three visits to Pakefield and Kessingland ...., 1875. Supplement to the *Norfolk Chronicle*, May 6.

Describes the lithological characters and variations in the beds along the base of the cliffs beneath the Middle Glacial sands. Mentions a local deposit of black laminated micaceous clay, and remarks that it could not be continuous with the Chillesford Beds as described by Mr. Gunn. Saw no stumps of trees that had grown *in situ*, and questions the use of the term "Forest Bed." H. B. W.

Parry, Samuel. Human Remains beneath Boulder Clay? *Geol. Mag.* dec. ii. vol. iii. p. 528.

Records the discovery of human bones in slaty clay at Rhyl (N. Wales). This clay, with an associated bed of peat, is thought to pass inland under Boulder Clay. Section given. W. H. D.

Parsons, Dr. H. F. The Maritime Plants and Tidal Rivers of the West Riding. *Naturalist*, ser. 2, vol. i. pp. 113–120.

Analysis, by **E. Hunter**, of the Warp of the Humber; and list of Diatoms found therein, pp. 119, 120.

Pengelly, W. Eleventh Report of the Committee for Exploring Kent's Cavern, Devonshire. *Rep. Brit. Assoc.* for 1875, pp. 1–13.

Clinnick's Gallery.—The cave-earth is sometimes absent, the two stalagmites coming together. The older or crystalline stalagmite was broken and disturbed before the deposition of the newer or granular stalagmite. The breccia yielded remains of the lion and bear, and some flint implements. *Cave of Inscriptions.*—The inscriptions are mentioned, the earliest being dated 1609; a thin layer of cave-earth extends throughout, which occasionally comes in contact with the breccia; the older stalagmite is broken, as already mentioned. The remains found here are described, and also the work done in the *Recess*, the *Alcove*, and the *Great Oven*. Throughout the cavern the cave-earth always contains remains of hyæna; near the entrances remains

of other animals also occur; but in the recesses the hyæna occurs alone. W. T.

Pengelly, W. Notes on Recent Notices of the Geology and Palæontology of Devonshire.—Part III. *Trans. Devon. Assoc.* vol. viii. pp. 148–244.

Corrections of statements published during the preceding twelve months regarding Brixham and Kent's Caverns.

——. First Report of the Committee on Scientific Memoranda. *Trans. Devon. Assoc.* vol. viii. pp. 439, 440.

Notices the existence of a group of boulders at Langtree, North Devon, about 500 feet above sea-level, and the discovery of a portion of antler of *Cervus elaphus* on Tor Abbey sands. T. M. H.

——. Kent's Cavern: its Testimony to the Antiquity of Man. (Glasgow Science Lectures.) Pp. 32; 10 woodcuts. 8vo. *London* and *Glasgow*.

Gives a history of the exploration, and a summary of the results.

Penning, W. H. Notes on the Physical Geology of East Anglia during the Glacial Period. *Quart. Journ. Geol. Soc.* vol. xxxii. pp. 191–204, pl. xv. (map and section).

The main feature of the district is the Chalk Escarpment, from 300 to 500 feet high; to the N. and W. of this is the Cambridge Valley, of pre-glacial age; to the S. and E. the ground falls towards the Tertiaries of the London Basin. The order of events was as follows:—After the formation of the Cromer Forest-bed the land gradually sank: the "pebbly sands" were first formed along the advancing shore-line; then the L. Glacial series, by means of icebergs. As submergence went on, a strong current swept between the North Sea and the Atlantic, spreading out the sands and gravels known as Middle Glacial. The high land of chalk prevented this current from entering the Cambridge Valley; hence there is no Middle Drift in that area, but the sands spread far up the S. slope of the Chalk. Continued submergence allowed the sea to cross the Chalk escarpment at its lower points; this checked the current, and the deposition of gravel was gradually stopped. The land still sank, and was at last quite submerged. Icebergs then spread the U. Glacial Clay over the whole area. As the land rose, "denudation gravels" were formed by the sorting action of the waves; these are found on the higher land on both sides of the escarpment. In the Cambridge Valley there are three or more terraces of gravel at various heights. There are also gravels at from 20 to 60 feet above the Cam; these gravels have in some respects a Middle Glacial look; but the author refers them all to river-action, and he believes that there are no L. or M. Glacial deposits within the area of the Cambridge Valley.

W. T

Penning, W. H. Concretions. *Geol. Mag.* dec. ii. vol. iii. pp. 218–220.

Describes iron-concretions in Lower Greensand at Sandy, Bedfordshire, and their method of formation.

Pickwell, Robert. Geological changes along our Eastern Shore. *Land and Water*, Sept. 30 (an epitome of a letter to the *Eastern Morning News*).

Refers to the accumulation of mud in the Humber. From a survey of the coast between Spurn Point and Flamborough Head, concludes that the bulk of the alluvium is derived from the waste of these cliffs. Suggestions are given to prevent the silting up of the estuary of the Humber. G. H. K.

Plant, John. Recent Discoveries in the Alluvial Deposits of the Irwell, in Salford. *Trans. Manch. Geol. Soc.* vol. xiii. part xi. pp. 372–374.

Describes occurrences of 3 black-stained oak logs, under 6 feet of loam and 2 feet of gravel, in the alluvium at Lower Broughton,—drifted probably in former times from peat-moors higher up the stream. C. E. D.

——. Submerged Forest near Holmfirth. *Trans. Manch. Geol. Soc.* vol. xiv. part ii. pp. 71–78.

Describes the groups of tree-trunks under the peat on the Lancashire and Yorkshire Moors of the Pennine Chain; and mentions the occurrence of trunks of large oaks, beeches, and birches at Harden Moss, N.W. of Holmfirth, at a height of 1100 feet. C. E. D.

——. Discoveries at Creswell Crags. *Trans. Manch. Geol. Soc.* vol. xiv. part ii. pp. 84–87.

These Crags form a defile in the Magnesian Limestone near Welbeck Abbey, abounding with large fissures and caves, in one of which various palæolithic and neolithic implements have been found, and bones of Pleistocene and more recent animals. C. E. D.

Plunkett, J. On the Exploration of the Knockninny Cave. With an account of the Animal Remains, by **Rev. Prof. Haughton** and **Prof. Macalister.** *Proc. R. Irish Acad.* ser. 2, vol. ii. no. 6, pp. 465–483; 11 woodcuts, and *Journ. R. Geol. Soc. Ireland*, ser. 2, vol. iv. part iii. pp. 131–140.

Knockninny hill rises about 700 feet on the S. shore of Lough Erne, about 10 miles from Enniskillen; and the cave occurs on an escarpment at about 380 feet above the valley, and is a fissure 2 to 6 feet wide, 4 to 10 high, and extending 51 feet to a second entrance. It was filled with fine layers of débris and cave-earth, in which occurred flint implements, cinerary urns (containing burnt human bones, evidently in a place of sepulture), and also scattered fragments of human bones, as well as those of various animals, a list of which is given in an appendix by **Profs. Haughton** and **Macalister.** E. T. H.

Prestwich, Prof. J. On the Geological Conditions affecting the Water Supply to Houses and Towns, with special reference to the modes of supplying Oxford. Pp. 48; plates (map and sections). 8vo. *Oxford* and *London*.

Oxford stands on a terrace of gravel overlying Oxford Clay: the water in the gravel for many years formed the only supply to the city. The supply is now got from the valley gravels below the town; but this is liable to contamination. Other possible sources of supply are:—Springs near Oxford (Coralline Oolite or Portland Beds), Artesian Wells sunk into the Lower Oolites, springs in the Chalk and Oolitic Districts, and Underground Chalk Waters. The geological conditions affecting these sources are examined; and information is given as to thickness of rocks, height, quality, yield of springs, &c. The author suggests corrections in the interpretation of the boring at Wytham, 633 feet deep (made in 1829). Instead of 600 feet of Oxford Clay in the section, he admits only 273 feet; whilst the lowest 170 feet he regards as Marlstone and L. Lias. The U. Lias is not present. Remarks are also made on the St. Clement's Well (see below). W. T.

——. Thickness of the Oxford Clay. *Geol. Mag.* dec. ii. vol. iii. pp. 237–239.

A reprint of those parts of the foregoing which relate to the Wytham boring.

——. On the Mineral Water discovered in sinking the Artesian Well at St. Clement's, Oxford; and on certain Geological Inferences suggested by the Character of the Water. (With Analysis by **W. F. Donkin.**) *Proc. Ashmolean Soc.*

The boring, made in 1832, was carried 420 feet through Oxford Clay and Oolitic strata. The water contains 1277 grains of solid matter a gallon, of which 493 are sulphates of soda and lime, 748 chloride of sodium. The proportion of saline matter is larger than in any other English spring; and it most nearly resembles water from the New Red Sandstone. The author passes in review the evidence in favour of the thinning of the Lower Secondary rocks towards the S.E. of England, and he infers that the boring really reached New Red Sandstone. W. T.

Price, F. G. H. Note on the Annelid Bed in the Gault of Kent. *Geol. Mag.* dec. ii. vol. iii. pp. 190, 191.

The tabular ironstone of the Gault is full of Annelid borings.

——. Excursion to Sandgate and Folkestone. *Proc. Geol. Assoc.* vol. iv. no. 9, pp. 554–556.

Describes beds from the Sandgate Beds to the so-called "Upper Greensand." (See GEOLOGICAL RECORD for 1875, p. 35.)

Ramsay, Prof. A. C. How Anglesey became an Island. *Quart. Journ. Geol. Soc.* vol. xxxii. pp. 116–122, pl. xiv. (map and section).

Anglesey and the neighbouring mainland form an undulating plain,

surrounded by valleys, which generally run N.E. and S.W. The Menai Straits occupy such a valley. The glacial striæ of this low land generally run from about 30° to 40° W. of S., or nearly parallel with the valleys, all of which have been worn in comparatively soft rocks. The author infers that these valleys had been mainly hollowed by an ice-sheet coming from the Lake District, large enough to prevent the local glaciers of the Snowdon range from intruding upon the low grounds of Anglesey. In this manner the valley of the Menai Straits was excavated. After emergence it was probably filled by Boulder Clay, which has been gradually worn away by marine waste and subaërial drainage; and thus Anglesey has become separated from the mainland. W. T.

Ramsay, Prof. A. C. On the Physical History of the Dee, Wales. *Quart. Journ. Geol. Soc.* vol. xxxii. pp. 219–229; folding section.

From Erbistock to its mouth the Dee flows in a pre-glacial valley; evidence is given that the same is true of the Dee above Erbistock. Bala Lake lies in a rock-basin; it is now 3½ miles long, but has extended for 8 miles. Evidence is given of the vast area once covered with Carboniferous rocks, which spread over a plain of marine denudadation formed of Silurian rocks. The region was disturbed and elevated before and during the deposition of the Permian beds, from which time until the Glacial period it has probably been dry land, except possibly during the deposition of the Chalk. During this long time the valleys were being excavated by subaërial action. In the Glacial period the valleys were modified in shape, and the lake-basins excavated. The main features of the country are thus preglacial; the submergence during part of the Glacial period, and subaërial waste since that period, have done but little in altering the shape of the land. W. T.

Reade, T. M. The Lower Lias of Street, Somerset. *Proc. Liverpool Geol. Soc.* vol. iii. part ii. pp. 97–99.

Describes a railway-cutting in the Rhætic Beds between Midsumer Norton and Shipton Mallet, and the L. Lias quarries of Street.

——. The Formby and Leasowe Marine Beds, as shown in a section near Freshfield. *Proc. Liverpool Geol. Soc.* vol. iii. part ii. pp. 120–122.

Excavations at North Moss Lane, 30 feet in depth, prove blue clays with *Scrobiculariæ*, &c. beneath 8 feet of peat.

——. Pebble Ridges. *Geol. Mag.* dec. ii. vol. iii. pp. 360, 361.

Describes a small beach just W. of the Bryn Ddu Limestone-quarries, Anglesea. The stones and boulders come from the W.; but at the W. end the stones are small; the large ones are carried to the E. end, and are there piled up in a ridge. The author applies the facts here observed to explain the formation of the Chesil Bank (see Geological Record for 1874, p. 32). W. T.

Reade, T. M. Section of Boulder-clay, North Docks, Liverpool. *Geol. Mag.* dec. ii. vol. iii. p. 480.
Description of section, differing in two visits.

Richardson, Ralph. The Ice-Age in Britain. Pp. 19. 8vo. *Edin.*
From the irregularities of the bed of the N. Atlantic, and the evidence of striations, concludes that Britain was united to Greenland during the Glacial epoch, either by elevation of the ocean-bed, or by subsidence of the deeper parts abstracting the water from the shallower.
W. H. D.

Ricketts, Dr. Charles. Remarks on the Country around the Wrekin. *Proc. Liverpool Geol. Soc.* vol. iii. part ii. pp. 100–117.
Describes eruptive subaërial volcanic rocks, running parallel to, and from half a mile to a mile E. of the Wrekin, lying successively on eroded Caradoc, May Hill Sandstone, and Wenlock Shale, and overlain by the Carboniferous Limestone. C. E. D.

Robertson, David. Notes on a Post-Tertiary Deposit of Shell-bearing Clay near Paisley. *Coll. Guard.* vol. xxxi. pp. 415, 416.
Full report of paper read to Geol. Soc. Glasgow.

Routledge, R. Discoveries and Inventions of the Nineteenth Century. 8vo. *London.*
Pp. 260–266 contain a notice of the Channel Tunnel scheme, with plan and geological section.

Sawyer, F. E. Erosion of the Sussex Coast. *Land and Water*, vol. xxii. June 24; from *Sussex Daily News*, June 16.
Paper read to Brighton Nat. Hist. Soc. The author believes that much of the erosion is due to earthquake-waves, and gave a list of those that are recorded since A.D. 1250. G. H. K.

Shrubsole, W. H. On the Mill Hill Cutting, Sheppey. *Proc. Geol. Assoc.* vol. iv. no. 9, p. 569 (Abstract).
Suggests that fragments of foreign rocks overlying the Bagshot Sand of Minster may be of Glacial origin.

Skertchly, S. B. J. Inter-glacial Man. *Geol. Mag.* dec. ii. vol. iii. p. 476.

——. On the Discovery of Palæolithic Implements of Interglacial Age. *Nature*, vol. xiv. pp. 448, 449.

——. On the Relations of the Stone Age to the Glacial Epoch and the Present Time. *Eastern Daily Press*, Dec. 7.

——. [On Palæolithic Implements found at Brandon.] *Norwich Geol. Soc.* Reprinted from *Norwich Mercury*, Nov. 11.
These four papers refer to the author's discovery of Palæolithic implements at Brandon, in brickearth, which he thinks older than the Upper Boulder Clay of Norfolk. The sequence of Glacial beds, and

the relative ages of the Boulder clays of East Anglia and those of the N. of England and of Scotland, are discussed. The author thinks that the Palæolithic implements found at Brandon and other places in the Eastern counties are of Interglacial age; for, although some are found above the Chalky Boulder Clay, yet this deposit is much older than certain glacial deposits of the N. of England and of Scotland. The character of the changes during the Glacial period is discussed.

H. B. W.

Smyth, W. W. Address of the President for 1875. 62*nd Ann. Rep. R. Cornwall Geol. Soc.* pp. ix–xxii.

Particulars are given of the Wealden boring, the deep Adalbert shaft at Przibram, and the Simon Lambert coal-pit near Charleroi.

Spencer, J. Geology of the Halifax Hard Bed Coal. *Naturalist*, n. ser. vol. i. nos. 11, 12, pp. 163, 164, 182–184.

This seam ranges from Leeds to beyond Sheffield. It rests generally on ganister, and contains nodules of pyrites and carbonate of lime. It is followed by marine beds, but preceded by freshwater beds with *Anthracosia*, which also occurs in the Middle Coal Measures (above). The oscillations thus indicated are described, and the range in time of the Cephalopoda alluded to. W. H. D.

Stirrup, Mark. The raised beaches of County Antrim, their molluscan fauna, and flint implements. *Proc. Lit. Phil. Soc. Manch.* Nov. 6.

Stirton, J. On the Cryptogamic Botany of the West of Scotland. Pp. xxv–xxxi of "Notes on the Fauna and Flora of the West of Scotland." 8vo. *Glasgow.*

Gives notes on distribution as affected by rocks and soils.

Stoddart, W. W. Geology of the Bristol Coal-field. Part 3. Carboniferous. *Proc. Bristol Nat. Soc.* n. ser. vol. i. pt. 3, pp. 313–350.

Points out that the junction between the Old Red Sandstone and Carboniferous rocks is so gradual that it is impossible to say where one ends and the other begins. Describes some of the more remarkable faults and disturbances in the Carboniferous rocks. Gives a particular account of the section in the Avon cliffs, with lists of fossils. The species from the L. Carboniferous shales are compared with those from the U. Devonian strata of N. Devon, and from the L. Carboniferous beds of Ireland and Scotland. Analyses are given of the hæmatite-ores from Clifton, Ashton, and Winford. A general list is given of the principal fossils from the Carboniferous Limestone of the district—the localities cited being Cheddar, Portishead, Henbury, Weston, Clevedon, and the Mendip Hills generally. The Millstone Grit and Coal Measures are described, and a list of fossils from the Pennant Sandstone is given. The formation of coal is briefly treated of, and its production

from woody fibre explained. 13 analyses of coals are given, and a list of the fossil plants from the Coal Measures of the district. H. B. W.

Stokes, —. On Coal. *Land and Water*, vol. xxii. no. 570, p. 465.
Gives an account of the Derbyshire coal-field, and of a live caterpillar (larva of *Cossus ligniperda*) found in coal, at a depth of 68 yards, at Highmoor, Eckington (read at the Derby Naturalists' Society). G. H. K.

Symonds, Rev. W. S. The Geology and Archæology of Malvern. *Proc. Cotteswold Nat. Field Club*, vol. vi. pp. 247–256.
Notes on the Drift, L. Lias, Rhætic, Triassic, and Permian. Some pebble-beds towards the base of the Water-stones (Keuper) contain pebbles of a quartz-rock, like those of the Budleigh-Salterton pebble-bed. H. B. W.

Tate, [Prof.] R., and J. F. Blake. The Yorkshire Lias. Pp. ix, 475, xii. Geological Map (scale ½ inch to a mile); 4 plates of sections; 19 plates of fossils and 10 woodcuts. 8vo. *London.*
Part I. Geology (pp. 1–238). Chap. i. General Range of Liassic Strata on the Continent and British Isles. ii. Literature of the Yorkshire Lias. iii. Range, Extent, and General Characters of the Yorkshire Lias (with table of classifications). iv. Relations of the Lias and Inferior Oolite. v. Rhætic Series and the Relations of the Lias with the Keuper. vi–xii. Zones of *Ammonites planorbis*, *A. angulatus*, *A. Bucklandi*, *A. oxynotus*, *A. Jamesoni*, *A. capricornus*, *A. margaritatus*. xiii. The Ironstone, or zone of *A. spinatus* (Lateral Changes, Isochthonal Lines, Sections and Range, Inliers, General Observations on the Organic Remains). xiv. Historical Sketch of the Discovery and Industrial Applications of the Cleveland Main Seam (Chemical Composition, Origin). xv. Zone of *A. annulatus*. xvi. Jet-Rock Series, or zone of *A. serpentinus* (Range and Exposure, Working, &c.). xvii. Zone of *A. communis*, or Alum-Shale. xviii. Zone of *A. Jurensis*. xix. Stratigraphical Phenomena (Thickness of Strata, Dip and Undulations, Faults, the Basaltic Dyke). xx. Conclusions, including a Synoptical Table of Fossils from the Yorkshire Lias.—Details of Sections and Lists of Fossils throughout.
Part II. Palæontology. (See *post*, under PALÆONTOLOGY.) W. T.

Tate, Thomas. The Glacial Deposits of the Bradford Basin. *Proc. Geol. Soc. W. Riding Yorksh.* n. s. pt. ii. pp. 101–107.
Describes Preglacial river gravel, Lower Till, Upper Till, and a blue clay full of local rocks, and not calcareous.

Tawny, E. B. On the Age of Cannington Park Limestone, and its relation to the Coal Measures South of the Mendips. *Proc. Bristol Nat. Soc.* n. ser. vol. i. pt. iii. pp. 380–387.
Discusses opinions concerning the age of this limestone, and records the chief observations upon it. Notes the occurrence in it of *Lithostrotion irregulare* and of a species of *Producta*. Recognizes a litho-

logical resemblance to the Carboniferous Limestone of the Mendips. Observes that the mass is part of a dome or fold, and considers that it is Carboniferous—a fact which strengthens our hopes of finding coal beneath the Somersetshire marshes. H. B. W.

Taylor, J. E. Discovery of a Submerged Forest in the Estuary of the Orwell. *Rep. Brit. Assoc.* for 1875, *Sections*, p. 82. [See GEOLOGICAL RECORD for 1874, p. 37.]

Thomson, James. Notes on the Geology of the Garpel Water. *Coll. Guard.* vol. xxxi. p. 416.

Nearly full report of paper read to Geol. Soc. Glasgow.

Thorne, James. Handbook to the Environs of London. In two Parts. Pp. vi, 795. 8vo. *London.*

Geological references in places. The geology of Grays and its neighbourhood, by **Prof. J. Morris**, pp. 244, 245 (Chalk, Thanet Sand, Brickearth and Gravel of the Thames Valley). W. W.

Tiddeman, R. H. Third Report of the Committee appointed for the purpose of assisting in the Exploration of the Settle Caves (Victoria Cave). *Rep. Brit. Assoc.* for 1875, pp. 166–175, pls. v., vi. (photographic views).

Fresh excavations have been made in the Glacial deposits; the striated limestone boulders are chiefly blue or black, like the top beds of the Carboniferous Limestone near Penyghent, not like the white limestone in which the cave is excavated. Deposits of sand and laminated clay occur at the back of the boulders. Fresh evidence is given to prove that the striated boulders overlie the cave-earth; that the boulders were deposited by the ice-sheet; consequently that the cave-earth is older than the ice-sheet. Remains of the Pleistocene fauna are found in many caves in the N. of England, but not in the gravels of the open country, where probably glaciation has destroyed them. Details of the work, and a summary of the physical changes of which the cave affords evidence, are given. W. T.

——. The Work and Problems of the Victoria Cave Exploration. *Proc. Geol. Soc. W. Riding Yorks.* ser. 2, vol. i. pt. ii. pp. 77–93, pl. v. (section).

Summary of the results of the work (see GEOLOGICAL RECORD for 1874, pp. 8, 9, for 1875, p. 39, and above), and list of publications on the subject. W. H. D.

Topley, W. Table of the Cretaceous and Oolitic Rocks in the South East of England (scale 1000 ft. to 1 in.), distinguishing those discovered in the Sub-Wealden Boring. Section from London to St. Leonard's, through Sub-Wealden and Kentish Town Borings (scale an inch to 8 miles).

Two diagrams appended to H. Willett's Report on the Sub-Wealden exploration (dated Feb. 14).

Topley, W. On the Channel Tunnel. *Rep. Brit. Assoc.* for 1876, *Sections*, p. 253.

Describes the characters of the beds forming the Straits of Dover; refers to the various lines of tunnel proposed, and shows that the line through the Chalk is the best. W. T.

Traill, W. A. On the Occurrence of a Lower Boulder Clay or Till, with Shells, in the Counties of Down and Mayo, Ireland. *Rep. Brit. Assoc.* for 1875, *Sections*, pp. 83, 84.

The shells occur in four places near the Kilkeel and Whitewater Rivers, in Co. Down, and in several places on the Glenulra River, near Ballycastle, Co. Mayo. The Till overlies glaciated rock, and is overlain by the Middle Sands and Gravels. W. T.

——. On a Mass of Travertine or Calcareous Tuff, called "the Glen Rock," near Ballycastle, Co. Mayo, Ireland. *Rep. Brit. Assoc.* for 1875, *Sections*, p. 84. [See GEOLOGICAL RECORD for 1875, p. 40.]

Tyack, William. On a Deposit of Quartz Gravel at Blue Pool, in Crowan. *Trans. R. Geol. Soc. Cornwall*, vol. ix. part ii. pp. 177–181.

The gravel is about 400 feet above the sea-level, near the watershed of Cornwall. It was probably the bed of an old river when the surface configuration of the country was very different. C. L. F.

Tyndall, Prof. John. The Parallel Roads of Glen Roy. *Pop. Sci. Rev.* vol. xv. pp. 375–388, pl. cxli. (map) and woodcut; *Proc. R. Inst.* vol. viii. pp. 233–245, map.

Gives a history of the subject, a description of the district, and notes on the physics of the Glacial Period. Infers that the terraces were formed on the margins of lakes dammed by barriers of glacier-ice. W. T.

Ussher, W. A. E. On the Triassic Rocks of Somerset and Devon. *Quart. Journ. Geol. Soc.* vol. xxxii. pp. 367–394; 3 woodcut-sections.

An extension of the paper noticed in the GEOLOGICAL RECORD for 1875, p. 41. The Trias is divisible into three groups, occupying distinct areas. In that N. of the Mendips the beds consist chiefly of marls with dolomitic conglomerate. The second area lies S. of the Polden Hills as far as a N. and S. line through Taunton; here also the beds are chiefly marls with a little sandstone; the lower beds are sandstone, and perhaps a breccia. In the third area, including the great mass of the Trias W. of Taunton and Blackburn, the beds are much more complex. The upper part consists of marls with thin sandstones, underlain by sandstones (these two are the equivalents of the whole series of the second area); below the sandstones come pebble-beds, to which belong the Budleigh-Salterton conglomerate. Marls underlie the conglomerate. The base of the whole is composed of sandstone, breccia, and occasional clays. This last division probably represents part of the

Bunter. The total thickness probably lies between 2500 and 3500 feet. W. T.

Ussher, W. A. E. On some old Gravels of the River Dart, between Totnes and Holne Bridge. *Trans. Devon Assoc.* vol. viii. pp. 427–433, plate (sections) and woodcut.

Directs attention to the gravels and boulders near Totnes, which show that the Dart flowed at a higher level; and suggests that the volume of water was in former times greater, and enough to excavate a gorge over 60 feet deep through the slate rocks. T. M. H.

Verini, William. Section of the Strata passed through in boring at the Colne Valley Waterworks. *Trans. Watford Nat. Hist. Soc.* vol. i. pt. 5, p. 135.

Depth 235 feet in 6 beds of variable chalk.

Walker, Henry. Excursion to Bromley, Sundridge Park, and Chislehurst. Excursion to Crayford. Excursion to Riddlesdown. *Proc. W. Lond. Sci. Assoc.* vol. i. pt. ii. pp. 71–73, pp. 74–76, pt. iii. pp. 84–90.

1. Woolwich Beds, Oldhaven Beds, and London Clay were examined. 2. List of Pleistocene mammals. A mammoth-tusk, 7 feet long, and other bones and shells were found. 3. Notes on the Chalk Downs near Croydon, the perennial hill-top ponds, and the Croydon Bourne. W. H. D.

Ward, J. C. The Geology of the Northern Part of the English Lake District. With an Appendix on New Species of Fossils by **R. Etheridge** (see *post*, under INVERTEBRATA). Pp. xii, 132; 13 plates (microscopic rock-structure, maps, sections, views, and fossils). *Geological Survey Memoir.* 8vo. London.

Chap. i. Physical Geography. ii. General Description of the Rocks. iii. Skiddaw Slate. iv. Volcanic Series of Borrowdale. vi. Igneous Rocks. vii. General Position and Lie of the Rocks. viii. Faults. ix. Mineral Veins (Lead, Copper, Iron, Barytes, Cobalt, Nickel, and Antimony). x. Graphite. xi. Cleavage. xii. Original Relation of the Formations to each other, and their Physical History. xiii. Glacial Phenomena. xiv. Relation of Scenery to Geology. xv. Fossils of the Skiddaw Slates (lists of species and localities). Appendix B. Bibliography of the District. The analyses of rocks in chaps. iii.–vi. are by **J. Hughes**; those in chaps. ix. and x. are quoted. W. H. D.

——. On the Granitic, Granitoid, and Associated Metamorphic Rocks of the Lake-District. Parts III.–V. *Quart. Journ. Geol. Soc.* vol. xxxii. pp. 1–34, pls. i., ii. (microscopic rock-sections); 3 woodcut maps.

Part III. *On the Skiddaw Granite and its associated Metamorphic Rocks*, pp. 1–11. The metamorphism of the Skiddaw Slates begins with the appearance of small spots which, further towards the granite, change into chiastolite crystals. This *chiastolite-slate* changes into

spotted schist (formerly called hornblende-schist); mica appears, becomes more abundant, and the rock changes into *mica schist*. The junction of this with the granite is generally sharp, and the schist near the junction is often much contorted. Analyses (by **J. Hughes**) show that the metamorphosed slate contains less silica and more alumina than the unaltered rock; the granite contains more silica and less alumina than the Skiddaw Slates, but it resembles this more than it does the metamorphosed rock. Concludes that the granite is not due to the metamorphism of rocks such as occur in its neighbourhood, but may perhaps be due to metamorphism of underlying parts of the same series.

Part IV. *On the Quartz-Felsite, Syenitic, and associated Metamorphic Rocks of the Lake-District*, pp. 11–27. Refers chiefly to St. John's Vale, Buttermere, and Ennerdale, Carrock Fell, Milton Hill, and Mosedale Crags. The rocks, which lie for the most part at the junction of the Volcanic and Skiddaw series, probably represent the transition beds between the two, in great measure metamorphosed in place. Chemical and microscopic examination show the possibility of these rocks being thus formed. The metamorphism took place at great depths; and the rocks may have been much silicated from below. The resulting magma probably became occasionally intrusive among and absorptive of higher beds.

Part V. *General Summary* (of this paper, and of that noticed in the Geological Record for 1875, p. 42). Reviews the results under the following heads:—Granite at various depths; How far granite may be an ultimate product of metamorphism; Distribution of metamorphism (selective metamorphism); Classes of metamorphism. In Appendices to Parts iii. and iv. there are notices of previous papers on the subject.
W. T.

Ward, J. C. Sketch of the Geological History of the Lake District. *Trans. Cumb. Assoc.* part i. pp. 59–64, diagram map and section.

The Skiddaw Slates, Volcanic Series, Coniston Limestone, U. Silurian, and Devonian rocks are described, and the course of events in those periods traced. W. H. D.

Ward, Dr. Ogier. On the Sinking of the South Coast of England. *Papers Eastbourne Nat. Hist. Soc.*

Gives evidence of subsidence and denudation on the coasts of Sussex and Hants, and in the Channel Islands.

——. On the Bones of Man and Animals found at Eastbourne. *Papers Eastbourne Nat. Hist. Soc.*

Describes a series (of Chalk-rubble, peat, clay, gravel, and alluvium) containing bones of more than 20 species of Mammals, tabulated for each bed separately. W. H. D.

Willett, Henry. Third Report of the Sub-Wealden Exploration Committee. *Rep. Brit. Assoc.* for 1875, pp. 346–349.

Describes the progress of the second boring to a depth of 1762 feet, proving an unexpected thickness of Secondary rocks, and that water cannot be there obtained by a deep well. It has shown the existence of thick beds of gypsum.

The "Geological Report," by **W. Topley**, notes corrections in former reports from information obtained by the second boring. The Coralline Oolite, 17 feet thick, was reached at 1769 feet. The U. and L. Calcareous Grits are either absent or are represented by sandy calcareous shales. W. T.

Williams, J. J. The Mineral Resources of Flintshire and Denbighshire. *Trans. N. Engl. Inst. Eng.* vol. xxv. pp. 81–100; map and woodcut.

Gives list of Minerals found in the district. Describes the geological structure of the country, and then notes in greater detail the minerals of chief importance, which are:—Hæmatite (only in the lower beds of Carboniferous Limestone), pure silica and carbonate of lime, chert, hydraulic limestone (called "Aberdaw"), clay-ironstone, fire clay, galena, blende, and coal. Lists of Lead Mines and Collieries are given. W. T.

Wilson, E. On the Permians of the North-East of England (at their Southern Margin), and their Relations to the under- and overlying Formations. *Quart. Journ. Geol. Soc.* vol. xxxii. pp. 533–537, folding sections.

The section described rises from Hempshill cutting near Cinderhill to Kimberley West station; on the Great Northern Derbyshire Extension Line, and shows the whole series of the Permians of the district. There is a perfect passage to the Bunter above, whilst there is a strong unconformity to the Coal Measures beneath. W. T.

Wilson, J. M. Note on some Bones found in a Drift at Lawford. *Rep. Rugby School Nat. Hist. Soc.* for 1875, pp. 73, 74, pl. 6 (map).

Bones of Bison and Reindeer, with fragments of shells in Glacial clay.

Winwood, Rev. H. H. Note on a Rhætic and Lower Lias section on the Bath and Evercreech Line, near Chilcompton. *Proc. Bath Field Club*, vol. iii. no. 3, pp. 300–304.

The L. Lias and Rhætic beds are faulted against the Dolomitic Conglomerate. The White Lias, with its top "Sun-bed," is noticed, and several species are recorded from the L. Lias above. H. B. W.

Witchell, E. Observations upon a Bed of Fuller's Earth at Whiteshill, near Stroud. *Proc. Cotteswold Field Club*, vol. vi. pp. 144, 145.

A mass of Fuller's Earth occurs in a fissure or depression of the Inferior Oolite, to which cause its preservation is due, the main deposit

having been removed by denudation. Cites this fact in support of his opinion that the dry valleys or combes of the Cotteswolds have been in great measure formed by the erosive action of springs thrown out by the Fuller's Earth, at a period when that formation extended much further westwards. H. B. W.

Witchell, E. On the Angular Gravel of the Cotteswolds. *Proc. Cotteswold Club*, vol. vi. pp. 146–153.

This gravel occurs on the slopes of the hills, and is distinct from the Oolitic Gravel of the river-valleys and from the Northern Drift. A section at Longford's Lake, near Nailsworth, shows the Angular Gravel overlying and partly intercalated with the River Gravel, proving that the former was being deposited when the stream was either depositing or rearranging the latter, and before it had excavated the bottom of the valley to its present depth. Sections at Hyde House and Pitchcombe are also described. The Angular Gravel seems to be merely detritus, due to the action of frost and surface-drainage. H. B. W.

Wood, S. V., Jun. Physical Geology of East Anglia in the Glacial Epoch. *Geol. Mag.* dec. ii. vol. iii. pp. 284–286.

Believes the Chalk-escarpment of Cambridgeshire to be pre-glacial; but the rectilinear ridges of the Hog's Back, Portsdown, &c. to be post-glacial. The East-Anglian valley-system is later than the L. Glacial deposits, but earlier than the M. Glacial. W. T.

Woodward, B. B. Note on a Section of the Thames Valley-gravel shown in digging for the foundations of the New Opera House on the Thames Embankment, near Westminster Bridge. *Proc. W. Lond. Sci. Assoc.* vol. i. part iii. pp. 78, 79.

Section 30 feet deep, in shingle, mud, peat, sand, and gravel.

Woodward, H. B. The Geology of England and Wales. A concise account of the Lithological Characters, Leading Fossils, and Economic Products of the Rocks; with notes on the Physical Features of the Country. Pp. xx, 476, geological map, 28 woodcuts. 8vo. *London.*

The rocks are described in ascending order. As a general rule the classification of the Geological Survey is followed; but to this there are some exceptions. As regards the Cambrian and Silurian rocks the author follows Sedgwick's classification. The term Devonian is retained for the beds of Devonshire; but the arguments for grouping them with the Old Red and Carboniferous are also given. The Permian and New Red are described together under the term Poikilitic. The Rhætics are regarded as passage-beds between the New Red Marl and Lias; the Midford Sands as passage-beds between the Lias and Oolite. Recent researches regarding the Oolites are described, and their conclusions adopted. The Hempstead Beds are retained in the Eocene; the Bovey Beds in the Miocene. The Pliocene is classified as

follows:—Coralline Crag, Red Crag, Norwich Crag Series (Fluvio-marine Series, Chillesford Beds, Bure Valley Beds), Forest Bed Series. The Drifts, Alluvium, Caverns, &c. are fully described. Chap. XII. describes the Igneous and Metamorphic Rocks, and contains a synopsis of their leading characters by **F. Rutley**. Appendix A contains a Glossary of Terms; B, a synopsis of the Animal Kingdom; C and D, Lists of Geological Works, &c. W. T.

Woodward, H. B. Geology of East Somerset and the Bristol Coal-fields. With notes by **H. W. Bristow, W. A. E. Ussher,** and **J. H. Blake**; and an appendix by **F. Rutley,** on the Microscopic character of the Eruptive Rocks. Lists of Fossils, by **R. Etheridge.** Pp. x, 271, 9 plates (map, sections, and microscopic diagrams), 23 woodcuts. *Geological Survey Memoir.* 8vo. *London.*

Chap. i. Introduction. Physical geography of district, &c. ii. Silurian System (U. Llandovery Beds, Wenlock Beds, Ludlow Beds). iii. Old Red Sandstone. iv. Carboniferous system (L. Limestone Shale, Carboniferous Limestone, U. Limestone Shale, Millstone Grit, Coal Measures; with notes on coal-seams, mines, extension of beds). v. Trias (Keuper; Notes on the classification of the Triassic rocks in the S.W. of England; Penarth or Rhætic Beds; List of British Penarth fossils). vi. Lias (L. Lias, cherty and sandy beds, M. and U. Lias). vii. Oolitic Series (Midford Sands, Inferior Oolite, Fuller's Earth, Great Oolite, Bradford Clay, Forest Marble, Cornbrash, Oxford Clay, Coral Rag, Kimeridge Clay). viii. Cretaceous series (Gault, U. Greensand, Chalk, Table showing thicknesses of Lower Secondary strata). ix. Post-Pliocene Deposits (Alluvial Deposits, Gravels, &c. of the high grounds, Burtle Beds, Raised Sea-beaches, Blown Sand). x. Minerals (Iron-, Lead-, Zinc-, Copper-, and Manganese-ores, List of Minerals, Local names of rocks). xi. Springs and Water-supply, Tufa, Caverns, Fissures. xii. Faults and other disturbances, Carboniferous Limestone of Luckington and Vobster. xiii. Denudation (Inland Cliffs and Combes, Escarpments, Landslips, Weathering of rocks, Coast). *Appendices*—i., by **F. Rutley,** see *post* under PETROLOGY. ii. List of Geological Survey publications on the district. iii. Chronological List of Books, Papers, &c. on the geology, &c. of Gloucestershire and Somersetshire, by **W. Whitaker** and **H. B. Woodward.** iv. Miscellaneous. H. B. W.

——. Notes on the Gravels, Sands, and other superficial Deposits in the Neighbourhood of Newton Abbot, Devonshire. *Quart. Journ. Geol. Soc.* vol. xxxii. pp. 230–235.

Many deposits of gravel and sand near Newton Abbot, supposed to be U. Greensand, are shown to be Drift. The only true patches of Greensand in the district are those on Melber Down and E. of Combe Farm. The gravels spread from the hill-tops into the Bovey Valley, but not into the outlying valleys, and often have a sharp dip into the valley. The "Head" at the bottom of the valley has been chiefly derived from the older gravels, which it greatly resembles. Reference is made to

human and other remains from the "head," and to a breccia, now in process of formation, like that of the Trias. W. T.

Woodward, H. B. Additional Remarks upon Inversions of Carboniferous Strata in Somersetshire. *Geol. Mag.* dec. ii. vol. iii. pp. 455–458.

Replies to Mr. McMurtrie (see p. 24), describing some of the anticlinals and large faults, which account best for the inverted masses of Limestone in Somersetshire, referred to in *Geol. Mag.* 1871. W. H. D.

——. On the succession of strata in England and Wales, studied in connexion with geological time. (Norwich Geol. Soc.) *Eastern Daily Press*, Feb. 7.

Notes the breaks between the Pre-Cambrian and Cambrian, between the Cambrian and Silurian (of Sedgwick), between the Chalk and Tertiaries, and that between the Eocene and Pliocene, which is partly bridged over by the Miocene clays and lignites of Bovey Tracey; and observes that with these exceptions a complete sequence might locally be traced. Endeavours to show, by taking the mean calculations, that the total thickness of our strata is no more than 54,000 feet. Discusses the possible rate of deposition according to the limits of time assigned by Sir W. Thomson, and observes that we could not expect a succession of life-forms in a series of deposits which indicate continual changes of condition. H. B. W.

——. A Sketch of the Geology of Surrey. In 'The London Saturday Half-Holiday Guide.' Ed. 8, pp. 44–47.

Describes the Hastings Beds, Weald Clay, L. Greensand, Gault, U. Greensand, Chalk, Lower London Tertiaries, London Clay, Bagshot Beds, and Superficial Deposits, indicating localities, fossils, conditions of deposit, and relation of geological structure to scenery. W. H. D.

Worth, R. N. On Certain Alluvial Deposits associated with the Plymouth Limestone. *Quart. Journ. Geol. Soc.* vol. xxxii. pp. 236–239.

The deposits occur in "pockets" in the limestone; usually there are pebbles near the top and clay below, which again rests on sand. They are the remains of widespread deposits, which seem to have been formed in quiet water, and from decomposed granite. W. T.

——. The Geology of Plymouth. *Trans. Plymouth Inst.* vol. v. part 3, pp. 450–477.

Devonian rocks described in detail. Secondary rocks, Drift, and Cavern-deposits noticed.

Wright, Dr. T. Address to the Geological Section. *Rep. Brit. Assoc.* for 1875, *Sections*, pp. 47–62.

Gives a *résumé* of the Geology and Palæontology of the country round Bristol, divided into six districts:—Tortworth, Mendips, Radstock, Bristol, Dundry, and Bridgwater. W. T.

——. Note on the Reptilian Remains from the Dolomitic Conglomerate on Durdham Down. *Rep. Brit. Assoc.* for 1875, *Sections*, p. 85

Considers this conglomerate to be Triassic, and distinct from the deposits filling the fissures in the Carboniferous Limestone.

Wulff, J. Skotland under og efter Istiden. [Scotland during and after the Glacial Period]. After **J. Geikie.** *Tidskrift for populære Fremstillinger af Naturvidenskaberne.* Række 5, Häft 3.

Young, John. On a section of Lower Carboniferous Limestone Strata exposed at Sculliongour, on the North Hill of Campsie. *Proc. Nat. Hist. Soc. Glasg.* vol. ii. pt. ii. p. 219 (Abstract).

In the fissures of the limestone (which is overlain by shale and Boulder Clay) is peaty pulp, with many hazel-nuts, probably carried in by water, which freely traverses the beds. W. H. D.

——. Specimens Exhibited [and Remarks on them]. *Proc. Nat. Hist. Soc. Glasg.* vol. ii. pt. ii.

Pp. 197, 262. Carboniferous Limestone, Beith, Ayrshire, notes on section, glaciation, &c.

Pp. 216, 217. Black magnetic iron-sand from shore of Bute, with a non-magnetic iron-sand. ? Iserite or Ilmenite containing arsenic.

Pp. 254, 257. Carboniferous Limestone, E. Kilbride. List of fossils, some new. See **Prof. Young,** *post*, under INVERTEBRATA. W. H. D.

Catalogue of the Western Scottish Fossils. 8vo. *Glasgow.* Pp. xxiii, 164.

Prof. John Young. The Geology and Palæontology of the West of Scotland, pp. vii–xxiii.

James Armstrong, J. Young, and **D. Robertson.** Notes on the Rocks, and Catalogues of Fossils:—*Silurian*, pp. 1–28 (with 4 plates of Graptolites from Moffat); *Old Red Sandstone*, pp. 29, 30; *Carboniferous*, pp. 31–98; *Jurassic*, pp. 99–116; *Tertiary* (Leaf Beds of Mull), p. 117; *Post Tertiary*, pp. 118–156.

D. C. Glen and **J. Young, Jun.** List of Minerals and Rock Specimens, pp. 156–164. W. T.

Report by the Society's Boulder Committee. *Proc. R. Soc. Edin.* vol. ix. pp. 170–177, pls. ii., iii.

The third report. Several erratics are noticed, and some figured.

See also :—

Bobierre, —. Jersey Peat: p. 50.

Nicholson, Prof. H. A. Correlation of Graptolitic Deposits of Sweden and Britain: p. 99.

Penning, W. H. Field Geology: *post,* under APPLIED GEOLOGY.

2. *EUROPE.*

Abich, Prof. H. Ueber das geologische Alter der nordkaukasischen Jura-Kohlensandsteine und über in denselben vorkommenden natürlichen Salpeter im Kubanthale. [Age of the Jurassic Coal-sandstone in N. Caucasus and Saltpetre in the Cuban Valley.] *Bull. Ac. Imp. Sci. St.-Pétersb.* t. xxii. pp. 148–170.

Defines the age of the coal-beds as L. Oolite (Dogger), and gives analysis of saltpetre, by **Prof. C. Schmidt.**

Aitkin, John. The Dry River-beds of the Riviera. *Nature*, vol. xiv. pp. 148, 149.

Accounts for the size of the channels of the streams near Mentone, Vintimiglia, being out of proportion to the work done, by the heavy slopes and impermeable soil of the country causing a very rapid discharge of rainfall, great floods, and corresponding droughts. C. E. D.

Åkerblom, V. L. Bidrag till Tammerforstraktens geognosi. [Geology of the Neighbourhood of Tammerfors in Finland.] *Bidrag till kännedomen af Finlands natur och folk*, 20 häft, pp. 119–137.

A colour-printed geological map and sections show the distribution of the metamorphic and eruptive rocks, as well as of the Quaternary deposits, which are all briefly described. E. E.

Anon. [Exploratory Borings in Prussia in 1875.] *Zeitsch. Berg-, Hütt. Salinenw.* Bd. xxiv. p. 207.

The following trials have been carried on during the year:—At Bischofswerder, in W. Prussia, to a depth of 200 metres for lignite. Tertiary beds were found down to 190 mm., when the U. Cretaceous beds were reached. Südenburg, near Magdeburg, for coal; abandoned at 569 metres in schists apparently of the Culm series. Dakine, in Niederlausitz, for coal, reached 144 metres in Tertiary strata, including a lignite seam of 8 metres thickness. Cammin, in Pomerania, for the investigation of the Jurassic series, was in the shales of the Lias at 253 metres depth. Lieth, on the Lower Elbe, 1020 metres, without penetrating the Triassic red shales with rock-salt. H. B.

——. Geological Changes in Southern France. *Land and Water*, vol. xxii. no. 570, p. 473.

The French shore of the Mediterranean from Genoa to Marseilles is all life and beauty, while from Marseilles to the coast of Spain it is solitude and desolation. The latter once was highly prosperous; and Narbonne communicated direct with the sea in the time of the Romans; but since then quantities of sand and mud have accumulated, and ruined the ports. G. H. K.

Anon. Caves at Cravanche, near Belfort, France. *Nature*, vol. xiii. p. 456.

In Jurassic Limestone, between stalagmitic columns, vast quantities of human bones were found, associated with ornamental urns, polished flint weapons, and stone bracelets. C. E. R.

——. [**J. G. C.**] Corsican Mines. *Mining World*, vol. xi. pp. 568, 569.

Defines true lodes and contemporaneous deposits, compares Corsican and Prussian copper-ores, indicates a succession of upheavals affecting the Alps, &c., records recent fissuring, and refers to the finding of lodes by tracing boulders of ore to their source. W. H. D.

——. Cinquante-neuvième Session de la Société Helvétique des sciences naturelles réunie à Bâle les 21, 22, et 23 août 1876. [Meeting of Helvetic Soc. Nat. Sci. at Bâle, August 1876.] *Arch. Sci. Phys. Nat.* t. lvii. pp. 1–56.

The geological section is reported at pp. 18–26, with abstracts of papers by Messrs. Sandberger, Mühlberg, A. Favre, Rütimeyer, Fraas, Ch. Martins, Hagenbach, Greppin, Gross, Moesch, and K. Mayer. G. A. L.

——. [Discovery of good Coal at Déré-keuy, near Ismidt, in Turkey.] *Moniteur Industriel Belge*, vol. iii. p. 253. Note from '*La Turquie.*'

——. Ueber den Braunkohlen-Bergbau in Böhmen. [Brown Coal Mining in Bohemia.] *Prague.*

——. Geologische Tabellen und Durchschnitte über den grossen Gotthardtunnel. [Geological Plates and Sections across the St. Gothard Tunnel.] Fol. *Zurich.* 3 Lieferung. 1876.

Arcelin, —, and — Ducrot. Sur la stratigraphie de l'éboulis de Solutré. [Stratigraphy of the Landslip at Solutré.] *Bull. Soc. Anthrop. Paris*, sér. 2, t. xi. p. 486.

Armbruster, A. Notions géologiques appliquées au territoire de Belfort. [Elements of Geology applied to the Belfort District.] *Belfort.*

Arnaud, F. Ascension du Grand-Rubren. [Ascent of the Grand-Rubren.] *Ann. Club Alp. Franç.* 2 ann. Pp. 259.

Partly geological.

Arnaud, H. Profil géologique des falaises crétacées de la Gironde; étude comparative sur le Dordonien. [Section of the Cretaceous Cliffs of Gironde; a Comparative Study of the Dordonian.] Pp. 22, plate. *Bordeaux.*

Assier, A. d'. Les Eaux du Caucase et les Eaux des Pyrénées. [Pyrenean and Caucasian Springs.] *Rev. Sci.* xi. pp. 515–519.

Compares the Caucasus and Pyrenees as to their direction, geology, orientation of faults and fractures, &c. There is an analogy also between the mineral springs; the application of the theory that springs

of like age have a parallel direction has led to their successful exploitation in the Caucasus by M. François. E. B. T.

Aubaret, G. Province du Danube. [The Danube Province.] *Bull. Soc. Géogr. Paris*, 6 sér. t. xii. pp. 147–184.

A Consular Report. Mentions coal-workings near Dranova, not far from Sistova (p. 161), and near Plevna (p. 163), and at Travna (p. 165). Mineral springs near Vratza, and coal near Belgradjik (p. 172). Sulphurous waters in the Sofia district (p. 176). Iron is worked at Samakavo (p. 180). G. A. L.

Babánek, Fr. Berichtigung über das angebliche Vorkommen von Silurkalk-Geröllen im Heiligenberger Schachte bei Přibram. [Occurrence of Silurian Limestone Pebbles in the Heiligenberg Mine, near Přibram.] *Verh. k.-k. geol. Reichs.* p. 351.

Bachman, Dr. I. Geologisches über die Umgebung von Thun. [Geology of Thun District.] *Jahrb. Schweiz. Alpencl.* Jahrg. xi. pp. 371–413; folding section.

Describes the Tertiary, Cretaceous, Jurassic, and Trias of the Stockhorn, and the Nagelfluh (Miocene) of the Thun Valley.

Baltzer, Dr. A. Beiträge zur Geognosie der Schweizer-Alpen. [Contributions to the Geology of the Swiss Alps.] *N. Jahrb.* Heft ii. pp. 118–135, plate and woodcut.

A description of the *Glarnerschlinge*—a remarkable group of highly contorted rocks in Glarus. Eocene rocks, with nummulitic limestone, are for miles covered with Cretaceous, Jurassic, and other older rocks. This inversion is due to the complicated curves explained in a section from the Glärnisch, through the valley of the Linth to that of the Fore Rhine. The old rocks are thrown into a double-S shape of this character 2_S; and the younger rocks, themselves contorted, occupy the depression between the two extreme curves. A relation is traced between the readiness with which a rock yields to contorting forces and the proportion of alumina it contains. F. W. R.

Barbot de Marny, Prof. N. Die Fortschritte der geologischen Beschreibung Russlands in den Jahren 1873 und 1874. [Progress of Russian Geology in 1873–74.] Pp. 67. *St. Petersburg.*

Barrois, Ch. Le Gault dans le bassin de Paris. [Gault of the Paris Basin.] *Bull. Soc. Géol. France*, 3 sér. t. iii. pp. 707–714.

Divides the Gault of this area into three zones, of *Ammonites mammillaris*, of *Amm. interruptus*, and of *Amm. inflatus*. Of 315 species found in these beds, only 22 are common to all three. His zone of *Amm. inflatus*, including the Gaize of Argonne and the uppermost clay of Wissant, corresponds with the U. Gault of Swiss geologists. A list is given of the fossils obtained from these localities, and they are compared with the faunas of Cambridge and Folkestone. The zone of *Amm. interruptus* is the Albian of D'Orbigny.

The zone of *Amm. mammillaris* is correlated with the "*grès verts*

durs" of Ste. Croix, and with the upper sands of the Folkestone beds. (See GEOLOGICAL RECORD for 1875, p. 49.) A. J. J-B.

Barrois, Ch. L'Éocène supérieur des Flandres. [Upper Eocene of Flanders.] *Ann. Soc. Géol. Nord*, t. iii. pp. 84–87.

It has been shown that the clayey greensand of Cassel is U. Lackenian; between this and the Diestian are some reddish-yellow sands, the *Sables chamois*, which have been referred to the Miocene, but which M. Ortlieb believes to have been deposited before the upheaval which introduced the upper fossiliferous Eocene. This view is confirmed by comparing the beds with those of the London Basin, where similar sands (U. Bagshot) lie between the M. Bagshot (or *Calcaire Grossier*) and the Iron sands which are probably Diestian; in both areas also the marine Barton Beds are absent. A. J. J-B.

Baye, J. de. Grottes de la Vallée du Petit-Morin. [Caves of the Petit-Morin Valley (Marne).] *Tours* and *Paris*.

——. Les grottes à sculptures de la Vallée du Petit-Morin (Marne). [Caves with sculptures of the Petit-Morin Valley.] *Tours* and *Paris*.

——. Notice sur les grottes préhistoriques de la Marne. [Account of the prehistoric caves of the Marne.] *Tours* and *Paris*.

These three are short notices.

Behrens, C. [Parlow Chalk.] *Zeitsch. deutsch. geol. Ges.* Bd. xxviii. Heft 3, p. 622.

Notices the discovery of *Belemnitella quadrata*, &c. in Chalk of Parlow and Trebenow; the beds are there older than the Rügen, and newer than the Lebbin beds. E. B. T.

Belgrand, —, and G. Lemoine. Observations sur les cours d'eau et la pluie centralisées pendant l'année 1875. [Water-courses and Rainfall in the Basin of the Seine in 1875.] Fol. 8 pls. *Ministry of Public Works. Versailles.* Also a *résumé* of the above by **M. Belgrand.** 8vo. Pp. 62. *Versailles.*

Refers to the geological bearings of the subject.

Benecke, Dr. E. W. Ueber die Umgebungen von Esino in der Lombardei. [Neighbourhood of Esino, Lombardy.] *Benecke's Geogn.-pal. Beiträge*, Bd. ii. Heft 3, pp. 257–295, plates 21 (map and section); also noticed in *Boll. R. Com. geol. Ital.* vii. pp. 506, 507.

Notices Von Hauer's original opinion that the Esino fossils were of the age of the Hallstadt and below the Raibl beds. Stoppani first placed them above the latter; but, owing to researches by Curioni, this opinion was modified. Curioni showed that at Esino a limestone series existed below the Raibl; and this he considered of the age of the Hallstadt beds; while in other parts of Lombardy were fossiliferous limestones above the Raibl beds, and from this latter horizon he conceived the Esino fossils

to come. The present contribution shows that the rich fossiliferous beds of Piz di Cainallo near Esino, containing numerous bivalves, *Stomatia Cainalli*, *Ostræa stomatia*, *Diplopora annulata*, &c., are the same as those of Sasso Mattolino, acknowledged to be below the Raibl beds, these being identified by several of the fossils being common to both. The Val di Monte, near Esino, rich in *Chemnitziæ*, is next considered: it is held that the beds here are also below the Raibl beds, but dipping in the opposite way to those N. of the village, the position being a synclinal with a fracture. It is said that no beds containing the Esino fauna exist in Lombardy above the Raibl beds. Beds with *Avicula exilis* and *Gyroporella vesicularis* from other districts belong to a higher horizon ["Dachstein"], being above the Raibl beds: these two fossils probably do not occur at Esino. E. B. T.

Benecke, Dr. E. W. Die geologische Stellung des Esino-Kalkes. [Geological Position of the Esino Limestone.] *Verh. k.-k. geol. Reichs.* pp. 308–311.

Summarizes the results given in the foregoing abstract.

Beneden, Prof. P. J. Van. [Report on M. Mourlon's paper "Sur les dépôts qui, aux environs d'Anvers, séparent les sables noirs miocènes des couches pliocènes scaldisiennes."] *Bull. Ac. R. Belg.* sér. 2, t. xlii. pp. 666–668. (See **Mourlon**, p. 97.)

Berendt, G. Notizen aus dem Russischen Grenzgebiete nördlich der Memel. [Notes from the Russian frontier N. of Memel.] *Zeitsch. deutsch. geol. Ges.* Bd. xxviii. Heft 1, pp. 64–68.

Note to prove that certain patches mapped as Devonian, &c., near the Russian boundary, are not rocks in place, but erratics which have yielded many fossils of this age. E. B. T.

——. [Purmallen Boring.] *Zeitsch. deutsch. geol. Ges.* Bd. xxviii. Heft 4, p. 775.

This boring, near Memel, passed through Drift 70 metres, Greensand 6 metres, Oxford Clay 84 metres, and was then in Oolitic cellular limestones. E. B. T.

Beyrich, Prof. [On the Kissingen District.] *Zeitsch. deutsch. geol. Ges.* Bd. xxviii. Heft 3, p. 628.

Notices a boring 2000 ft. deep which reaches the Zechstein, passing through M. and L. Bunter: basalts cover isolated patches of Muschelkalk, &c., having broken irregularly through the Bunter, probably in Miocene times. E. B. T.

Beyrich, E., and **F. Moesta.** Blatt Sontra. [Sontra Sheet.] *Erläut. geol. Spezialkarte Preuss.* Gradabth. 55, no. 58, pp. 35, pls. 29, 30 (maps).

Describes Permian, Triassic, Tertiary, and Recent beds.

Bianconi, G. G. Considerazioni sul deposito di rame di Bisano. [Copper-deposit of Bisano.] Pp. 17. Bologna.

Bobierre, —. [Marine Peat.] *Compte rendu des travaux du laboratoire de chimie agricole de la Loire-Inférieure*, 1850–1875. Abstract in *Rev. Géol.* in *Ann. Mines*, sér. vii. t. x. pp. 469, 470.

Account of large beds of peat formed of sea-weed and covered by 3 feet of soil at Sarzeau and at Téven in the Seine-Inférieure, at three localities in Morbihan and Finistère, and in Jersey. Analyses of peat from the French deposits are given. G. A. L.

Bölsche, Dr. —. *N. Jahrb.* Heft ix. p. 924.

Notes the discovery of marl-slates, belonging to the *Coronatus*-zone, near Wittlage, in Essen.

Bogdanow, Modeste. Quelques mots sur l'histoire de la faune de la Russie d'Europe. [History of the Russian Fauna.] *Arch. Sci. Phys. Nat.* t. lvi. pp. 22–31.

Defines the Area of Erratics in Russia.

Bone, Dr. Carl. Das Plateau von Ferschweiler bei Echternach, etc. [The Ferschweiler Plateau near Echternach.] *Trier.*

Contains geological notes.

Boucheporn, — de. Explication de la carte géologique du département de la Corrèze. [Explanation of the Geological Map of the Corrèze.] 12mo. *Tulle.* (See *post*, under "Maps.")

Boué, Dr. A. Notiz über Dolomisation, Serpentin, oder eigentlich über die Genesis der Bittererde- oder Magnesia-Anhäufung in gewissen Felsarten. [Dolomite, Serpentine, &c. in certain Rocks.] *Sitz. k. Ak. Wiss. Wien, math.-nat. Cl.* Abth. i. Bd. lxxiv. Heft 2, pp. 266, 267.

Notices the occurrence of serpentine, flanked by talcose schist, in the midst of Cretaceous sandstones, in Epirus and Peloponnesus, and asks for a solution of the question, Is the serpentine derived by metamorphosis from an olivine-rock? E. B. T.

Boulay, —. Le terrain houiller du Nord de la France et ses Végétaux fossiles. [The Coal Measures of N. France and their Fossil Plants.] Pp. 54. 4to. *Lille.* A thesis for the degree of D.Sc.

Boutillier, Louis. Note sur un dépôt d'objets organiques et d'objets de fabrication humaine aux environs de Jarnac (Charente). [Deposit of Organic Remains and of Objects of Human Manufacture near Jarnac.] *Bull. Soc. Géol. France*, 3 sér. t. iv. pp. 28–30.

The deposit, 100 kilometres from and 40 metres above the sea, is a few inches thick, and consists of marine shells, with fragments of pottery and iron nails. Beneath this remains of Gallo-Roman buildings

have been found. The author rejects the idea that we have here any thing analogous to a kitchen-midden, but believes that the débris was brought together by a "formidable marine current, the result of an accidental and sudden oscillation of the land," which spread temporarily only over the district. G. A. L.

Braun, Max. [Geology of Portugal.] *N. Jahrb.* Heft v. pp. 535–539.
Geological notes, with mineralogical observations at certain mines.

Brauns, Dr. D. Die senonen Mergel des Salzberges bei Quedlinburg und ihre organische Einschlüsse. [Quedlinburg Marl, &c.] *Zeitsch. gesammt. Nat.* Bd. xlvi. pp. 325–420, pls. 7–10.
Enumerates 163 species, excluding numerous synonyms; compares the fauna with that of beds in N. Germany, Hanover, &c. The results show the Salzberg marls to be the base of the Senonian, just above the equivalents of the Ems marls. The new species described are *Scaphites Roemeri*, *Capsula bicarinata*, and *Isoarca hercynica*. E. B. T.

Breitenlohner, Dr. Ueber Menge und Bestand der bei Lobositz durch die Elbe aus Böhmen entführten suspendirten und gelösten Stoffe nach monatsweisen Beobachtungen im Jahre 1866. [The Amount of Matter carried out of Bohemia in suspension by the Elbe at Lobositz.] *Verh. k.-k. geol. Reichs.* pp. 172–176.

Briart, A. Compte-rendu de l'excursion du 4 Septembre à Élouges, Angre, Autreppe, et Montignies-sur-Roc. [Excursion to Élouges, Angre, &c.] *Bull. Soc. Géol. France*, sér. 3, t. ii. pp. 626–630, woodcut in text.
Excursion-notes, with short lists of fossils.

——. [Report on **M. Mourlon's** paper "Sur les dépôts dévoniens rapportés par Dumont à l'étage quartzo-schisteux inférieur de son système eifélien, &c."] *Bull. Ac. R. Belg.* sér. 2, t. xli. pp. 230, 231. (See **Mourlon**, p. 97.)

Brocchi, Prof. P. La Société géologique en Suisse et en Savoie. [The Geological Society (of France) in Switzerland and Savoy.] *Ann. Club Alp. France*, 2 ann. p. 668.
Résumé of geological excursions.

Brögger, W. C., and H. H. Reusch. Pochi appunti sull' Isola d'Elba. [Notes on Elba.] *Boll. R. Com. geol. Ital.* vii. pp. 223–227.
The W. of the island consists of granite, in which are mineral veins with a N.E.–S.W. course: the middle tract is occupied by "macigno," in which occur Flysch fossils; it is traversed by quartziferous porphyry dykes. The E. end and higher part of the island consist of older schists, in which are the iron-mines: though connected with augitic rock, it is held that the ores themselves are not of eruptive nature. The case is paralleled with that of Arendal. E. B. T.

Bruno, Walter. Die Erzlagerstätten der südlichen Bukowina. [Ore-deposits of S. Bukowina.] *Verh. k.-k. geol. Reichs.* p. 237.
Preliminary abstract of a memoir to be printed in the *Jahrbuch.*

Caillaux, Alf. Note sur la découverte de minerai d'étain en Toscane. [Tin in Tuscany.] *Bull. Soc. Géol. France,* 3 sér. t. iv. pp. 293–295.
Note of the discovery of cassiterite, associated with iron-ore, at the Cento Camerelle, near Campiglia Marittima, in limestone, supposed by Italian geologists to be Liassic or Infra-Liassic. Granite, however, is known not far from this locality. Two analyses are given, the percentages of metallic tin being 58·9 and 72. G. A. L.

Canat, J. Bancs stratifiés de silex massif observés auprès de Digoin (Saône-et-Loire) dans un terrain considéré comme crétacé. [Massive Stratified Silica near Digoin in supposed Cretaceous Beds.] *Compt. Rend.* t. lxxxiii. p. 459.

Capellini, Prof. G. Sui terreni terziari di una parte del versante settentrionale dell' Apennino. [Tertiaries N. of the Apennines.] *Mem. Ac. Bologna,* ser. 3, t. vi. pp. 587–622, plate. Noticed in *Boll. R. Com. geol. Ital.* vii. pp. 347, 348.
In answer to T. Fuchs. [See Geological Record for 1875, p. 64.]

——. L'Uomo Pliocenico in Toscana. [Pliocene Man in Tuscany.] *Atti R. Ac. Linc.* ser. 2, t. iii. p. 17, pls. i.–iv. (cut bones and sections across the Fine Valley).

Cessac, — de. Sur des fouilles à Santorin. [Excavations at Santorin.] *Bull. Soc. Anthrop. Paris,* sér. 2, t. xi. p. 127.

Chambrun de Rosemont, — de. Considérations sur le delta du Var. Suites des Études géologiques sur le Var et le Rhône pendant les périodes tertiaires et quaternaires. [Delta of the Var.] Pp. 15. *Nice.* [See Geological Record for 1874 and 1875.]

Chancourtois, — de. Observations sur l'exploration géologique du Pas-de-Calais et sur la question du Tunnel. [Geological Survey of the Straits of Dover and the Tunnel Question.] *Bull. Soc. Géol. France,* 3 sér. t. iv. pp. 61–67.
Applies a system, allied to the Pentagonal Network of Élie de Beaumont, to the determination of the folds, faults, and fissures probably to be met with in constructing the Channel Tunnel. G. A. L.

Chantre, E., and — Lartet. Le bassin du Rhône à l'époque quaternaire. [Basin of the Rhone in Quaternary Times.] *Rev. Sci.* t. x. pp. 361–369.
Describes the Glacial Drift between Lyons and the Alps, and the

climate then prevailing. Gives an account of the Glacial vertebrate fauna of the district. E. B. T.

Chellonneix, Emile. Couches Landéniennes au pied des Noires-Mottes, et disposition des grès Diestiens dans les mêmes buttes. [Landenian at the Foot of the Noires-Mottes, and Position of the Diestian Sandstones in those Hillocks.] *Ann. Soc. Géol. Nord*, t. iii. pp. 20, 21.

The Noires-Mottes are three hillocks situated on the N.E. flank of Cape Blanc-Nez.

Chellonneix, Emile, and **Gustave Lecocq.** Observations sur les environs de Tourcoing. [The Country round Tourcoing.] *Ann. Soc. Géol. Nord*, t. iii. pp. 26–29.

A continuation of records of local sections. See Geological Record for 1875, p. 385.

Choffat, P. Sur les couches à *Ammonites acanthicus* dans le Jura occidental. [The *Amm. acanthicus* Beds in the W. Jura.] *Bull. Soc. Géol. France*, 3 sér. t. iii. pp. 764–773, folding table, figure in text.

Compares in detail the species found in these beds at Porrentruy, Laegern, and Wangen.

Christ, Dr. H. Die Unterwaldner Alpen. [Unterwald Alps.] *Jahrb. Schweiz. Alpencl.* Jahrg. xi. pp. 3–44; 3 views.

Touches on the geology (Jurassic, Cretaceous, Eocene, and Drift).

Colladon, D. Terrasses lacustres du lac Léman, et constitution de la terrasse d'alluvion sur laquelle est construite la ville de Genève. [Terraces of the Lake of Geneva and Alluvial Terrace of the Town.] *Bull. Soc. Géol. France*, 3 sér. t. iii. pp. 661–668.

Torrent-deltas are composed of oblique layers of coarse material capped with a horizontally bedded mass, the surface of which indicates the level of the lake at the time of deposition. W. H. D.

Collenot, —. Rectification à la Description géologique de l'Auxois en ce qui concerne le deuxième Étage du groupe oolitique inférieur, suivie de la Description des vestiges erratiques aux environs de Laroche-Vanneau, près Flavigny. [Correction of the Geological Description of Auxois relating to the second division of the L. Oolite, with a description of the traces of Erratics in the neighbourhood of Laroche-Vanneau.] Pp. 15, plate. *Semur.*

Coquand, Prof. H. Découverte de la Craie blanche d'origine marine dans la Provence. [Discovery of Marine White Chalk in Provence.] *Bull. Soc. Géol. France*, 3 sér. t. iii. pp. 599–601.

Records the discovery of White Chalk near Sontis and in the Commune of Beynes. This chalk contains *Ostrea vesicularis* (Meudon type), *O. Matheroni*, and fragments of Belemnites (*Belemnitella*?) and *Anan-*

chytes, thus proving it to be above the *Micraster cortestudinarum* horizon. G. A. L.

Coquand, Prof. H. Note sur les calcaires coralliens à *Terebratula Repelliniana* de la Basse-Provence et du Languedoc. [Corallian Limestones with *T. Repelliniana* in Basse-Provence and Languedoc.] *Bull. Soc. Géol. France*, 3 sér. t. iii. pp. 670–686.

History of the controversy as to the age of this horizon, with evidence of its position in the Astartian. *Terebratula janitor* is shown to be a Jurassic species. W. H. D.

——. Complément à la note intitulée: "Un dernier mot sur les calcaires coralliens à *Terebratula Repelliniana*." [Corallian Limestones with *T. Repelliniana*.] *Bull. Soc. Géol. France*, 3 sér. t. iii. pp. 756–763.

Claims that the deposits at Lémenc and Salève prove his views, shared by M. Lory since 1866, to be correct.

——. Histoire des Terrains stratifiés de l'Italie centrale, se référant aux périodes primaire, paléozoïque, triasique, rhétienne et jurassique. [Sedimentary Rocks of Central Italy from the oldest to the Jurassic.] *Bull. Soc. Géol. France*, 3 sér. t. iv. pp. 126–150.

The second part of the memoir (see GEOLOGICAL RECORD for 1875, p. 55). Maintains his position as regards the Carboniferous Limestone age of the Campigliese and Apuan Alps marbles. Compares these rocks with those similarly circumstanced in Algeria, Greece, the Pyrences, the Montagne Noire, the departments of Allier, Cantal, and Loire, Turkey and Asia Minor, Corsica, and the Tanaro Alps in Piedmont, and in most of these cases comes to the same conclusion. G. A. L.

——. Sur l'exploitation des mines du Campigliese par les anciens Étrusques. [Working of the Campigliese Mines by the Ancient Etruscans.] *Bull. Soc. Géol. France*, 3 sér. t. iv. pp. 150–159.

An archæological paper with geological notes.

Cornet, —. [Report on **M. Mourlon's** paper (see p. 97), "Sur le dépôts dévoniens rapportés par Dumont à l'étage quartzo-schisteux inférieur de son système eifélien, etc.] *Bull. Ac. R. Belg.* sér. 2, t. xli. pp. 232–240.

Cornet, —, and — Briart. Notice sur l'accident qui affecte l'allure du terrain houiller entre Boussu et Onnaing. [The Causes affecting the Lie of the Coal Measures between Boussu and Onnaing.] *Ann. Soc. Géol. Nord*, t. iii. pp. 138–144.

In this locality the Coal Measures lie regularly beneath reversed Devonian beds. This has been explained in many ways. It is now shown to be due to three great faults, known respectively as the "faille du Midi" (southern fault), the "cran de retour," and the Boussu fault.

The mode in which the complicated arrangement took place in five stages or phases is described. G. A. L.

Cossigny, — de. Note sur le terrain crétacé de la partie méridionale du bassin de Paris et sur l'argile à silex d'Allogny (Cher), et considérations géologiques générales à propos de ces terrains. [Cretaceous Beds of the S. of the Paris Basin and the Clay with Flints of Allogny (Cher).] *Bull. Soc. Géol. France*, 3 sér. t. iv. pp. 230–258, plate iv.

Regards the clay with flints of Allogny as the oldest Tertiary deposit in the Paris Basin. Believes that the origin of this great accumulation of flints is due not to chemical but to mechanical means—probably to an immense glacier. Refers to many other matters more or less connected with the subject. G. A. L.

Coste, Dr. —. Dépôts glaciaires à Salins. [Glacial Deposits at Salins.] *Rev. géol.* in *Ann. Mines*, sér. 7, t. x. p. 585.

Note of occurrence.

Cotteau, G. La Société géologique de France à Chambéry, à Genève et à Chamonix ; la Société Helvétique à Andermatt (Session de 1875). [The French Geol. Soc. at Chambéry, &c. ; and the Helvetic Soc. at Andermatt.] *Bull. Soc. Sci. Hist. Nat. Yonne*, 2 sér. t. ix. p. 137.

Credner, G. R. Das Grünschiefersystem von Hainichen im Königreich Sachsen. [Green Slate Series of Hainich, Saxony.] *Zeitsch. gesammt. Nat.* n. F. Bd. xiii. pp. 117–245, pls. iii., iv. (sections).

Divides the series into 4 zones, Horn-slates, Banded Green-slates, True Green-slates, and Green-slate breccia, the last covered unconformably by Culm-conglomerate. Describes every variety of rock in the series, giving many analyses. W. H. D.

Credner, Dr. Hermann. Ueber Lössablagerungen an der Zschopau und Freiberger Mulde, nebst einigen Bemerkungen über die Gliederung des Quartär im südlichen Hügellande Sachsens. [The Loess of the Zschopau and Freiberg Basins, with Remarks on the Classification of the Quaternary Deposits in the S. Hill-country of Saxony.] *N. Jahrb.* Heft i. pp. 9–23.

Describes special sections of the Drift in parts of Saxony, and correlates the subdivisions with those in Thuringia and the Hartz. Recognizes (1) "older diluvium," consisting of gravels and sands on the high plateaux ; (2) "younger diluvium," deposited after erosion of valleys in the former and consisting of loess now on the sides of the river-valleys ; and (3) "alluvium" of horizontally-deposited loam and river-gravels in the bottom of the existing valleys. F. W. R.

——. Septarienthon mit *Leda Deshayesiana* bei Leipzig. [Septarian Clay with *L. Deshayesiana* near Leipzig.] *N. Jahrb.* Heft i. p. 45.

Announces the discovery of this clay in a boring for lignite near

Gautzsch. Only one other occurrence of marine Tertiary fossils in Saxony is known. F. W. R.

Credner, Dr. Hermann. Die Küstenfacies des Diluviums in der sächsischen Lausitz. [Coast-facies of the Drift in Saxon Lusatia.] *Zeitsch. deutsch. geol. Ges.* Bd. xxviii. Heft 1, pp. 133–158.

Describes Drift phenomena of the southernmost point in Lusatia to which Drift reaches. It is found at a height of 400 metres above sea-level, and consists largely of shingle of local rocks, in contrast with that of the N. German plain, which consists of loam with erratics of Scandinavian origin. In Lower Lusatia the Drift partakes of the latter character. E. B. T.

Czerski, F. von. Zur Frage über das Alter der in den Umgebungen von Omsk vorkommenden Schichten. [Age of Beds near Omsk.] *Zeitsch. deutsch. geol. Ges.* Bd. xxviii. Heft 2, pp. 217–224, tab. 5 (sketch map).

Notices the occurrence of 2 species of *Unio*, which prove the existence of the Miocene; the upper beds (Post-Pliocene) are also freshwater.

Czoernig, C. v. Ueber die in der Grafschaft Görz seit Römerzeiten vorgekommenen Veränderungen der Flussläufe. [Changes in the River-courses of Görz since Roman Times.]. *Vienna.*

Dale, T. N. A Study of the Rhætic Strata of the Val di Ledro, in the Southern Tyrol. 69 pp., 8 plates (geological map, sections, &c.), 1 table. 8vo. *New York.*

Noticed in *Nature*; also in *Boll. R. Com. geol. Ital.* vii. pp. 440–442.

Debray, Henri. Observation faite au Mont des Récollets. [Fact observed at the Mont des Récollets.] *Ann. Soc. Géol. Nord*, t. iii. pp. 17, 18, figure in text.

Note of a fault.

——. Forages à Merville, à Thumesnil et à Hermies. [Borings near Lille.] *Ann. Soc. Géol. Nord*, t. iii. p. 22.

The Merville boring reached Chalk at 89 metres, that of Thumesnil proved Tournai stone at 66 m.; and at Hermies marls with *Terebratula gracilis* were struck at 64 m. A section of the first boring is given. G. A. L.

——. Note sur le terrain récent des Communes de Calais et de Marck. [Recent Deposits of the Communes of Calais and Marck.] *Ann. Soc. Géol. Nord*, t. iii. pp. 29, 30.

Two sections of railway-cuttings. The occurrence of Gallo-Roman pottery about 3 metres above sea-level makes the author think that it was brought by the waves of the sea. In the discussion **Prof. Gosselet** differs, and thinks that in Gallo-Roman times Marck may have been dry land when St. Omer was under the sea. G. A. L.

——. Sur le terrain récent entre Bourbourg et Dunkerque. [Recent

Deposits between Bourbourg and Dunkirk.] *Ann. Soc. Géol. Nord*, t. iii. pp. 88, 89.

Gives a section at Mardyck gracht (clay, peats, and sandy clays), where remains of whales have been found, a little below the mean sea-level at Calais. G. A. L.

Debray, Henri. Forage à La Madeleine-lez-Lille. [Boring near Lille.] *Ann. Soc. Géol. Nord*, t. iii. pp. 152, 153.

Gives a section of a boring reaching Chalk at 33 metres.

Deichmann-Brauth, J. S. Hvorfra og hvorledes ere Stenene i det nordlige Jylland komme? [Whence and how have the stones in Northern Jylland come?] *Tidskrift for populære Fremstillinger af Naturvidenskaberne*, Række 5, Bd. 3. *Kjöbenhavn.*

Delage, —. Profil géologique du chemin de fer de Rennes à Redon. [Geological Section of the Railway from Rennes to Redon.] *Bull. Soc. Géol. France*, 3 sér. t. iv. pp. 226–230, pl. iii.

The line follows the course of the River Vilaine. The rocks cut by it are as follows, in ascending order:—Silurian (Rennes schists, red schists with intercalated conglomerate, bilobite grits, slates with intercalated grits and conglomerate, fissile sandstone); Miocene of Lormandière and Langon. The plate gives the complete section. G. A. L.

Delaire, Al. Genève et le Mont Blanc. Notes de science et de voyage. [Geneva and Mt. Blanc.] 69 pp. *Paris.*

Contains geological notes.

Delesse, Prof. Achille. Rapport sur la Carte agronomique et hydrologique du département du Tarn-et-Garonne. [Report on the Agricultural and Hydrological Map of Tarn-et-Garonne.] *Mém. Soc. centr. Agric. France*, t. i. p. 133.

Delgado, J. F. N. Sobre a existencia do terreno siluriano no Baixo Alemtejo. [Occurrence of Silurian Rocks.] With French translation. 40 pp., map, and 4 plates. 4to. *Lisbon.*

Delille, Fr. Sur un gisement de Coquilles fossiles du Diluvium dans la presqu'île de Saint-Maur (Seine). [Shell-bed of the Drift in the Peninsula of Saint Maur (Seine).] *Bull. Soc. Géol. France*, 3 sér. t. iv. pp. 360, 361.

The bed on the right bank of the Marne, 400 metres from the bridge at Champigny, contains a great number of land and freshwater shells. It is analogous to deposits at Joinville-le-Pont and Gentilly. G. A. L.

Delplanque, —. Coupe de la partie supérieure de la fosse No. 5 de la Compagnie de l'Escarpelle, près Douai. [Section of the Upper Part of No. 5 pit of the Escarpelle Colliery, near Douai.] *Ann. Soc. Géol. Nord*, t. iii. pp. 31, 32.

A section from the surface to the Chalk.

Descostes, F. Le val de Fier. [The Fier Valley.] *Ann. Club Alp. Franç.* 2 ann. p. 119.
Partly geological.

Désor, Prof. E. Controverse glaciaire. [Glacial controversy.] *Arch. Sci. Phys. Nat.* t. lvii. pp. 253–277.
Answers objections against the theory that the ancient glaciers flowed from the face of the Alps into the Subapennine or Pliocene sea.

——. Le Sondage de Rheinfelden. [The Rheinfelden Boring.] *Journal de Genève*, 15 January.

——. Report of Deep-boring at Rheinfelden, on the Swiss shore of the Rhine. *Nature*, vol. xv. p. 128.
Stopped at a depth of 1422 feet, after penetrating Dyas and 200 feet of granite and diorite, without finding the expected Coal Measures.

Dewalque, Prof. G. Note sur le dépôt scaldisien des environs d'Herenthals. [Scaldisian Beds near Herenthals.] *Ann. Soc. Géol. Belg.* t. iii. pp. 7–11.
Describes the ferruginous sands worked in this district, confirms the view that they are Scaldisian, and gives lists of fossils (casts only).

——. Note sur quelques localités pliocènes de la rive gauche de l'Escaut. [Pliocene Localities on the Left Bank of the Scheldt.] *Ann. Soc. Géol. Belg.* t. iii. pp. 12–20, fig. in text.
The localities described are Burgt, Cruybeke, and Zwyndrecht. At the last a case of change in colour of deposits, having no relation with the lines of bedding, is noted as an example of the danger of basing stratigraphical subdivisions on colour. Lists of fossils are given.
G. A. L.

——. À propos de la carte géologique de la Belgique. [Remarks with reference to the detailed Geological Map of Belgium.] *Bull. Ac. R. Belg.* sér. 2, t. xli. pp. 13–27.
A reply to attacks by **M. Dupont**, a vindication of proceedings with regard to Dumont's geological map and manuscript notes, and a statement of views on the proposed large-scale geological map of Belgium, and the methods to be followed in drawing it up. G. A. L.

——. Sur les manuscrits d'André Dumont et les commentaires de M. Éd. Dupont. [Dumont's MSS. and M. Dupont's Remarks.] *Bull. Ac. R. Belg.* sér. 2, t. xlii. pp. 97–103.
Shows that the extracts from the MSS. printed by M. Dupont, as a proof of the value which the notes would have if printed without delay, prove how great is the amount of editing, and consequently time, which they will require. G. A. L.

Dewalque, Prof. G. Rapport sur le complément du Mémoire couronné de MM. de la Vallée-Poussin et Renard sur les roches plutoniennes de la Belgique. [Report on the Supplement to Messrs. de la Vallée-Poussin and Renard's Prize Memoir on the Plutonic Rocks of Belgium.] *Bull. Ac. R. Belg.* sér. 2, t. xli. pp. 407–430.

Gives an analysis of the final part of this work. G. A. L.

Didelot, —. Compte rendu sommaire de l'excursion . . . . . à la montagne des Voirons. [Excursion to the Voirons.] *Bull. Soc. Géol. France*, 3 sér. t. iii. pp. 669, 670, pl. xxv. fig. 1 (section).

Doelter, Dr. C. Il gruppo vulcanico delle Isole Ponza: monografia geologica. [Geology of the Ponza Isles.] *Mem. R. Com. geol. Ital.* iii. part i. pp. 1–43, pls. 1–4 (geol. map & section); *Denkschr. k. Ak. Wiss.* xxxvi. [See GEOLOGICAL RECORD for 1875, p. 59.]

The island of Zannone shows schists and limestone probably Palæozoic. Ventotene contains enclosed in the tuffs fragments of granite, syenite, diorite, green schists, &c.; these facts point to a submarine connection between the islands and the Ligurian Alps. The time of volcanic activity was probably the end of the Tertiary period. E. B. T.

——. Das Porphyrterrain im Fleimserthal. [Fleimserthal Porphyries.] *Verh. k.-k. geol. Reichs.* pp. 150, 151.

Explanation of the geological map of this district.

Dollfus, Gustave. Sur une nouvelle coupe observée à Rilly-la-Montagne, près Reims (Marne). [New Section at Rilly.] *Ann. Soc. Géol. Nord*, t. iii. pp. 153–173; 3 figs. in text.

Gives a number of detailed sections, with lists of fossils, illustrating the mode of occurrence and geological position of the Rilly beds, which are considered as the continental equivalent, in part, of the marine Bracheux sands (M. Eocene) of the Paris Basin. A table shows the synchronism of the Eocene divisions in the Paris, Flemish, and Hesbayean Basins. G. A. L.

Douvillé, —. Note sur la constitution du terrain tertiaire dans une partie du Gatinais et de l'Orléanais. [Tertiary Beds of Part of the Gatinais and the Orléanais.] *Bull. Soc. Géol. France*, 3 sér. t. iv. pp. 91–104, pl. ii.

Describes sections in the Loiret, between Orleans, Montargis, and Gien, and determines the following horizons in the Tertiary rocks of the district:—1. Upper Clays and Sands; 2. White and Green Marls; 3. Middle Clays and Sands; 4. Upper Limestone; 5. Lower Clays and Sands; 6. Lower Limestone. These were formerly grouped in two divisions, "Calcaire de Beauce" and "Argiles et Sables de la Sologne." G. A. L.

——. Note sur le Système du Sancerrois et le terrain sidérolithique du Berry. [The Sancerrois System of Upheaval and the Siderolitic Deposits of Berry.] *Bull. Soc. Géol. France*, 3 sér. t. iv. pp. 104–110.

The faults of the Sancerrois line of dislocation are newer than both

the clay with flints and the lacustrine limestone of Berry. The latter is not, as was supposed, the equivalent of the Beauce limestone, but belongs to the Siderolitic series. A table is given correlating these deposits in the Paris Basin and in that of the Loire and the Central Plateau, and showing the relationship between their marine and lacustrine faunas. G. A. L.

Dulignon-Desgranges. Excursion sur le littoral de Gascogne. [Excursion on the Gascony Coast.] *Act. Soc. Linn. Bordeaux*, sér. 4, t. i. pp. 41–60.

Notices sections, &c., chiefly with reference to Prehistoric Stations.

Dumas, E. Statistique géologique, minéralogique, métallurgique et paléontologique du département du Gard. [Geology, mineralogy, metallurgy, and palæontology of the Gard.] 2 vols. Pp 284, 735. 9 plates. *Paris*, *Nîmes*, and *Alais*.

Dupont, E. Note sur les principaux Manuscrits délaissés par feu André Dumont. [Note on the chief MSS. left by Dumont.] *Bull. Ac. R. Belg.* sér. 2, t. xli. pp. 458–471, fig. in text.

These MSS. consist of 12 volumes. i. to iv., description of the Cretaceous, Tertiary, and Quaternary deposits of Belgium; v. to x., field-notes, no less than 20,917 entries; xi. and xii., lists of fossils of the Devonian, Carboniferous Limestone, and Tertiary series of the country. The writer quotes notes referring to Mont Panisel, near Mons, as a specimen, and urges their publication. G. A. L.

——. [Note of occurrence of Palæolithic remains near Hastières-sur-Meuse.] *Bull. Ac. R. Belg.* sér. 2, t. xlii. pp. 489, 490.

——. [Report on M. Mourlon's paper "Sur les dépots qui, aux environs d'Anvers, séparent les sables noirs miocènes des couches pliocènes scaldisiennes."] *Bull. Ac. R. Belg.* sér. 2, t. xlii. pp. 669–674. (See **Mourlon**, p. 97.)

——. [Report on M. Mourlon's paper "Sur l'étage dévonien des psammites du Condroz dans la vallée de la Meuse entre Lustin et Hermeton-sur-Meuse."] *Bull. Ac. R. Belg.* sér. 2, t. xlii. pp. 831–835.

——. Théorie des âges de la pierre en Belgique. [Theory of the Stone Ages in Belgium.] *Bull. Soc. Anthrop. Paris*, 2 sér. t. ix. no. 6, p. 728.

Ébray, Th. Étude stratigraphique des montagnes situées entre Genève et le Mont-Blanc. [Stratigraphical Researches between Geneva and Mt. Blanc.] *Bull. Soc. Géol. France*, 3 sér. t. iii. pp. 601–608; 2 figs. in text.

The following horizons occur in this mountain-district:—L. Carboniferous shales (probable); Coal Measures; Trias; Infra Lias; L. and M. Lias (probable); U. Lias; Entrochal Limestone; "Ciret;" Bajocian Iron-ore (nearly certain); G. Oolite; Callovian, Oxfordian, and Coral-

lian (probable); Kimmeridgian and Portlandian. The faults are described. G. A. L.

Ébray, Th. Sur un nouveau gisement de *Cancellophycus scoparius* dans la Haute-Savoie. [New Locality for *C. scoparius* in U. Savoy.] *Bull. Soc. Géol. France*, 3 sér. t. iii. pp. 774–776.

The fucoid occurs in black clayey limestones, like those of Crussol, &c., at the Col between the Dranse and the Risse.

Egozcue, J., and L. Mallada. Memoria geológico-minera de la Provincia de Cáreeres. [Geological and Mining Memoir on the Province of Carceres. Memoirs of the Geological Survey of Spain.] Pp. 368. 5 plates (maps & sections). 8vo. *Madrid.*

Part ii. is geological, and describes the granites and other crystalline rocks, and the Cambrian, Silurian, Devonian, and Quaternary beds. Part iii., the longest, deals with the deposits of phosphate of lime and other minerals of economic value. A catalogue of the rocks and minerals of the province is added. F. W. R.

Elberling, C. Om en kalktufdannelse ved Veistrup Aa paa Fyen. [Deposit of calc-tuff at Veistrup Aa in Fyen, Denmark.] *Vid. Medd. Nat. Foren. Kjöbenhavn*, 1875, pp. 421–424.

30 species of shells were found.

Erdmann, E. Profil genom en rullstensås. [Section across an "ås."] *Geol. Fören. Stockholm Förh.* Bd. iii. pp. 141–144, pl. vi.

Gives a sketch of the composition and stratification of an "ås" (pebble-ridge) at Pålsboda railroad-station, in Central Sweden. The lower part consists of stratified sand, the upper of rounded stones and blocks. Its height is 45, its breadth 800 to 1000 Swedish feet. E. E.

——. Några iakttagelser rörande lagerföljden i den s. k. slottskullen vid Åhus i Skåne. [Stratification of the Castle Hill at Åhus in Scania.] *Geol. Fören. Stockholm Förh.* Bd. iii. pp. 169–175, pl. vii.

Upon horizontal beds of postglacial sand are unconformable slightly inclined beds of sand, with small stones, containing fragments of burnt tiles, charcoal, vegetable ash, besides whole and broken bones of various animals, and scales of perch and bream (?). These beds, 12 to 17 feet above the sea-level and 5 to 10 feet thick, are supposed to have been accumulated, partly by the wind and partly by man's agency, about 700 years ago, when a castle stood here. E. E.

Fabre, G. Sur le terrain sidérolithique dans le département de la Lozère. [Siderolitic Deposits of Lozère.] *Bull. Soc. Géol. France*, 3 sér. t. iii. pp. 583–591.

The jurassic limestones are cut through and pierced by many veins and pipes of "eruptive" clays and granitic sands. Limonite, associated generally with oxide of manganese, occurs in these veins, the sides of which are corroded. These deposits occur also occasionally in sheets at the mouths of the veins, whence the belief that they have been

ejected. The principal direction of the veins and pipes is N.N.W. All these accumulations are referred to geyserian action towards the close of the Eocene period. G. A. L.

Falsan, —. Considérations stratigraphiques sur la présence de fossiles miocènes et pliocènes au milieu des alluvions glaciaires et du terrain erratique des environs de Lyon. [Stratigraphical Discussion of the Presence of Miocene and Pliocene Fossils among the Glacial Alluvia and Erratic Drift of the Country round Lyons.] *Bull. Soc. Géol. France*, 3 sér. t. iii. pp. 727–740, pl. xxviii.

The chief conclusions are:—1. Rise of the land and consequent retreat of the sea to the S. at the close of Miocene times; 2. There never was a Pliocene sea near Lyons; 3. All the marine fossils found in the Drift and alluvia are rolled fossils of the U. Miocene of Ponçons, near Hauterive; 4. These deposits may be called glacial, as they can be referred to the time of the formation and extension of the ancient Alpine glaciers; 5. The Erratic Drift occurs at a mean height of 300 metres. G. A. L.

——. Sur la Carte des anciens glaciers et du terrain erratique de la partie moyenne du bassin du Rhône. [On the Map of the Drift and Ancient Glaciers of the Middle Part of the Rhone Basin.] *Bull. Soc. Géol. France*, sér. 3, t. iii. pp. 740, 741.

Favre, Prof. Alphonse. Sur les anciens Glaciers du revers septentrional des Alpes Suisses. [Ancient Swiss Glaciers.] *Quart. Journ. Geol. Soc.* vol. xxxii. *Proceedings*, pp. 125, 126 (Abstract).

The areas of accession and discharge of the ancient glaciers of the Rhone and Rhine were nearly equal. The Jura glaciers served as relays to the Rhone glacier. At Calandra erratic blocks have been left at a higher level than that reached by the glacier further back. There was a continuous mass of glaciers from Central France to the Danube, resembling the Greenland or Spitzbergen ice-sheets. W. H. D.

——. Sur les terrains des environs de Genève. [Geology of Geneva.] *Bull. Soc. Géol. France*, 3 sér. t. iii. pp. 656–661.

Describes the Preglacial, Glacial, and Postglacial deposits.

——. Sur la Carte des anciens Glaciers et du terrain glaciaire de la Suisse. [On the Drift Map of Switzerland.] *Bull. Soc. Géol. France*, sér. 3, t. iii. pp. 715–719.

An account of a map showing the *névés* of the Glacial Epoch, the extent and distribution of the ancient glaciers, the Glacial deposits, including ancient moraines, accumulations of boulders, and certain isolated erratic blocks. G. A. L.

——. Réponse à M. Leymerie. [Reply to M. Leymerie.] *Bull. Soc. Géol. France*, sér. 3, t. iii. pp. 720–722, pl. xxvii. fig. 2.

Gives reasons for believing that most of the Alps were originally higher and broader than now.

Favre, Prof. Alphonse. Compte-rendu de l'excursion du 3 Septembre aux environs de Saint-Gervais, et de celle du 4 Septembre de St.-Gervais à Chamonix par le Prarion et le col de Voza. [Excursion to St. Gervais and thence to Chamounix by the Prarion and the Col de Voza.] *Bull. Soc. Géol. France*, 3 sér. t. iii. pp. 778–782, pl. xxvii.

The sections given are:—From near Bonneville to Pointe-Percée, not far from Sallanches; across the Perron and Col des Encombres; and from Mt. Blanc to the St.-Gervais Battes. G. A. L.

——. Compte-rendu de l'excursion du 5 Septembre à la Mer de Glace. [Excursion to the Mer de Glace.] *Bull. Soc. Géol. France*, 3 sér. t. iii. pp. 790–793.

——. Compte-rendu de l'excursion du 6 Septembre au Brévent. [Excursion to the Brévent.] *Bull. Soc. Géol. France*, 3 sér. t. iii. pp. 793, 794.

——. Compte-rendu de l'excursion du 7 Septembre de Chamonix à Martigny. [Excursion from Chamonix to Martigny.] *Bull. Soc. Géol. France*, 3 sér. t. iii. pp. 798-801.

——. Note sur les terrains glaciaires et post-glaciaires du revers méridional des Alpes dans le canton du Tessin et en Lombardie. [Glacial and post-glacial beds of S. flanks of the Alps in the Tessin and in Lombardy.] *Arch. Sci. Phys. Nat.* t. lv. pp. 23–34, pl.

——. Notice sur la conservation des Blocs erratiques et sur les anciens Glaciers du revers septentrional des Alpes. [The Preservation of Erratic Boulders, and the Ancient Glaciers of the N. Flank of the Alps.] 25 pp. *Geneva.*

Favre, Ernest. Note sur la structure géologique des Voirons. [Structure of the Voirons.] *Bull. Soc. Géol. France*, 3 sér. t. iii. pp. 690–694, pl. xxv. (sections).

Stratigraphy, with lists of fossils from the Chez Hominal quarry (2 horizons), of Oxfordian and Neocomian beds.

——. Note sur les terrains jurassiques supérieurs des Alpes de la Suisse occidentale. [U. Jurassic Rocks of the W. Swiss Alps.] *Bull. Soc. Géol. France*, 3 sér. t. iii. pp. 695–701.

The lower Jurassic horizon of the Voirons is between the *Ammonites transversarius* and *Amm. acanthicus* zones. The upper belongs to the latter zone. In one part of the W. Alps the deposition of the Upper Jurassic rocks continued regularly from the *Amm. transversarius* zone to the Cretaceous beds. The facies of these deposits change rapidly in a direction at right angles to the chain of the Alps, but remain the same in zones parallel to it. Lists of fossils from 3 horizons. G. A. L.

——. Revue géologique suisse pour l'année 1875. [Swiss Geological Review for 1875.] T. vi. 56 pp. *Geneva, Bâle,* and *Lyons.*

Continuation of the yearly record of geological literature relating to Switzerland and the adjoining parts of neighbouring countries. [Appeared originally in the *Arch. Sci. Phys. Nat.*] G. A. L.

Feistmantel, Karl. Zum Trilobitenfunde bei Přibram. [Discovery of a Trilobite at Přibram.] *Verh. k.-k. geol. Reichs.* pp. 162–165.

Fellenberg, E. von. Ein Abstecher in die hohe Tatra. [Excursion to High Tatra.] *Jahrb. Schweiz. Alpencl.* Jahrg. xi. pp. 320–368, coloured view and folding geological section.
Touches on the geology, pp. 363–366.

Ferrand, H. Courses dans la Savoie et le Dauphiné. [Excursions in Savoy and Dauphiné.] *Bull. Club Alp. Franç.* p. 217.
Contain geological notes.

——. Excursion à la brêche de Lauvitel. [Excursion to the Brêche de Lauvitel.] *Ann. Club Alp. Franç.* 2 ann. p. 259.
Contains geological notes.

Filhol, H. Recherches sur les Phosphorites du Quercy. *Ann. Sci. Géol.* t. vii. cah. 2, pp. 220.
Geological introduction, pp. 1–44. [Fossils, *post* under Palæontology.] The nature of the pockets in which the phosphate of lime in the Dep. Lot, Tarn, and Garonne are deposited is described, and a history of previous opinion given. They are U. Eocene, have been filled in from above, the end of the process accumulating a siderolitic deposit. Of Mollusca 29 species have been found (terrestrial). Some of the workings are 30 metres deep. E. B. T.

Flahault, Evariste. Les alluvions de la Lys, à Comines. [Alluvia of the Lys, at Comines.] *Ann. Soc. Géol. Nord*, t. iii. pp. 89–91, fig. in text.
Gives a sketch-section across the valley of the Lys, showing 7 divisions (sands, earths, peat, and clays) above the supposed Ypresian clay. The data are from two borings. G. A. L.

Fontannes, F. Sur le cailloutis de la Fuly et les sables à Buccins des environs d'Heyrien (Isère). [Pebble-bed of La Fuly and *Buccinum* sands near Heyrien, Isère.] *Bull. Soc. Géol. France*, 3 sér. t. iv. pp. 224–226.
Analysis of part of the author's memoir on "Le vallon de la Fuly, etc." See Geological Record for 1875, pp. 307, 387.

——. [On the *Ammonites tenuilobatus* zone of Crussol, near Valence.] *Mém. Ac. Lyon*, t. xxi.; abstract in *Rev. Géol.* for 1875–76; *Ann. Mines*, sér. 7, t. x. p. 559.
Is disposed to admit that the *Amm. tenuilobatus* zone, or the syn-

chronous formations of the Mediterranean characterized by *Amm. acanthicus*, represent a facies of U. Corallian or L. Kimmeridgian. E. B. T.

Fontannes, F. Sur les Sables Mio-Pliocènes du Bas-Dauphiné Septentrional. [Mio-Pliocene Sands of N. Bas-Dauphiné.] *Compt. Rend. Assoc. Franç.* 1875, pp. 679–683.

Deals chiefly with the *Nassa Michaudi* beds, intermediate between the marine sands of Tersanne and the freshwater marls of Hauterives.

Foresti, L. Cenni geologici e paleontologici sul Pliocene antico di Castrocaro. [Geological and Palæontological Notes on the Older Pliocene of Castrocaro.] Pp. 56, plate. 4to. *Bologna.* (See **Manzoni**, *post.*)

Forssman, L. A. Observationer rörande vattenböjden vid Sveriges kuster. [Variations of the Sea-level on the Swedish coasts.] *K. Svenska Vet.-Akad. Handl.* Bd. 13, No. 11, pp. 1–23, plate.

Refers to observations made, in the years 1852–1875, at 13 lighthouses around the coast of Sweden, which indicate that a rise of land has taken place in the S. as well as in the middle and N. part of Sweden. But the amount of this movement is not the same at every place of the coast, the observations showing a variation between the limits 0·45 and 3·71 Swedish feet in a century. E. E.

Fouqué, F. Rapport sur une exploration géologique de l'île de Santorin. [Geology of Santorin, &c.] *Ann. Sci. Géol.* t. vii. cah. 2, pp. 43, and 3 plates.

The first instalment of the report of an expedition, sent out by the French government in 1870, for the purpose of studying the volcano of Santorin. The changes produced in the features of the islands of the Santorin group by recent eruptions are minutely described, especial attention being devoted to the modifications of harbours and anchorage grounds. The author's study of the fumaroles, and the gases which they evolve, leads him to group them into three classes, according to their temperatures and products. Among other conclusions is the penetration of sea-water to the subterranean sources of heat, and of the reappearance of its elements in the hot springs and gaseous exhalations. J. W. J.

Fraas, Dr. O. Geologisches Profil der Schwarzwaldbahn von Zuffenhausen nach Calw. [Geological Section of the Railway from Zuffenhausen to Calw.] *Jahresh. Ver. Nat. Württ.* Jahrg. 32, pp. 101–131, pl. iii. (coloured section).

Calls attention to a glacial moraine cut through by the line between Althengestett and Calw. There are many like accumulations in the Black Forest. G. A. L.

Fuchs, Th. Ueber den sogenannten "Badner Tegel" auf Malta. [So-called Baden Clay of Malta.] *Sitz. k. Ak. Wiss. Wien, math.-nat. Cl.* Abth. i. Bd. lxxiii. Heft 1, pp. 67–84, plate.

A comparison with beds at Bologna makes it clear that the Malta

clay corresponds with certain beds there, and must be paralleled with the "Schlier" of the Vienna Basin rather than with the Baden Clay. Characteristic fossils are *Nautilus Aturi* and Sepiastaire fragments, &c. It is very rich in Foraminifera, particularly *Globigerinæ* and *Orbulinæ*; while there is a marked absence of *Miliolæ*, *Rotaliæ*, *Polystomellidæ*, *Alveolinæ*, &c., just as in the Austrian Schlier. The Malta deposits are similar to those of Radoboj, since in both cases the upper Mediterranean stage exists only in its calcareous facies (Leitha lime), the lower only in its argillaceous form (Schlier); while below is the Aquitanian stage, presenting at Radoboj its Sotzka facies, at Malta its Schio facies. The new species *Pecten Koheni* and *Scalaria melitensis* are described.
E. B. T.

Fuchs, Th. Studien über das Alter der jüngeren Tertiärablagerungen Griechenlands. [Younger Tertiaries of Greece.] *Sitz. k. Ak. Wiss. Wien, math.-nat. Cl.* Abth. i. Bd. lxxiii. Heft 1, pp. 85–88, and table.
Abstract of memoir to be printed in the *Denkschriften.*

——. Ueber die in Verbindung mit Flyschgesteinen und grünen Schiefern vorkommenden Serpentine bei Kumi auf Eubœa. [Serpentine with Flysch, &c. in Eubœa.] *Sitz. k. Ak. Wiss. Wien, math.-nat. Cl.* Abth. i. Bd. lxxiii. Heft 4, pp. 338–342, with folding section.
The serpentine is intimately connected with grey and green schists, above which come in, by gradual change and conformably, the Hippurite limestones. The serpentine is therefore comparatively modern. The schists, sandstones, shales, and breccias, inseparably intermingled with the serpentine, are much like Flysch rocks. Concludes that the "argille scagliose" of the Apennines, also ultimately connected with gabbro and serpentine rocks, as well as all similar beds, were formed by mud volcanoes, and are eruptive rather than sedimentary. E. B. T.

——. Die Solfatara und das Schwefelvorkommen von Kalamaki. [The Solfatara and Sulphur of Kalamaki.] *Verh. k.-k. geol. Reichs.* pp. 54, 55.
Corrects statements made by Prof. Ansted respecting the solfataras and sulphur produce of Kalamaki, on the Isthmus of Corinth. The solfatara does not arise from Tertiary marls, but from serpentine, upon which rest Pliocene marls and gravels. Of white Miocene limestone there is no trace visible. G. A. L.

——. Die Maklubba bei Krendi auf Malta. [Maklouba near Krendy in Malta.] *Verh. k.-k. geol. Reichs.* pp. 55, 56. Translated in *Boll. R. Com. geol. Ital.* t. vii. pp. 172, 173.
Maklouba, a deep hollow, was believed by Spratt to be due to a sinking down of the strata; is thought to be artificial.

——. Risposta alla Nota del Prof. Seguenza. [Final reply in

answer to Prof. Seguenza's notice. See GEOLOGICAL RECORD for 1875, pp. 65, 98.] *Boll. R. Com. geol. Ital.* t. vii. pp. 149–154.

Gallet, A. E. Exploration des cavernes des Alpes. Les puits aurifères de Cocrair au Mont-Clairgeon (Haute-Savoie). [Caves of the Alps. Auriferous pits of Cocrair on Mont-Clairgeon, U. Savoy.] *Bull. Club Alp. Franç.* p. 77.

Garland, Joseph. Phosphorite Mining in Nassau. *43rd Ann. Rep. R. Cornwall Pol. Soc.* pp. 96–107, 2 woodcuts; and *Rep. Miners' Assoc. Cornwall* for 1875, pp. 10–19.

The phosphorite occurs in the form of irregular beds or pockets, 6 in. to 6 ft. thick, along the irregular junction of a bed of clay with Devonian limestone. The methods of mining are described. C. L. F.

Gastaldi, Prof. B. Spaccato geologico lungo le valli superiori del Po e della Varaita. [Section along the Valleys of the Po, &c.] *Boll. R. Com. geol. Ital.* t. vii. pp. 104–111, plate.

The section first crosses the large mass of gneiss which stretches for 67 kilometres between the Dora Riparia and Varaita valleys; this oldest rock contains layers of graphite, white steatite, and crystalline limestone. It is overlain by the next great series of "*pietre-verdi*," the junction being marked by a band of limestone and calcareous schists; these green-rocks contain a great variety of serpentine and euphotide rocks, and show plainer signs of bedding than the gneissic series. They have a breadth of 22 kilometres. Above them come quartzites, forming the summit of Monte Pelvo; next calcareous schists; and then another horizon of quartzites with traces of anthracite, which the author considers may be the base of the Palæozoic zone. He has previously called the green-rocks Huronian, or Cambrian, and pre-palæozoic [see GEOLOGICAL RECORD for 1874, p. 65]. The serpentine rocks of the Apennines and other parts of the peninsula are held to be offshoots from the Alpine series, and of the same age (older than the Trias). E. B. T.

Gastaldi, Prof. B., and Prof. Baretti. Sui rilevamenti geologici in grande scale fatti nelle Alpi Piemontesi nel 1875. [Large-scale Geological Surveys in the Piedmontese Alps in 1875.] *Atti R. Ac. Linc.* ser. 2, t. iii., 7 pp., plate (sections).

Geinitz, Prof. H. B. [On *Orthis* in hornblende-schist.] *Zeitsch. deutsch. geol. Ges.* Bd. xxviii. Heft 3, pp. 643, 644.

Notices the occurrence of impressions and casts of an *Orthis*, similar to a Devonian or a Primordial one, in a green metamorphic schist, consisting of quartz hornblende and much magnetite. E. B. T.

Gesell, Sandor. Adatok a máramarosi m. k. bányaigazgatósághoz, etc. *Budapest.*

Gilliéron, —. Les anciens glaciers dans la vallée de la Wiese, dans

la Forêt-Noire. [Ancient Glaciers of the Wiese Valley, Black Forest.] *Arch. Sci. Phys. Nat.* t. lv. pp. 136–167, pl. iii.

"The glacier recognized in the main valley and in the tributary valleys of the Wiese, especially those of Präg and Muggenbrunn, stopped about Schönau."

Giorgi, Dr. Ç. De. Note geologiche sulla provincia di Lecce. [Geology of Lecce Promontory, S. Italy.] Vol. i. *Lecce.*

Describes the orography of the Taranto promontory; the coast, its movements and the action of the sea. The formations include the Hippurite Limestone (U. Cretaceous), Eocene, Pliocene, &c. Pliocene palæontology fills the latter half of the volume. Seguenza's divisions of "Zanclean" and "Astian" for the Older Pliocene are adopted, and parallels drawn with beds in other parts of Italy. (From notice in *Boll. R. Com. geol. Ital.* t. vii. pp. 249–252.) E. B. T.

——. La Terra rossa nel Leccese. [Terra rossa.] *Boll. R. Com. geol. Ital.* t. vii. pp. 294–297.

States that the "terra rossa" or "bols" of the Ostuni district, &c. is a mud rich in ferric oxide (15 to 20 p. c. sometimes) and alumina, and that it is without animal remains. It has a variable thickness of 1–10 metres, and usually covers the Cretaceous or Eocene rocks, rarely the Miocene or Pliocene. It occurs filling cracks or funnel-shaped cavities, &c., as in Dalmatia, &c. E. B. T.

Gosselet, Prof. Jules. Le Calcaire de Givet. [The Givet Limestone.] *Ann. Soc. Géol. Nord*, t. iii. pp. 36–75; 6 figs. in text.

Part 1 treats of this series as shown on the borders of Ardenne, between the Sambre and the Meuse. It is here characterized by an abundance of *Stringocephalus Burtini*, *Cyathophyllum quadrigeminum*, and *Spirifer mediotextus*. Towards the top there is a band full of *Stromatopora*, in which the foregoing fossils have not been found. At Macon and Couvin there is, below the Givet Limestone, a bed with *Orthoceras nodulosum*, which probably is near the *Calceola* schists. On the Meuse, above the Givet horizon, there are beds with *Spirifer Verneuili* and *Aviculopecten Neptuni*, which are allied to the Frasne series. A detailed critical list of the characteristic fossils follows.

Part 2 treats of the Givet series on both sides of the Silurian ridge of Condroz and of the great Fault. Concludes that:—1. Between the Sambre and the Meuse and on both sides of the Condroz ridge the Eifelian Limestone of Dumont must be divided into two, the lower division only corresponding with the Givet Limestone, the upper representing the Frasne Limestone. 2. The Givet Limestone is constant on the N. border of the Dinant basin, and thickens from E. to W.; on the S. border of the Namur basin it is also constant, but thin; on the Sambre it is wanting. 3. The Frasne Limestone is thicker and more important than the Givet Limestone, and very constant and regular. 4. Both these Limestones are similar on both sides of the Condroz ridge; the sea, therefore, probably was over that ridge, though it does not follow that it deposited any thing there. G. A. L.

Gosselet, Prof. Jules. Nouvelles observations géologiques faites dans les concessions de Crespin et de Marly. [New Geological Observations at Crespin and Marly.] *Ann. Soc. Géol. Nord*, t. iii. pp. 83, 84.

Notes local details proved by recent workings.

——. Compte-rendu de l'excursion à Artres, et aperçu général sur la géologie des environs de Valenciennes. [Excursion to Artres, and Geology of the Country round Valenciennes.] *Ann. Soc. Géol. Nord*, t. iii. pp. 131–138.

In descending order the rocks of the Valenciennes district are:—Tertiary—white sands and sandstone of the Tapage, green sands of Famars, Tuffeau, clay with flints; Secondary—chalk with flints, *Terebratula gracilis* marls, blue and green marly clays with beds full of *Inoceramus labiatus*, *Pecten asper* zone; Palæozoic—Coal Measures, Devonian. Above the Coal Measures there is occasionally present a very hard sandstone, shown by Dr. Barrois to be a kind of passage-bed (palæontologically) between the "craie glauconieuse" and the Gault.

G. A. L.

——. Compte-rendu de l'excursion du 5 Septembre, ... du 6 Septembre, ... du 7 Septembre, ... du 8 Septembre. *Bull. Soc. Géol. France*, sér. 3, t. ii. pp. 663–691.

——. Quelques réflexions sur le calcaire eifélien. [Eifelian Limestone.] *Bull. Ac. Roy. Belg.* sér. 2, t. xli. pp. 1310–1314.

Refers to Dumont's "Eifelian Limestone (E^3)." The calcareous zone running along the N. side of the Silurian ridge of Condroz is shown to belong almost entirely to the Frasne Limestone, the *Stringocephalus* Limestone being only known near Namur, and only a few metres thick. The same results hold good for the calcareous band on the S. flank of the Condroz ridge.

G. A. L.

Gourdon, M. La vallée d'Aran. [The Aran Valley.] *Bull. Club Alp. Franç.* p. 304.

Contains geological notes.

Grad, Ch. Études sur les Vosges: Orographie de la chaîne des Basses-Vosges. [Orography of the Lower Vosges.] *Ann. Club Alp. Franç.* 2 ann. p. 641.

Describes the physical and geological features of the district.

Greppin, Dr. Oolithe Inférieure à l'Amone. Val de Ferret (Valais). [Inferior Oolite at l'Amone.] *Emul. Jur.* 1 ann. pp. 368, 369.

During a survey of the iron-mines of l'Amone the author collected a number of fossils from the clayey limestones there developed, the exact position of which among the Jurassic rocks had not been fixed. The species indicate that the beds are Bajocian or Inferior Oolite.

H. B. W.

Groddeck, A. von. Ueber die Lagerungsverhältnisse des Oberharzer Diabaszuges, und das Auftreten von Posidonomyenschiefern des Culm südöstlich von demselben. [On Diabase-band and Culm-slates of Upper Hartz.] *Zeitsch. deutsch. geol. Ges.* Bd. xxviii. Heft 2, pp. 361–368; 2 woodcuts.

Notes discovery of *Posidonomya Becheri* in the Widerwag valley on the S.E. of the band of Diabase and associated beds which belong to the Devonian; as the Culm also occurs on the N.W., a series of folds is assumed and expressed in the sections given. The Culm and Devonian are perfectly conformable. E. B. T.

Gröger, Fr. Zum Vorkommen des Quecksilbererzes. [The Occurrence of Quicksilver-ore.] *Verh. k.-k. geol. Reichs.* pp. 66–70.

A general sketch of the mode of occurrence of Quicksilver in the different localities where it has been worked in Europe, America, and the Malay Archipelago. The geology of Idria and other Krain localities is compared with that of Almaden and New Almaden. G. A. L.

Grotowsky, L. Der derzeitige Stand des Paraffin- und Mineralöl-Gewinnung in der Provinz Sachsen. [Condition of the Paraffin and Mineral Oil Industry in Prussian Saxony.] *Zeitsch. Berg-, Hütt. Salinenw.* Bd. xxiv. pp. 351–401, pls. vi.–viii.

The mode of occurrence, distribution, and chemical composition of the raw material used in the manufacture of paraffin by dry distillation, namely the so-called Pyropissite or Schweelkohl, an earthy lignite, are described in pp. 355–358. The rest has reference to the technical details of manufacture. H. B.

Gruner, L. Observations sur la note de **M. Mallard.** [Remarks on **M. Mallard's** note (see **Mallard,** p. 92).] *Bull. Soc. Géol. France,* 3 sér. t. iv. pp. 73–82.

Disagrees with M. Mallard's conclusions, and bases his opinions on observed facts, among others on comparative tables of temperature and rainfall in the Alps, prepared by Prof. Plantamour. G. A. L.

Gümbel, Dr. C. W. Geognostiche Mittheilungen aus den Alpen: III. aus der Umgegend von Trient. [Alpine Geology: iii. The Trient district.] 5 pp. *Münich.* Noticed in *Boll. R. Com. geol. Ital.* t. vii. pp. 439, 440.

Holds that the isolated Dolomite masses are not separate coral-reefs in place, but denuded parts of a continuous sheet; also that the Belerophon-limestone is not Permian, but a repetition of a Pre-triassic fauna in Triassic beds, &c. E. B. T.

Guillemin, P. Ascension du Chaberton. [Ascent of the Chaberton.] *Ann. Club Alp. Franç.* 2 ann. p. 173.

Refers to geological points.

Gumælius, O. Några iakttagelser rörande Sveriges glaciala Vild-

ningar. Från åren 1874 och 1875. [Observations on Swedish Glacial Deposits during 1874 and 1875.] *Geol. Fören. Stockholm Förh.* Bd. iii. pp. 8–20, plate.

Figures and a short description of some cuttings through deposits of gravel, sand, and till (moraines) at places in Central Sweden. Some notes are given of the glacial phenomena observed on the iron-ore mountains, Gellivare, Kürunavaara, Luossavaara, and Haukivaara, in the northernmost part of Sweden, as well as on the high mountain Sulitelma. Polished and striated rock-surfaces have been observed 3500 Swedish feet above the sea-level. E. E.

Gumælius, O. Om mellersta Sveriges glaciala Vildningar. 2. Om rullstensgrus. [Glacial Deposits of Central Sweden: 2. On gravel (åsar).] *Supplem. to K. Svenska Vet.-Akad. Handl.* Bd. 4, No. 3, pp. 1–74, map.

Gives an account of the work of previous observers, and describes the Swedish åsar, their size, distribution, and internal structure, the derivation of their materials, their relation to the contour of the country, and their direction compared with that of striæ. Notices the different theories of the origin of the åsar, and sketches out a new theory, according to which the main mass of the åsar would be derived from so-called "inner moraines" in the lower parts of inland ice and glaciers. E. E.

Habenicht, H. Die Verbreitung der sedimentären Formationen in Europa. [Distribution of Sedimentary Formations in Europe.] *Geogr. Anst. Mitth.* Bd. xxii. plate 5, explanatory note pp. 81–84.

A geological map of Europe, based on Dumont's, but including newer materials. Scale 1 : 15,000,000. The divisions shown are:—Pliocene, Miocene, Eocene, Cretaceous, Oolite (Oberer Jura), Lias (Unterer Jura), Trias, Permian (Dyas), U. and L. Carboniferous, U., M., and L. Devonian, Silurian, and Cambrian, metamorphic, and igneous rocks. G. A. L.

Halfar, A. Notiz über ein neues Vorkommen jüngerer Devonpetrefacten in anscheinend zweifellosem Spiriferen-Sandstein am oberen Grumbacher Teiche nördlich von Zellerwald im hannoverschen Oberharze. [U. Devonian of the W. Harz.] *Zeitsch. deutsch. geol. Ges.* Bd. xxviii. Heft 3, pp. 448–456, sketch map.

Note on discovery in the W. Hartz at the Grumbach reservoir of U. Devonian fossils, *Tentaculites*, *Goniatites*, *Phacops latifrons*, &c., in close proximity to the Spirifer-sandstones (L. Devonian). At the Auerhahn reservoir Calceola-beds are seen between; hence the U. Devonian fossils belong probably to the base of the Goslar beds. E. B. T.

Harpe, Dr. Ph. de la. Sur un gisement de Tourbe glaciaire trouvé à Lausanne. [Glacial Peat at Lausanne.] *Bull. Soc. Vaud. Sci. Nat.* ser. 2, vol. xiv. pp. 456–458.

Lying on lacustrine marl with recent shells was peat a yard thick,

containing remains of wood and bark, reeds, &c.; above was a bed with glacial pebbles. The peat is therefore probably of the glacial age, seeing that it is not covered by the thicker glacial deposits of the district. E. B. T.

Hauer, Ritter von. Jahresbericht des Directors, etc. . . . . [Annual Report of the Director of the Imperial Geological Institute.] *Verh. k.-k. geol. Reichs.* pp. 1–27.

Gives a summary of the work of each member of the Austro-Hungarian Geological Survey in 1875, with an account of the publications issued or in progress. G. A. L.

Hébert, Prof. E. Ondulations de la Craie dans le bassin de Paris. Troisième Partie. [Undulations of the Chalk in the Paris Basin. Part 3.] *Bull. Soc. Géol. France*, 3 sér. t. iii. pp. 512–546, plate xvi.

This part is divided under the following heads:—1. The folds indicated by the section from the Perche District to Artois; 2. The folds shown in cliff-sections of the Channel—A. from Hâvre to Fécamp, B. from Fécamp to Dieppe, C. from Dieppe to Criel, D. Synclinal of the Criel valley, E. Anticlinal of the Bresle valley, F. Synclinal of the Somme valley, G. Anticlinal of the Boulonnais; 3. Comparison of the undulations determined by both sections. The anticlinal axes recognized are the Perche axis, and those of the Seine, of Bray, of the Bresle, and of Artois. The depressions between these convex folds are those of the Eure (between the Perche and the Seine), of the Vexin (between the Seine and Bray), of the Yères and Thérain (between Bray and the Bresle), and of the Somme and the Avre (between the Bresle and Artois). G. A. L.

——. Classification du terrain crétacé supérieur. [Classification of U. Cretaceous Beds.] *Bull. Soc. Geol. France*, 3 sér. t. iii. pp. 595–599, folding table.

Tabulates these rocks under 6 French and 2 European columns. 19 divisions are given.

——. Remarques à l'occasion des sondages exécutés par la Commission française dans le Pas-de-Calais. [Remarks on the Borings of the French Commission in the Straits of Dover.] *Bull. Soc. Géol. France*, 3 sér. t. iv. pp. 58–61.

Believes, from the data procured, that the *Inoceramus labiatus* chalk is more in the line of the proposed tunnel than the Rouen Chalk. Denies that he ever suggested a curvilinear tunnel. G. A. L.

——. Sur la position exacte de la zone à *Heterodiadema libycum*. [Exact position of the *H. libycum* zone.] *Bull. Soc. Géol. France*, 3 sér. t. iv. pp. 319, 320.

Gives detailed measurements of the Gueule d'Enfer sections, showing

the exact position of the zone in question, about 13 metres below the Turonian beds with *Radiolites cornupastoris*. G. A. L.

Hébert, Prof. E. Ondulations de la Craie dans le Nord de la France. [Undulations of the Chalk in N. France.] *Ann. Sci. Géol.* vii. cah. i. 48 pp.; 2 plates (map and section), 3 woodcuts. Noticed in *Geol. Mag.* dec. ii. vol. iv. pp. 75–77.

In relation to the two systems of folds enumerated here and in "Undulations of the Chalk in the Paris Basin" (see p. 72), lays down the age of some of the movements of N. France in Secondary times. The 1st predicated is the depression of the Weald, direction S.W.–N.E.; the 2nd that of the R. Somme, S.E.–N.W., between the Weald and Neocomian; the 3rd the commencement of the Weald and Boulonnais anticlinal, S.E.–N.W., between the Gault and glauconitic chalk; the 4th separates the Cenomanian from the Turonian, it is the S.W.–N.E. anticlinal from Ferté-Bernard to Brunelles; the 5th is the triple fold of the Perche, S.E.–N.W., of Turonian date; the 6th set are those of the Seine, Bray, Bresle, and Artois, S.E.–N.W., dating after the *M. coranguinum* Chalk, and before the *Belemnitella* beds; the 7th, S.W.–N.E., Breteuil to Pressagny, is also before the last-mentioned beds. These are irrespective of others whose age cannot be given; the S.E.–N.W. system has had most influence on the relief of the ground. E. B. T.

——. Undulations of the Chalk in the North of France, and their probable existence under the Straits of Dover. *Rep. Brit. Assoc.* for 1875, *Sections*, pp. 67–69.

The author, having shown that the Cretaceous beds in the N. of France are folded so as to form 5 anticlinal axes having a S.E. and N.W. direction, now shows that there are folds transverse to this, or from S.W. to N.E. This is proved by observing the heights attained by the Chloritic Marl. The author infers that a transverse anticlinal lies under the Straits of Dover, which will bring the U. Greensand within the line of the proposed tunnel. W. T.

——. Plissements de la Craie dans le Nord de la France. [Folds of the Chalk in N. France.] *Compt. Rend.* t. lxxxii. pp. 101, 236, 919.

On the same subject as the foregoing abstracts.

——. Notes sur le Terrain Crétacé du Département de l'Yonne. [Cretaceous Beds of the Yonne.] *Bull. Soc. Sci. Yonne*, sér. 2, t. ix. pp. 15–46.

Details of sections in the N.E. corner of the department. The Cenomanian (*Ammonites varians*) is subdivided into chalky marls (*Ostrea vesiculosa*) and *Holaster nodulosus* Chalk. The latter is followed by the Turonian (*Inoceramus labiatus* Chalk below, *Holaster planus* Chalk above), and that by the Senonian (*Micraster cor-testudinarium*) Chalk. W. H. D.

Heer, Prof. Oswald. The Primæval World of Switzerland. Trans-

lation, by **W. S. Dallas**, of "Urwelt der Schweiz," 1865. Edited by **J. Heywood**. 2 vols. Pp. xvi, 393, and viii, 324; 20 pls. 8vo. *London.*

Describes the geographical conditions, fauna, and flora of each period represented in Switzerland from the Carboniferous epoch.

Helmersen, Gen. G. von. Ueber die Nothwendigkeit des Waldschutzes für die schiffbaren Ströme Russlands und über neue montanische Untersuchungen und Massnahmen in Russland. [New Mining Investigations in Russia, &c. . . . .] 17 pp. 12mo. *St. Petersburg.*

Contains notes of geological interest.

Héna, J.-T. Les schistes carburés des Côtes-du-Nord. [Carbonaceous schists of the Côtes-du-Nord.] *Compt. Rend.* t. lxxxiii. p. 631.

Herbich, Fr., and Dr. M. Neumayr. Beiträge zur Kenntniss fossiler Binnenfaunen. 7. Die Süsswasserablagerungen im südöstlichen Siebenbürgen. [Freshwater Fossils, &c.] *Jahrb. k.-k. geol. Reichs.* Bd. xxv. Heft 4, pp. 401–431, tab. 16, 17, and 3 woodcuts.

Describes the Neogene freshwater beds of Vaspatak, &c. in S.E. Transylvania. The lower beds are clays with valuable lignite and iron-ore; these belong probably to the base of the Congeria-beds. Above are sands, &c. with abundant *Congeriæ*, followed by conglomerates, which, perhaps, may not belong to the Pliocene series. [For Palæontological part see *post*, under **Neumayr**.] E. B. T.

Heusler, C. Ueber das Vorkommen von Nickel- und Cobalterzen mit gediegenem Wismuth an der Crête d'Omberenza im Kanton Wallis. [Nickel Ores, &c. in the Valais.] *Zeitsch. deutsch. geol. Ges.* Bd. xxviii. Heft 2, pp. 238–247, tab. 6 (map).

Nickel and cobalt occur on the Crête d'Omberenza, between Turtmann and Anniviers valleys, at a height of 2990 metres at the Turtman Glacier, in the green metamorphic slates. In the former valley the cobalt and nickel ores occur in veins, in the latter in layer-like deposits; and in those at Kaltberg bismuth occurs. The depth reached is only 18 metres; but the ore-bearing localities are so far separate in horizontal distance and in level that the deposit will probably prove to be of great depth. Analyses of ores are given. E. B. T.

Heywood, James. On the Geology of Switzerland. Part ii. *Proc. W. Lond. Sci. Assoc.* vol. i. pp. 45, 46 (Abstract).

The range and characters of the Carboniferous, Permian, Triassic, Liassic, Jurassic, Neocomian, Eocene, and Miocene beds are given. W. H. D.

Hicks, H. Some considerations on the probable conditions under which the Palæozoic rocks were deposited over the Northern

Hemisphere. *Geol. Mag.* dec. ii. vol. iii. pp. 156–160, 215–218, and 249–253.

Before the Huronian rocks were deposited large continents existed in America and W. Europe. The Atlantic coasts of these sank first, in Europe to 30,000, in America to over 18,000 feet, leaving mountains as islands. Deposition was assisted by animal life and by volcanic eruptions, submarine at first, latterly subaërial (Wales and Cumberland). Local elevations at the close of the Bala period were followed by gradual subsidence throughout the U. Silurian epoch. In the latter half of the Devonian period volcanic action and oscillations of level produced in E. America and W. Europe continents with lakes and inland seas. The Carboniferous period also began with depression, volcanic action and elevation occurring later. The volcanic rocks of each age occur in the areas of greatest depression. Some beds buried 50,000 feet are unaltered except where interscected by trap-dykes. As to climate, the Laurentian limestone and graphite point to abundant animal and (probably terrestrial) vegetable life. From geographical considerations the climate must have varied from cold to mild, the more equatorial fauna migrating northward when the conditions favoured them. Development progressed most in the warmer latitudes. Lines of migration coincide with those of greatest depression.

W. H. D.

Hicks, H. The Oldest Fossiliferous Rocks of Northern Europe. *Geol. Mag.* dec. ii. vol. iii. p. 240.

Reply to Prof. Linnarsson, whose evidence is claimed for instead of against the author's views. Insists on the distinctness of the Harlech and Menevian faunas. W. H. D.

Hoernes, Dr. Rud. Ein Beitrag zur Kenntniss fossiler Binnenfaunen. [Freshwater (Tertiary) Fossils, &c.] *Sitz. k. Ak. Wiss. Wien, math.-nat. Cl.* Abth. i. Bd. lxxiv. Heft 1, pp. 7–34, plate.

From freshwater beds near Renkiöi, Turkey, below the Sarmatian beds, the following new forms were obtained and are described :—*Melanopsis acanthicoides*, *M. trojana*, *Paludina Hectoris*. The freshwater beds below the Sarmatian Mactra-limestone are distinguished as the "pontic" stage, and those above as the "levantine" stage; these occur near Constantinople. E. B. T.

——. Das Erzvorkommen am Mte. Avanza bei Forni Avoltri.—Bemerkungen über die paläozoischen Gesteine des Pusterthales. [Ore Deposits of Monte Avanza near Forni Avoltri.—Palæozoic Rocks of the Pusterthal.] *Verh. k.-k. geol. Reichs.* pp. 60–66, 2 figs. in text; Italian translation in *Boll. R. Com. geol. Ital.* t. vii. pp. 139–146.

Monte Avanza is formed of Mountain Limestone, whilst the ore-bearing beds cropping out on its flank are Coal Measure shales: the Casanna beds. The latter are faulted against Verrucano (Per-

mian). The succession of beds is well shown in an E. and W. section across the Kreuzberg, where the following divisions occur in undisturbed order:—*Trias.* Dachstein limestone, Raibl beds, St. Cassian and Wengen beds, Buchenstein limestone, Muschelkalk, Werfen beds. *Permian.* Bellerophon limestone, "Rauchwacke" and gypsum, Grödner sandstone, Verrucano (with porphyry). *Carboniferous.* Coal Measures (Casanna beds), Carboniferous Limestone. G. A. L.

Hoernes, Dr. Rud. Vorlage der im Sommer 1875 aufgenommenen Karten. [Report on the Maps surveyed in the Summer of 1875.] *Verh. k.-k. geol. Reichs.* pp. 80–84.

Summary of work done by the Austro-Hungarian Geological Survey.

——. Neocomfundorte in der Gegend von Ampezzo und Enneberg in Südtirol. [Neocomian localities in the neighbourhood of Ampezzo and Enneberg, in S. Tyrol.] *Verh. k.-k. geol. Reichs.* pp. 140, 141.

The localities enumerated (with short lists of fossils) are seven in number:—1. Zwischenkofelalp; 2. Gran Camploratsch; 3. Klein-Fanis; 4. Antruilles; 5. La Stuva; 6. La Rosa; 7. Fossealp. G. A. L.

——. Versteinerungen aus dem Dachsteinkalk des Marmarole, und des Antelao vom Val di Riu bei Anzonzo und Val Oten bei Pieve di Cadore. [Dachstein of Marmarole, Antelao, &c.] *Verh. k.-k. geol. Reichs.* pp. 183–187. Translated in *Boll. R. Com. geol. Ital.* t. vii. pp. 232–256.

——. Beiträge zur Kenntniss der Neogen-Ablagerungen im Banat. i. Bohrloch von Körpa. ii. (see INVERTEBRATE PALÆONTOLOGY, *post*). iii. Tunnel bei Domašnia. iv. Bohrloch von Karansebes im Temesthal. [Contributions towards a Knowledge of the Neogene Deposits of Banat. i. Körpa borehole. iii. Tunnel at Domašnia. iv. Karansebe borehole.] *Verh. k.-k. geol. Reichs.* pp. 198–205.

i. Detailed section of boring at Körpa, with lists of fossils, especially Foraminifera, determined by **Felix Karrer**. The Mediterranean beds are reached; but no brown-coal worth working has been met with. iii. Notes on fossiliferous Sarmatian beds disclosed by the tunnel. iv. Concludes that the brown-coal of this region belongs in part to the Sarmatian and in part to the Mediterranean stage. G. A. L.

——. Aufnahmen in der Umgebung von Belluno. [Surveys round Belluno.] *Verh. k.-k. geol. Reichs.* pp. 241–243. Translated in *Boll. R. Com. geol. Ital.* t. vii. pp. 495–503.

Brief report of geological work done.

——. Aufnahmen in der Umgebung von Agordo, Feltre und Longarone. [Surveys in the Neighbourhood of Agordo, Feltre, and Longarone.] *Verh. k.-k. geol. Reichs.* pp. 341–342.

Hollande, D. Sur les gîtes métallifères de la Corse. [Metalliferous Deposits of Corsica.] *Bull. Soc. Géol. France*, 3 sér. t. iv. pp. 30–34.

These are:—1. Antimonite, in serpentine, serpentinous limestone, glossy schists, and pegmatite, at Luri, Meria, and Ersa, Cape Corse. The antimonite is found associated with cinnabar. 2. Phillipsite and galena, in granite, at Argentella. The galena is poor in silver. 3. Copper-ores at Castifao, Moltifao, Canavaggia, Lento, &c. in the glossy schists abutting against serpentine. 4. Native copper, in serpentine, at Linguizetta. 5. Galena, in granite and in the serpentinous glossy schists at Calenzana, &c. 6. Hæmatite in large masses in the granite of Otta, Vero, &c. in the Tenda range. Iron-pyrites very common. 7. Manganese ores in the Tenda hills. The copper-ores are found in a band running S.E. and N.W. G. A. L.

——. Note sur les terrains tertiaires de la Corse. [Tertiary Rocks of Corsica.] *Bull. Soc. Géol. France*, 3 sér. t. iv. pp. 34–43.

No deposits were formed in Corsica between Infra-Liassic and the Eocene times when the Nummulitic beds were accumulated. These are largely denuded. The Miocene beds occur in 3 isolated patches—on the E. shore of the St. Florent Gulf, at Bonifacio and in Santa-Manza Gulf, and at Aleria. These deposits are alike lithologically and to a great extent also palæontologically; they have, however, been unequally disturbed. Short lists of fossils are given. G. A. L.

——. Le littoral de la Corse s'élève depuis l'époque quaternaire. [The Corsican Coast rising since Quaternary Times.] *Bull. Soc. Géol. France*, 3 sér. t. iv. pp. 86–91.

Gives a *résumé* of the Quaternary deposits of the Island. Shows that many deposits (raised beaches, drift, alluvia, &c.), quite different from the present coast-accumulations, are found at between 15 and 20 metres above the sea-level. G. A. L.

——. Terrains sédimentaires de la Corse. [Sedimentary Deposits of Corsica.] *Bull. Soc. Géol. France*, 3 sér. t. iv. pp. 431–433.

Gives a summary of the formations present, which are:—Metamorphic rocks (pre-Carboniferous), Carboniferous, Trias?, Rhætic and Lias, Eocene, Miocene, Pliocene, Quaternary. [The Table of formations (p. 433) is in No. 7 of the Bulletin, published in 1877.] G. A. L.

Holst, N. O. Om de glaciala rullstensåsarne. [On Åsar.] *Geol. Fören. Stockholm Förh.* Bd. iii. pp. 97–112.

Gives a short review of the theories which have been advanced to explain the mode of origin of the åsar. Thinks none of them satisfactory. Considers the åsar as the remains of the sand, gravel, and waterworn stones accumulated at the bottom of channels grooved out by the melting water and ice of the great ice-sheet. Refers chiefly to Scandinavian facts. E. E.

Houzeau de Lehaie, A. Note sur les Alluvions de La Trouille dans les environs de Mons. [Alluvia of La Trouille near Mons.] *Ann. Soc. Mal. Belg.* t. x. pp. 33–35.

Gives a measured section, showing a bed of peat resting on pebbly sand and overlain by loam, together with a list of 38 land and fresh-water shells found in the sand and loam. G. A. L.

Inchbald, Peter. Fossil remains of *Lagomys corsicanus*. *Land and Water*, June 24.

Records the finding of the remains of this rodent in osseous breccia in caves and fissures near Bastia. The breccia in which it occurs consists of the fragments of various bones, cemented together by calcareous or other matters. G. H. K.

Issel, A. Osservazioni geologiche sul Monte Negro (territorio di Porto Maurizio). [Geological Observations on Monte Negro.] *Boll. R. Com. geol. Ital.* vii. pp. 485–490.

Mentions that Eocene limestones are traversed by many quartz veins, the means of silicifying and altering the beds; also that one vein bears argentiferous lead-ore, which was once worked. E. B. T.

Jaccard, Prof. Sur la présence d'un dépôt glaciaire avec blocs alpins sur le versant septentrional de Pouillerel. [Glacial Deposit on N. Slope of Pouillerel (French Jura).] *Bull. Soc. Sci. Nat. Neuchâtel*, t. x. cah. 3, pp. 264–267.

Jaubert, —. Étude géologique sur les grottes préhistoriques de Gréoulx, dans leurs rapports avec les eaux thermales. [Geology of the Prehistoric Caves of Gréoulx in connexion with Thermal Waters.] *Compt. Rend.* t. lxxxiii. p. 698.

Jentzsch, Alfred. [Geology of E. Prussia.] *N. Jahrb.* Heft vii. pp. 738–740.

Announces the discovery of *Leda*-clay near Schippenbeil. Recognizes 2 or 3 distinct diluvial faunas in the district, indicating gradual change from deep-sea to shore-conditions. A deep boring in Samland has entered a glauconitic chalk-marl with fragments of *Belemnites*, probably *B. mucronatus*. F. W. R.

Jernström, A. M. Om Finlands postglaciala skalgrusbäddar. [On the Postglacial shellbeds of Finland.] *Geol. Fören. Stockholm Förh.* Bd. iii. pp. 133–140.

Refers to the discoveries of subfossil marine and freshwater shells during the last century, in places 30 to 60 feet above the sea-level.

——. Om quartärbildningarne längs Åbo-Tammerfors-Tavastehus jernvägslinie. [Quaternary Deposits along the Åbo-Tammerfors-Tavastehus Railway.] *Bidrag till kännedom af Finlands natur och folk*, Häft 20, *Helsingfors*, pp. 1–75; 9 plates.

Gives, after a short account of the solid rocks, a minute descrip-

tion of the Quaternary deposits, especially the till and the åsar. Two plates contain sections to a scale of 1 : 400,000, and the others many detailed sections showing the order of superposition and the character of the beds in several åsar, &c. E. E.

Jernström, A. M. Strödda geognostiska anteckningar. [Geological Notes.] *Bidrag till kännedom af Finlands natur och folk*, Häft 20, *Helsingfors*, pp. 79–115, plate.

An account of a number of observations, made, in 1865 and 1866, during the geological survey of Lojo "socken" in Nyland "län," Finland:—I. Giant's kettles; rock-striations; erratic blocks; lake iron-ore; springs. II. Contains a detailed description of an ås (the Lojo-ås) which stretches in direction N.E. to S.W., through the Lojo socken. The plate contains a map of the ås and its surroundings, on the scale of 1 : 80,000, and a number of cross sections of the ås. Stratified and unstratified clay, as well as peat, are explained. E. E.

Johnstrup, F. Om Grönsandet i Sjælland. [Greensand of Sjælland, Denmark.] *Vid. Medd. Nat. Foren. Kjöbenhavn.* 32 pp., plate.

Notices the distribution, the order of superposition, and the water-bearing property of the Greensand. Compares its age with that of the greensand of Bornholm. The following tabular view shows the arrangement of the Cretaceous beds in Denmark:—

Younger Chalk (Danian), (*Belemnitella mucronata* not occurring).	Greensand.	Locality.
	Saltholm-calc.	Lellinge.
	Limestone.	
	Faxoe-calc and limestone.	
	The Faxoe-bed.	
	Fish-clay.	Stevns and Faxoe.
Younger Senonian (with *Belemnitella mucronata*).	White chalk.	
Older Senonian (containing *Belemnites Westfalicus*).	Arnager-calc.	Bornholm.
	Greensand stone.	

On the plate are several sections, the results of a number of borings through the Boulder Clay, the Greensand, the Saltholm-calc, and limestone. A list of the Chalk-fossils of Bornholm and of those of the Greensand-beds of Lellinge by **O. Mörch** is given. E. E.

——. De geognostiske Forhold i Jylland. [Geology of Jylland.] *Tidskrift for Landökonomi. Kjöbenhavn.*

Judd, J. W. On the Ancient Volcano of Schemnitz, Hungary. *Quart. Journ. Geol. Soc.* vol. xxxii. pp. 292–324, pl. xx. (folding map).

The outer ring of volcanic rocks resting on Secondary and Tertiary beds consists chiefly of andesite-lavas with tuffs containing remains of land animals and plants, with, in places on the outer edge, brackish-water shells. These fix the date of eruption as U. Miocene. The interior consists of highly metamorphosed Triassic rocks with masses of rhyolite, &c., slightly newer than the andesitic lavas, and "puys"

of basalt posterior again to the rhyolites. The series overlap one another, having no great difference of age. Volcanic action commenced in the Oligocene and reached its height in the U. Miocene period, the district resembling the Grecian Archipelago. Hot springs still exist, and earthquakes are not uncommon. Some of the puy-cones are visible. The granitic rocks are unerupted andesite lavas, not Triassic rocks metamorphosed in place, which are represented by aplite, having been completely fused. Many analyses of igneous rocks are given. The metalliferous lodes (N.N.E.–S.S.W.) are partly Post-pliocene.

W. H. D.

Judd, J. W. Contributions to the Study of Volcanos. 2nd Series. The Ancient Volcanos of Europe. *Geol. Mag.* dec. ii. vol. iii. pp. 53–63.

Describes the Kammerbuhl, Bohemia, a volcanic cone.

——. Contributions to the Study of Volcanos. 2nd Series. On the Interval which separated the two great Periods of Volcanic Activity in Connexion with the Formation of the Alpine System. *Geol. Mag.* dec. ii. vol. iii. pp. 337–345.

All the Mesozoic and L. Eocene formations attain enormous thickness in the Alps, without a break. The deep-sea band separated northern and southern life-provinces, and contained vast coral-reefs. As with modern areas of depression, no volcanic action occurred in the Mesozoic period in Central Europe. The Cambro-Carboniferous geosynclinal of N. America is analogous to the Trias-Eocene geosynclinal of the Alps. As subsidence ceased, volcanic action commenced on the outskirts of the mass of sediments, eventually raising it above the snow-level, so as to produce glaciers in a subtropical climate, as in the British Oolites and modern Antarctic regions. W. H. D.

——. On the Volcanic Outbursts which preceded the Formation of the Alpine System. *Geol. Mag.* dec. ii. vol. iii. pp. 200–215, woodcut.

Describes the quartz-porphyry of Botzen (Permian) and the igneous rocks (Triassic) of Predazzo and Monzoni (monzonite, tourmaline-granite, melaphyre, augite-, uralite-, and orthoclase-porphyry). A list of minerals and many analyses given; the subsidence following eruption noted; and the extent of the volcanic rocks shown. W. H. D.

Jullien, —. Sur les gisements de silex et les tombeaux mégalithiques de Khenchela. [The Flint Deposits and Megalithic Tombs of Khenchela.] *Bull. Soc. Anthrop. Paris*, sér. 2, t. xi. p. 161.

Kalkowsky, Ernst. Das Glimmerschiefergebiet von Zschopau im sächsischen Erzgebirge. [Mica-schist of Zschopau.] *Zeitsch. deutsch. geol. Ges.* Bd. xxviii. Heft 4, pp. 682–749, tab. x. (sections).

The chief divisions of the Archaic formation noticed are in natural

succession—dark mica schist, gneissic mica schist, pale mica schist with potash-mica, red gneiss; the last appears as alternating bands, and is certainly not eruptive. The microscopic character of each is described, and analyses given. The movements of the beds, anticlinals, faults, &c. are noticed, and the metallic veins, while the eruptive rocks are described elsewhere. E. B. T.

Karpinski, A. [Geological Researches: On Salt in the Devonian, in the Government of Tskovsk.] *Gornoi Journ.* vol. i. pp. 179–191.

Kaufmann, Prof. F. J. Zur Geologie des Clubgebietes. [Geology of the Club-district.] *Jahrb. Schweiz. Alpencl.* Jahrg. xi. pp. 45.
Describes 5 new Jurassic localities, giving list of fossils.

Kindak, —. [Quartzose Rocks and Mines in the Government of Kiela, Poland.] *Gornoi Journ.* vol. ii. pp. 105–111, pl. (Palæozoic fossils).
Orthisina Russelli and *Strophomena Klonovi* are figured.

Kjerulf, Prof. Th. Istiden. [The Glacial Period.] *Fra Vidensk. Verd. Kjöbenh.* Bd. iii. no. 17, pp. 203–274; 4 figs. and 2 maps in text.
Gives an historical sketch of the Glacial Period and of the different theories proposed to account for its phenomena. Notices the remains of former glaciation in the Pyrenees, the Vosges, Switzerland, Italy, S. Tyrol, S. Bavaria, England, Scotland, N. Germany, Russia, Sweden, Norway, &c. A map shows the distribution of erratic blocks and moraines in Europe. E. E.

——. Et Stycke Geografi i Norge. [A Bit of Geography in Norway.] *Forh. Vid.-Selsk. Christiania*, No. 3, 18 pp., map.
The author thinks that the direction and position of the valleys, fjords, lakes, &c., as well as the boundaries of the high plateaux, owe their origin to certain *series* of parallel fissures, which cross the whole country in certain directions (N.E.–S.W., N.W.–S.E., E.–W., and N.–S.), and divide it into separate parts, some of which are lifted up higher than others. The map shows the occurrence of such fissure-lines, and their relation to the present geographical aspect of the country. E. E.

——. Island's Vulcanlinien. [Lines of Vulcanicity in Iceland.] *Zeitsch. deutsch. geol. Ges.* Bd. xxviii. Heft 2, pp. 203–216, pl.
A German version of the paper noticed in the Geological Record for 1875, p. 75.

Klipstein, Dr. v. Vorläufige Notiz über ein bemerkenswerthes neues Vorkommen von Juraversteinerungen im Gebirge zwischen dem Gader- und Ampezzaner Thale. [New Occurrence of Jurassic 1876.

Fossils in the Mountains between the Gader and Ampezzo Valleys.] *Verh. k.-k. geol. Reichs.* pp. 137–140.

The fauna announced as having been found near Lavarella is chiefly that of the Coral Rag, but with an admixture of Brown Jura (Inf. Oolite, &c.) forms. G. A. L.

Klunge, A., and M. de Tribolet. Études géologiques et chimiques sur quelques gisements de calcaires hydrauliques de l'Oxfordien et de l'Astartien du Jura neuchâtelois et vaudois. [Hydraulic Limestones, &c.] *Bull. Soc. Vaud. Sci. Nat.* ser. 2, vol. xiv. pp. 65–90.

These investigations of the hydraulic limestones of the Jura above Neuchâtel are confined to those of M. Oxfordian or L. Kimmeridgian age. Analyses were made of the best known; and they are classed, according to the amount of aluminium-silicate, as cements with 20–30 p. c., and two degrees of less strength as hydraulic limestones. The cement-beds of the Oxfordian form its middle division (M. Argovian), and are about 100 feet thick. Above the Corallian comes the Astartian, in which cement-beds again occur. Favourable analyses are given from localities not yet worked; and it is shown how this industry may be increased. E. B. T.

Knop, Dr. A. Il Lago di Posta nel circondario di Sora. *Boll. R. Com. geol. Ital.* vii. pp. 80–83. Translated from *N. Jahrb.* 1875, "Ueber die hydrographischen Beziehungen," &c. See GEOLOGICAL RECORD for 1875, p. 76.

Koch, Dr. A. Neue Beiträge zur Geologie der Frusca Gora in Ostslavonien. [Geology of Frusca Gora, E. Slavonia.] *Jahrb. k.-k. geol. Reichs.* Bd. xxvi. Heft 1, pp. 1–48.

The Palæozoic rocks consist of schists and limestones, and are followed by Cretaceous rocks without any intermediate deposits; they consist of sandstones, conglomerate, marl, and siliceo-dolomitic limestones, mostly of Gosau age: several sections are given, and fossils noted. Two serpentine layers occur, said to be the product of alteration of an Olivine-Enstatite rock, which must have been poured out in the Cretaceous sea; gabbro also occurs. These rocks are microscopically and chemically analyzed. Of Tertiary deposits Sotzka lignites, Sarmatian, &c., are described: the eruptive rock in connexion with the Neogene is classed as a Doleritic Phonolite, the result of analyses being given; it contains Nepheline, Sanidine, Amphibole, &c. E. B. T.

——. Geologische Beschaffenheit der am rechten Ufer gelegenen Hälfte der Donautrachytgruppe (Sct. Andræ-Visegrader Gebirgsstock) nahe Budapest. [Trachyte Group, right bank of Danube, near Pesth.] *Zeitsch. deutsch. geol. Ges.* Bd. xxviii. Heft 2, pp. 293–349, tab. 8.

Of the trachytes 7 varieties are described, chemical and microscopical analyses of each being given; they are grouped as acid, normal, and basic Labrador-Trachytes; the most abundant are the Labrador-

Amphibole-Augite-Trachyte and the Labrador-Augite-Magnetite-Trachyte. The sedimentary rocks of the district prior to the eruptions are:—U. Eocene (Tokoder sandstone), L. Oligocene (Kleinzeller clay), both with marine fossils; Oligocene freshwater-beds with lignite; U. Oligocene Cyrena-clay; *Anomia costata* sands (Neogene). Above comes over 300 feet of various Trachytic tuffs and breccias; the oldest is that of the Labrador-Biotite-Garnet-Trachyte, succeeded by the Labrador-Amphibole-Trachyte. The eruption of the doleritic Labrador-Augite-Trachyte comes at the beginning of the Sarmatian beds. Enclosed in small basin-like depressions of these tuffs are Plant-beds, probably Congerian. There are also Quaternary beds with trachytic material, perhaps redeposited, with *Ursus spelæus*. Tables show the classification adopted and dates of eruption. E. B. T.

Koch, Dr. G. A. Zur Geologie des Arlberges. Vorlage der geologischen Detailkarte der im Sommer 1875 abgesteckten Tunnelaxe am Arlberge. [Geology of the Arlberg. Report on the Geological detailed map of the Arlberg Tunnel line laid out in 1875.] *Verh. k.-k. geol. Reichs.* pp. 84–86.

The map referred to is on a scale of 1:2000. The paper will be printed in full in the *Jahrbuch*.

——. Vorläufige geologische Mittheilungen aus der Fervallgruppe. [Geological Notes on the Fervall Group.] *Verh. k.-k. geol. Reichs.* pp. 187–190.

Notes, together with an account of the original geological field-map of the region. The Fervall group is that "*massif*" which is surrounded by the Montafone, Zeynisjoch, Paznau, Stanzer, and Kloster valleys. G. A. L.

——. Aus dem Montafon. [Geology of Montafone.] *Verh. k.-k. geol. Reichs.* pp. 320–328, 343–345.

Koninck, Prof. L. G. de. [Report on **M. A. Renard's** Memoir "Sur la structure et la composition minéralogique du coticule et sur ses rapports avec le phyllade oligistifère."] *Bull. Ac. R. Belg.* sér. 2, t. xlii. pp. 462–473.

——. [Report on M. Mourlon's paper, "Sur l'étage dévonien des psammites du Condroz, etc."] *Bull. Ac. R. Belg.* sér. 2, t. xlii. pp. 829–831. See **Mourlon**, p. 97.

Kosmann, —. [The Lignite Formation of Hohe Flæming and the District N. of the Elbe, by Wittenberg.] *Zeitsch. deutsch. geol. Ges.* Bd. xxviii. Heft 3, pp. 647–649.

Krilova, A. Geologitcheskiya iziskaniya be Kostromskoi Gubernii. [Geology of the Government of Kostroma.] *Bull. Soc. Imp. Nat. Mosc.* t. l. pp. 210–234, woodcut section.

Describes the series of beds, with an analysis of rock by **Prof. P. A. Elvenkov.**

Kropotkin, P. [Researches on the Glacial Period.] *Iswest. Imp. Ross. Geogr. Obw.* vol. vii. pp. 827, with atlas of maps and woodcuts. *St. Petersburg.*

In two sections. Relates chiefly to the glacial phenomena of Finland, and especially to the *åsar*. The main conclusion is, that Finland was covered with an immense ice-sheet creeping from Scandinavia across the Gulf of Bothnia, and crossing Finland in a S.E. direction. There are no traces of marine conditions above the level of 120 feet. W. H. D.

Kvassay, Eugen v. Ueber den Natron- und Szekboden im ungarischen Tieflande. [Hungarian Soda-soils, &c.] *Jahrb. k.-k. geol. Reichs.* Bd. xxvi. Heft 4, pp. 427–446.

Szekboden is a sort of soil, mouse-grey when dry, black when moist, which nourishes only a very few plants. It forms the uppermost soil, occupies low ground, and is evidently the result of the washings of rhyolitic tuffs; it contains little lime, only traces of potassium and phosphoric acid, but occasionally large amounts of soda. The geographical area, chemical composition, &c. of these soda-soils are described, and their origin discussed. E. B. T.

Labat, A. La grotte de Monsummano (Toscane). [The Grotto of Monsummano, Tuscany.] Pp. 12. *Paris.*

——. Étude sur la station et les eaux de Montecatini, Italie (Toscane). [Station and Waters of Montecatini, Tuscany.] Pp. 24. *Paris.*

——. Étude sur la station et les eaux de Ragatz-Pfæffers. [Station and Waters of Ragatz-Pfæffers.] Pp. 30. *Paris.*

Lambert, Prof. G. Nouveau Bassin Houiller découvert dans le Limbourg hollandais, Rapport de. [New Coalfield in Dutch Limbourg.] Lithographed for private circulation, pp. 12, 2 maps, and plate of sections. 4to. *Louvain.* Abstract translation with notes, by **G. A. Lebour**, *Geol. Mag.* dec. 2, vol. iii. pp. 412–414. Translation in full, with plates, by **T. W. Bunning**, *Trans. N. Engl. Inst. Eng.* vol. xxvi. pp. 15–25, plates iv.–vi. (1877).

The new field is in the N. part of the Ruhr basin, under Permian, Cretaceous, and Tertiary beds; its N. limit is not yet known. Details of borings are given. W. H. D.

Lapparent, Alb. de. Note sur la relation des failles et des gisements éocènes du Nord de la France avec l'argile à silex. [On the Connexion between the Faults and the Eocene Deposits of N. France and the Clay-with-flints.] *Bull. Soc. Géol. France*, 3 sér. t. iv. pp. 348–351.

Shows that the Clay-with-flints of N. France is the result of purely chemical action.

Laspeyres, H. [Age of the Rhine Valley, etc.] *Zeitsch. deutsch. geol. Ges.* Bd. xxviii. Heft 2, pp. 397–404; woodcut (section).

Quotes from a former essay passages in favour of Lepsius's view, that the Rhine valley was not formed at the date assigned by Elie de Beaumont, but is post-Jurassic and perhaps Oligocene in date. Maintains that there is no discordance between the Vosges sandstone and the U. Bunter; the method of Platz, of taking altitudes and curves of strike, being too rigorous, and that a discordance not appreciable by a clinometer cannot be the proof of a great movement. E. B. T.

Lassen, T. Om Nikkelmalmen paa Ringeriget. [Nickel-ore at Ringeriget, Norway.] *Nyt Mag. Nat.* Bd. xxi. pp. 271–278.

The rocks of the district consist chiefly of hornblende-, mica-, and quartz-schist. The richest ore is at the Erteli mines, in which magnetic iron-pyrite with about 3 p. c. of nickel (and cobalt) is worked. The ore is at the junction of gabbro and quartz-schist. It seems to be a rule that magnetic iron-pyrite rich in nickel is almost only found in the neighbourhood of gabbro, and that the ore is of the greatest value in places where gabbro and quartzite are in contact. A plan of the mines is given, and lists of associated minerals and of localities. E. E. & H. M.

Laube, G. Notiz über Braunkohlenvorkommen im Erzgebirge. [Brown Coal in the Erzgebirge.] *Verh. k.-k. geol. Reichs.* pp. 329, 330.

Lebour, G. A. The Carrara Marbles. *Geol. Mag.* dec. 2, vol. iii. pp. 289–292.

History of opinions as to the age of the marbles, which have been regarded as Igneous, Cretaceous, Jurassic, Liassic, Triassic, and finally Carboniferous, as seen in 1845 by Coquand, whose views, based on stratigraphical evidence, were disregarded till lately, when they were proved correct by the discovery of fossils, of which a list is given.

W. H. D.

——. On the Geological Relations of the Secondary Iron-ores of France. *Trans. N. Engl. Inst. Eng.* vol. xxv. pp. 59–78, pls. xxix., xxx.

Describes the chief horizons of iron-ore and the distribution, under the heads—Cretaceous, Jurassic, Triassic, and ores of doubtful age. Gives a detailed table of formations in which the iron-bearing divisions are noted, and selected analyses of ores. The plates give a map, showing roughly the outcrop of the ore-yielding Secondaries, and sections.

G. A. L.

——. Geological Maps of France. *Geogr. Mag.* vol. iii. pp. 47, 48.

Gives an account of the progress of topographical geology in France from 1664, and a list of departmental geological maps, &c.

Lefèvre, Th. [Account of the Mont Cassel Excursion of the geological section of the French Association.] *Ann. Soc. Mal. Belg.* t. x. *Bull.* pp. xi–xiii.

——. Note sur la présence de l'ergeron fossilifère dans les environs de Bruxelles. [Occurrence of the fossiliferous "Ergeron" near Brussels.] *Ann. Soc. Mal. Belg.* t. x. *Bull.* pp. xxx–xxxiii. Noticed by mistake in the Geological Record for 1875, p. 391.

Lentéric, Charles. Les villes mortes du Golfe de Lyon. [The Dead Cities of the Gulf of Lyons.] Ed. 2. *Paris.*
Goes fully into the question of the variations of the coast-line.

Lepic, —. Sur le plateau de Soyons. [The Soyons Plateau.] *Bull. Soc. Anthrop. Paris*, 2 sér. t. xi. no. 1, p. 19.

——. Sur la caverne de Néron. [The Cavern of Nero.] *Bull. Soc. Anthrop. Paris*, 2 sér. t. xi. no. 1, p. 48.

——. Sur la grotte de Savigny. [The Savigny Cave.] *Bull. Soc. Anthrop. Paris*, 2 sér. t. xi. no. 1, p. 62.

Lepsius, Dr. R. *Zeitsch. deutsch. geol. Ges.* Bd. xxviii. Heft 2, pp. 394–396.
A letter in answer to Platz [see p. 104]. Maintains his position that the Black Forest and Vosges country owe their present form only to agencies acting since Tertiary times; since on he escarpments towards the Rhine, the Trias and Jura lie conformably on the Vosges sandstone, the Bunter period elevation [système du Rhin, Beaumont] has no existence in fact. E. B. T.

——. Die Eintheilung der alpinen Trias und ihr Verhältniss zur ausseralpinen. [Classification of Alpine Trias.] *N. Jahrb.* Heft vii. pp. 742–744.
Regards the *Avicula-Clarai* and *Ceratites-Cassianus* beds as Rothliegende, and not as Muschelkalk, having found in them the characteristic *Myophoria costata*. Proposes that beds between the Muschelkalk and Rhætics, now called U. Trias, should be distinguished as "Alpine Keuper." F. W. R.

——. [Elevation of the Hills of the Upper Rhine.] *N. Jahrb.* Heft vii. pp. 754, 755.
Refutation of Platz's views that these hills were raised and the Rhine valley formed in the Bunter period. Defence of modern views.

Levasseur, E. La France avec ses colonies. [France and her Colonies.] 12mo. With atlas of 124 maps.
Geology in its relation to the physical features of the regions described is much dwelt on, and serves as the basis from which the work is drawn up. G. A. L

Leymerie, Al. Note sur l'étage dévonien dans les Pyrénées. [Devonian in the Pyrenees.] *Bull. Soc. Géol. France*, 3 sér. t. iii. pp. 546–548.

Recognizes three Devonian divisions in Haute-Garonne. *Lower*: Limestones and calcareous schists with *Phacops* (rare) and Encrinital fragments. *Middle*: Amygdaloid calcareous schists passing to red or green marble, with small Goniatites in abundance (especially *G. retrorsus*), sometimes associated with *Clymeniæ*, Encrinite stems, and *Orthoceras*. *Upper*: Bluish schist shot with purple, red, and green, often slaty, and whitish grits passing to quartzite; apparently unfossiliferous. G. A. L.

——. Note sur le Garumnien espagnol. [Garumnian in Spain.] *Bull. Soc. Géol. France*, 3 sér. t. iii. pp. 548–553.

Chiefly an account of Señ. Vidal's work (see Geological Record for 1874, p. 104), which agrees with and confirms M. Leymerie's views with regard to the Catalan region. He considers the lacustrine limestone of Segura in Central Spain as Garumnian. G. A. L.

——. Notice sur le Pic-du-Gar. [The Pic-du-Gar.] *Rev. Sci. Nat.* t. iv. March No., pp. 16, plate.

This little Pyrenean mountain group near St. Béat (Haute-Garonne) is divided into three regions—the disturbed area (Cambrian and granitic), the area of repose (Silurian and Devonian), and the scarped area (Jurassic and Cretaceous). G. A. L.

Lielegg, Dr. Andr. Die geol. Verhältnisse Nieder-Oesterreichs zunächst zum Gebrauch an Lehrer-Bildungs-Anstalten. *Vienna.*

Limur, — de. Description du massif breton. [Description of the Breton Hills.] Pp. 24. *Saint-Brieuc.*

A short physical and geological description of Brittany.

Linnarsson, Prof. G. A Comparison between the Oldest Fossiliferous Rocks of Northern Europe. *Geol. Mag.* dec. 2, vol. iii. pp. 145–150. See also pp. 240, 287, 379.

Parallels the lowest Scandinavian fossiliferous rocks with the Longmynd Rocks. The Swedish Cambrians indicate deeper water than the British, although thinner. The lowest Russian Cambrians are older than the Tremadoc beds. W. H. D.

——. On the Vertical Range of the Graptolitic Types in Sweden. *Geol. Mag.* dec. 2, vol. iii. pp. 241–245.

Graptolites range from the Olenus Schists upwards to the Upper Graptolitic Schists; they are not known from the Ceratopyge Limestone or the Brachiopod Schists. The divisions in which each genus occurs are shown by a table. W. H. D.

——. On the Silurian Rocks of Sweden. *Geol. Mag.* dec. 2, vol. iii. pp. 525, 526.

The Swedish and Russian series correspond. The Swedish Dictyonema Schists pass down into the Olenus Schists (= Lingula Flags), than which the corresponding Russian beds cannot be newer. W. H. D.

Linnarsson, Prof. G. Geologiska iakttagelser under en resa på Œland. [Geological Observations in Œland, Sweden.] *Geol. Fören. Stockholm Förh.* Bd. iii. pp. 71–86.

The Primordial and Silurian rocks of Œland are described, stratigraphically and palæontographically.

Lippmann, —, and — Gurlt. [Boring at Hönigsen in Hanover.] *Rev. Géol.* in *Ann. Mines*, sér. 7, t. x. pp. 587–589.

From a private report to Prof. Delesse. Give measurements and details respecting a boring of more than 540 metres. The object was a search for petroleum; but the bore led to the discovery of large deposits of salt in the Middle Keuper. G. A. L.

Lippmann, —, and Ch. Lodin. [Account of a boring of 220 metres at Lisieux.] *Rev. Géol.* in *Ann. Mines*, sér. 7, t. x. p. 583.

The formations bored through are:—Soil, Corallian limestone, white sand (with water), marl, Oxfordian clay.

Lory, Ch. Compte-rendu des observations faites sur les Alluvions anciennes et les dépôts glaciaires du Bois de la Bâtie. [Ancient Alluvia and Glacial Deposits of the Wood of La Bâtie.] *Bull. Soc. Géol. France*, 3 sér. t. iii. pp. 723–727, figure in text.

This locality is on the left bank of the Arve, at its confluence with the Rhône. The steep bank shows a section (from below upwards) as follows:—Clay with fossil wood, old pebbly alluvium, intercalated sheet of glacial mud, old alluvium again, second and general sheet of glacial mud, stratified clayey loam. These facts are explained, not by the assumption of two glacial epochs, but by the advancing and receding phases of glaciers in Quaternary as in modern times. The old alluvia were deposited in advance of the glaciers by great rivers issuing from them. G. A. L.

——. Sur la structure géologique de la vallée de Chamonix. [Geological structure of the Chamouni Valley.] *Bull. Soc. Géol. France*, 3 sér. t. iii. pp. 783–788.

Résumé of the author's views respecting the physical history of that portion of the Alps. Explains the fan-shaped structure of the Mt. Blanc group by lateral pressure. Believes the bedded gneiss and protogine granite of parts of the district to have been originally deposited horizontally as sedimentary rocks. G. A. L.

——. Sur les variations minéralogiques des Schistes cristallins dans les Alpes occidentales. [Mineralogical Variations of the Crystalline Schists in the W. Alps.] *Bull. Soc. Géol. France*, 3 sér. t. iii. pp. 794–797.

A stratigraphical rather than a petrological paper.

Lory, Ch. Les Gisements de Phosphates du Sud-Est de la France. [Phosphates of S.E. France.] *Compt. Rend. Assoc. France*, 1875, p. 676, abstract.
The deposits are Cretaceous.

Lossen, K. A. [Notes on Rocks of the Brocken.] *Zeitsch. deutsch. geol. Ges.* Bd. xxviii. Heft 2, pp. 405–414.
On schorl-bearing quartz-porphyries and other dykes with a sphærolitic structure belonging to the Granite-mass of the Brocken.

——. [On the Rammelsberg Hill.] *Zeitsch. deutsch. geol. Ges.* Bd. xxviii. Heft 4, p. 777.
Preliminary note on the deposition of ores in the Rammelsberg, near Goslar. It is held that they have been subsequently introduced, lentiform cavities being formed during movements of the beds, and filled from solutions. E. B. T.

Lotti, B. Sui terreni miocenici lignitiferi del Massetano (Maremma toscana). [Miocene Lignites of the Massetano.] *Boll. R. Com. geol. Ital.* vii. pp. 31–39.
In the Massa district the L. Miocene is absent; the beds are either Eocene or M. Miocene and upwards. The section in descending order is:—Plastic clays with some lignite bands; arenaceous clays and pudding stones (marine); red conglomerates; grey clay (*Mattajone*); bituminous limestones with *Dreissena Brardi*; two valuable lignite beds, 3–8 feet, which yield coke by burning; Eocene rocks. E. B. T.

——. Il Poggio di Montieri (in provincia di Grosseto). [The Montieri Hill.] *Boll. R. Com. geol. Ital.* vii. pp. 111–122, woodcut.
The hill of Montieri, 1050 m. above sea-level, was formerly worked for silver, but abandoned since 1355. The hill consists of an arch of alberese [Eocene], below which are nummulite beds, followed in descending order by a conformable arenaceous series (probably Cretaceous); then come variegated clay-shales with fucoids, next a red limestone, and then (only seen in mining-operations) the metalliferous limestone, which is white, cryptocrystalline, and appears to be L. Lias. Fresh headings are now being driven, which prove the hill to be honeycombed with the old workings; enough rich argentiferous galena and blende has been found to induce a prosecution of the research. The ore occurs in a very irregular way, as it were cementing together blocks of the white limestone, which is without bedding. E. B. T.

——. Sul giacimento ofiolitico di Rocca Sillana. [Ophiolitic Rocks of Rocca Sillana.] *Boll. R. Com. geol. Ital.* vii. pp. 289–293.
Describes the serpentine and associated rocks of Rocca Sillana at the extreme S.E. of the province of Pisa. The mass is wrapped round by the Pliocene, which reaches the height of 450 m. above sea-level. E. B. T.

——. Osservazioni geologiche di una breve gita all' Isola dell' Elba.

[Geological observations in Elba.] *Boll. R. Com. geol. Ital.* vii. pp. 403–410.

Enumerates the formations of the island. Shows that the iron-ores occur at the base of the cavernous limestone which lies above the quartzites; similar ores occur on the mainland opposite in an identical limestone and under similar circumstances, except that the formations below differ. E. B. T.

Ludwig, R. Braunkohle bei Messel. [Brown Coal, Messel.] *Notizbl. Ver. Erdk. Darmstadt,* Folg. 3, Heft 15, p. 1.

Lundgren, B. Om Belemniterna i Sandkalken i Skåne. [Belemnites in the "Sandkalk" (a subdivision of the Swedish Cretaceous) in Scania.] *Œfv. K. Vet.-Akad. Förh.* No. 10, pp. 15–21.

An account of the occurrence and fossiliferous character of the beds in which *Belemnites mucronatus* and *B. subventricosus* are found. Notes as to the relative ages of the subdivisions of the Swedish Cretaceous beds are given. E. E.

Macar, T. de. Sur les relations existant entre la composition et le gisement des charbons du Bassin de Liége. [Relations between the Composition and the Lie of the Coals of the Liége Coal-field.] *Ann. Assoc. Ing. Liége*, sér. 2, t. vi. pp. 57–82.

Based on 250 analyses of coals from this region. The laws applicable to ordinary coal-fields connecting chemical composition with geological position do not hold in so disturbed a basin as that of Liége. Empirical rules of use in practice can, however, be arrived at even here. A. R.

Macpherson, —. Sobre las Rocas eruptivas de la provincia de Cadiz y de su semejanza con las Ophitas del Pirineo. [Eruptive Rocks of the Province of Cadiz, &c.] Pp. 22, plate. *Madrid.*

Maffei, E. Minas de Carbon de Aller en Asturias. [Coal-mines of Aller in the Asturias.] *Rev. Min.* ser. B, t. ii. nos. 49–53, pp. 101, 109.

Magnin, A. Recherches géologiques, botaniques et statistiques sur l'Impaludisme dans la Dombes et le Miasme Paludéen. [Geological, ... Researches on the Marsh-emanations of the Dombes Plateau (near Lyons).] Pp. 120, plate. *Paris.*

Maier, —. [Copper-mines of the Ural in the mining district of Nijnetagilsk.] *Gornoi Journ.* vol. iii. pp. 290–299; 3 pls. (sections).

Malaise, Prof. C. [Discovery of *Oldhamia* in the Devillian Beds of Grand-Halleux.] *Ann. Soc. Géol. Belg.* t. iii. *Bull.* p. lxx.

——. Sur quelques fossiles du Diluvium. [Fossils (rolled) from the Drift.] *Ann. Soc. Mal. Belg.* t. x. *Bull.* pp. lv, lvi.

Malaise, Prof. C. Excursion géologique et botanique de la Société R. linnéenne dans la vallée de l'Orneau, de Gembloux à Mielmont (Onoz) et de Mielmont à Bovesse, le 7 Juin, 1874. [Account of Excursion, etc.] Pp. 12. *Brussels.*

——. [Report on **M. Mourlon's** paper "Sur les dépôts dévoniens rapportés par Dumont à l'étage quartzo-schisteux inférieur de son système eifélien, ..."] *Bull. Ac. R. Belg.* sér. 2, t. xli. pp. 240–246.

——. [Report on **Prof. Gosselet's** paper "Quelques réflexions sur le calcaire eifélien."] *Bull. Ac. R. Belg.* sér. 2, t. xli. pp. 1156–1158. [See **Gosselet**, p. 69.]

——. [Report on the **Rev. M. A. Renard's** memoir "Sur la structure et la composition minéralogique du coticule et sur ses rapports avec le phyllade oligistifère."] *Bull. Ac. R. Belg.* sér. 2, t. xlii. pp. 473–475.

——. [Report on **M. Mourlon's** paper "Sur l'étage dévonien des psammites du Condroz dans la vallée de la Meuse entre Lustin et Hermeton-sur-Meuse."] *Bull. Ac. R. Belg.* sér. 2, t. xlii. pp. 835, 836.

Malherbe, Renier. Observations sur l'allure du système houiller entre Mélen et Charneux. [Lie of the Coal Measures between Mélen and Charneux.] *Ann. Soc. Géol. Belg.* t. iii. pp. 80–83; with Report by **Alph. Briart**, pp. 84–88.

A note of local synonymy of coal-seams, additional to a memoir on the Liége Coal-field, in course of publication.

——. De la stérilité du système houiller entre Saive, Jupille et La Xhavée. [Sterility of the Coal Measures between Saive, Jupille, and La Xhavée.] *Ann. Soc. Géol. Belg.* t. iii. pp. 89–94.

Discusses the horizon of the beds in the area, with reference to well-known coal-seams of the surrounding district, the area being bounded by faults. G. A. L.

——. Des horizons coquilliers du système houiller de Liége. [Shell Beds in the Coal Measures of Liége.] *Ann. Soc. Géol. Belg.* t. iii. *Bull.* pp. lxvii, lxviii.

Adds a few unrecorded Coal Measure shell-bands to those already known. The shells are *Cardiniæ* [*Anthracosia*?]. 13 horizons of the kind are known in the Liége coal-field. G. A. L.

——. Note sur la rencontre d'une faille transversale dans la galerie Est des eaux alimentaires de la ville de Liége. [Occurrence of a Fault across the E. Drift of the Liége Waterworks.] *Ann. Soc. Géol. Belg.* t. iii. *Bull.* pp. lxxvii, lxxviii.

The throw and hade of this fault are unknown; and Prof. Dewalque and others in discussing it [p. lxxix] suggest that probably it is a mere fissure. G. A. L.

Mallard, Er. Des oscillations séculaires des Glaciers et des variations qu'elles accusent dans les éléments météorologiques du Globe. [Secular Oscillations of Glaciers and the Variations to which they point in the Meteorological Agents of the Earth.] *Bull. Soc. Géol. France*, 3 sér. t. iv. pp. 69–73.

Some Alpine glaciers are decreasing, whilst others are extending. In the Alps each successive year becomes warmer and at the same time more snowy. Thence the inference that the Glacial period was due to increase of snow, and was therefore a rainy period. G. A. L.

——. Réponse aux observations de **M. Gruner.** [Reply to **M. Gruner.**] *Bull. Soc. Géol. France*, 3 sér. t. iv. pp. 82, 83.

Maintains the exactness of his views.

Manzoni, A. Lo "Schlier" di Ottnang nell' Alta Austria, e lo Schlier delle colline di Bologna. [The "Schlier" of Upper Austria and that of the Bolognese Hills.] *Boll. R. Com. geol. Ital.* vii. pp. 122–133; 2 woodcuts.

The Miocene grey and blue marls of Paderno and San Luca have been recognized as identical with the "*Schlier*" of Austria. The section along the Reno Valley, near Bologna, shows it reposing on the *argille scagliose* everywhere, so that it is there the lowest of the Mio-pliocene deposits; above it come sands and gravels of the L. Pliocene, near Sasso, or Miocene molasse in the hills of Vergato, &c.; in both cases there is a passage. Fossils show that the Schlier was deposited in a deep sea; a part of the sea-floor being then gradually raised, the deposits forming in shallower water around the coast became the U. Miocene molasse, while at a subsequent stage a continuation of this rise in Pliocene times gave rise to the passage into the L. Pliocene beds. E. B. T.

——. Della posizione stratigrafica del calcare a *Lucina pomum*, Mayer. [Stratigraphical Position of the *L. pomum* Limestone.] *Boll. R. Com. geol. Ital.* vii. pp. 209–216, woodcut.

Determines the horizon of this fossil. It occurs in a thin limestone at the base of the gypsum, which is below the Pliocene sands and marls; its position is the same at Brisighella, near Faenza, and near Bologna. The section given shows the gypsum to lie above the "Schlier," but separated by the Lucina-bed, as well as by yellow marls. E. B. T.

Martin, Jules. [On the Virgulian and Portlandian Beds of Flacey, Côte-d'Or.] *Mém. Ac. Sci. Dijon*, sér. 3, t. iv. Abstract in *Rev. Géol.* for 1875–76; *Ann. Mines*, sér. 7, t. x. pp. 557, 558.

Massart, A. Descripcion de los Criaderos metaliferos del distrito de

Cartagena. [Metalliferous Deposits of the Carthagena District.] *Revista Minera*, ser. B, t. ii. pp. 16, 53, 61, 77.

Massart, A. Minerales de Estano en los terrenos secundarios. [Tinores in the Secondary Rocks.] *Rev. Min.* sér. B, t. ii. p. 87.

Matheron, Phil. Note sur les dépôts crétacés lacustres et d'eau saumâtre du Midi de la France. [Lacustrine and brackish Cretaceous Deposits of S. France.] *Bull. Soc. Géol. France*, sér. 3, t. iv. pp. 415–428.

These deposits, formerly regarded as representing the Lower Eocene of the Paris Basin, had been shown by the author to be in part Cretaceous. The inquiry is here continued, and the following conclusions arrived at:—1. The great series of red argillites, with subordinate breccias and the underlying Rognac beds (freshwater) in the S.E. of France and in N.E. Spain, are the equivalents of the Garumnian of the Upper Garonne; 2. The same red indurated clays are the highest Cretaceous beds of the district, the overlying *Physa* beds of Langesse and Montolieu forming the base of the Tertiary deposits, and being looked upon as the equivalent of the Nummulitic series of the U. Garonne.

G. A. L.

Maupier, —. Notice sur la brêche du Mont-Crépon. [Breccia of Mt. Crépon.] *Rev. Géol.* in *Ann. Mines*, sér. vii. t. x. p. 550; abstract.

This breccia contains, amongst other rocks, fragments of Anthraciferous grits of the Roannais. It may therefore be regarded as the limit between those grits (which are equivalent to the coal-bearing beds of Anzin and Mons) and the Coal Measures of St. Etienne and Rive-de-Gier.

G. A. L.

Mayer, Charles. La vérité sur la Mer Glaciale au pied des Alpes. [The Truth respecting the Glacial Sea at the Foot of the Alps.] *Bull. Soc. Géol. France*, 3 sér. t. iv. pp. 199–222.

Begins with a stratigraphical introduction with lists of fossils, then describes in detail the deposits of Balerna and Fino (or Bernate). Gives a table illustrating his views of the correlation of the beds. Controverts the theory that huge glaciers may have flowed down into the Astian Sea, the temperature of which was that of the Red Sea. Retracts his former opinion that the Fino beds are L. Astian. The fauna of these beds consist of *rolled* L. Astian and of fresher-looking U. Astian shells. The pebbles of the deposit have a fluviatile and not a glacial aspect.

G. A. L.

Mehner, —. Die Gewinnung von Steinsalzsoole durch Bohrlöcher bei Schönebeck. [The Working of Salt by Bore-holes and Brine-pumps at Schönebeck.] *Zeitsch. Berg-, Hütt. Salinenw.* Bd. xxiv. *Abh.* pp. 11–35, pl. *a*.

Describes the working of a deep-seated series of deposits of rock-salt at Schönebeck on the Elbe. There are two beds of undetermined thickness between the Zechstein and Muschelkalk, which have been

discovered by boring, the strata being everywhere covered by Tertiary and superficial deposits. Between 1849 and 1871, 10 bore-holes have been put down, 6 of which, varying from 1300 to 1850 feet in depth, have been productive of strong workable brine; but the supply being insufficient, a shaft has been commenced in order to work the salt by regular mining. H. B.

Mercey, N. de. Sur la craie de Lézennes. [The Lézennes Chalk.] *Ann. Soc. Géol. Nord*, t. iii. pp. 149, 150.

Thinks that this Chalk belongs to the *Micraster coranguinum* zone.

——. Géologie résumée des cantons de la Somme: Amiens (suite). [Geology of Amiens.] *Bull. Soc. Linn. N. France*, No. 48, p. 84.

A continuation. See GEOLOGICAL RECORD for 1874, p. 82, and for 1875, p. 83.

Mestorf, J. La caverne ossifère dite Kesslerloch, à Thayngen, près Schaffhouse. [The Kesslerloch Bone-cave.] *Mat. Hist. Homme*, 2 sér. t. vii. p. 97.

Meugy, —. Sur un terrain remanié recouvrant le Gault dans la commune de Saulces-Monclin (Ardennes). [Reassorted Deposits covering the Gault in the Commune of Saulces-Monclin, Ardennes.] *Bull. Soc. Géol. France*, 3 sér. t. iv. pp. 6, 7.

Note of occurrence of drift or alluvium.

——. Note sur le prolongement des couches du terrain crétacé dans la partie nord-ouest du département des Ardennes. [Extension of the Cretaceous Beds in N.W. Ardennes.] *Bull. Soc. Géol. France*, 3 sér. t. iv. pp. 8–13.

Points out the changes which characterize the beds between the "Gaize" and the white Chalk between Monthois, S. of Vouziers, and Chaumont-Porcien, N.W. of Rethel. These changes are rather lithological than palæontological. G. A. L.

Meunier, Dr. Stanislas. Tableau synoptique résumant la distribution des Mollusques fossiles dans les couches tertiaires du bassin de Paris. [Table showing the Distribution of Shells in the Paris Tertiaries.] *Compt. Rend.* t. lxxxiii. p. 1054.

——. Sur un bloc de Meulière recueilli dans le sable éruptif des environs de Beynes. [Block of "Meulière" found in the Eruptive Sand near Beynes.] *Compt. Rend.* t. lxxiii. p. 576.

——. Faits pour servir à l'histoire des Puits naturels. [Facts relating to Natural Pits.] *Compt. Rend.* t. lxxiii. p. 164.

Meyn, Dr. L. Der Bernstein der norddeutschen Ebene auf zweiter, dritter, vierter, fünfter und sechster Lagerstätte. [Amber in the N. German plain.] *Zeitsch. deutsch. geol. Ges.* Bd. xxviii. Heft 2, pp. 171–198.

The primary deposit of Amber is usually assumed to be the blue clay of the M. Oligocene (glauconitic). Thence derived, it is deposited secondarily in the Samland lignite-beds, also Oligocene; thirdly, in marine Miocene beds in Schleswig-Holstein; fourthly, in the widely spread lower Drift, in fossiliferous marls free from shingle, which is the chief source, as this division extends from E. Mecklenburg to the Danish Islands and Windschoten in Holland; the yield is estimated at 1 lb. per square metre of surface. It is redeposited, fifthly, in the boulder beds (of Northern origin) over N. Germany, being in divisions of Glacial drift which consist of sand, loam, gravel, &c. with erratics; amber is found in this from the Russian border to Holland. Sixthly, it is found on the sands between tides, thrown up by the waves and washed out of the coast-alluvium or marsh-formation, which, again, was formed by the elutriating action of the sea on the materials of the Drift. E. B. T.

——. Geognostische Beschreibung der Insel Sylt und ihrer Umgebung nebst einer geognostichen Karte im Maassstabe von 1 : 100000. [Geological Description of Sylt and the Neighbourhood.] *Abh. geol. Spezialkarte Preuss.* Bd. i. Heft 4, pp. 605–759; 2 folding pls. of sections and views.

Describes the Tertiary and Quaternary beds of Sylt, Amrum, Föhr, Romö, the mainland, and the Marsh Islands (Pelworm, Nordstrand, &c.)

Miaulis, Capt. [Notice of the Occurrence of a Submarine Crater within the Harbour of Karavossera, in the Gulf of Arta.] *Quart. Journ. Geol. Soc.* vol. xxxii. *Proceedings*, pp. 123, 124.

A small crater still yielding sulphur, especially during S. winds. Eruptions occurred in 1847 and 1865.

Moeller, V. von. Sur la constitution géologique de la partie méridionale du gouvernement de Nijni-Novgorod. [Geology of the S. Part of the Government of Nijni-Novgorod.] *Bull. Soc. Géol. France*, 3 sér. t. iv. pp. 324–326; and in Russ., 8vo, *St. Petersburg.*

An analysis of the Russian work by **G. Dollfus.** The formations included in the district are:—Upper Carboniferous Limestone series; Permian; Trias; Jurassic, resting unconformably upon the first two; Drift and Alluvium. Short lists of fossils are given. G. A. L.

——. Geologitheskii otcherke okrestnostéi Aleksandrovskago éaboda, na Ouralé. [Geological Observations near Alexandrovsky, Ural.] Pp. 60; 2 plates. *St. Petersburg.*

——. Neskoleko slove o Phosphoritache Nijegorodskoi Gubernii. [Phosphorite-deposits of the Novgorod Government.] 6 pp. *St. Petersburg.*

Moesta, Friedrich. Blatt Waldkappel. [Waldkappel Sheet of the Geological Map of Prussia.] *Erläut. geol. Spezialkarte Preuss.* Gradabth. 55, No. 52, pp. 24.

Comprises Permian, Trias, Diluvium, Alluvium, and Basalt.

Moesta, Friedrich. Blatt Netra. [Netra Sheet of the Geological Map of Prussia.] *Erläut. geol. Spezialkarte Preuss.* Gradabth. 55, No. 59, pp. 28, pls. 25, 27 (sections).
Describes Permian, Trias, and Alluvial deposits.

——. Blatt Hönebach. [Hönebach Sheet of the Geological Map of Prussia.] *Erläut. geol. Spezialkarte Preuss.* Gradabth. 69, No. 4, pp. 20.
Remarks on Permian, Trias, Tertiary, Drift, Alluvium, and Basalt; with analysis of Permian dolomite [Gypsäquivalente].

——. Blatt Gerstungen. [Gerstungen Sheet of the Geological Map of Prussia.] *Erläut. geol. Spezialkarte Preuss.* Gradabth. 69, No. 5, pp. 14.
Gives details of Permian, Trias, Tertiary, Drift, Alluvium, and Basalt.

——. Blatt Eschwege. [Eschwege Sheet of the Geological Map of Prussia.] *Erläut. geol. Spezialkarte Preuss.* Gradabth. 55, No. 53, map and 2 sections.
Describes Permian, Trias, and Drift.

Möhl, H. Neue geologische Aufschlüsse in der Stadt Cassel. [New Sections in Cassel.] *N. Jahrb.* Heft vii. pp. 724–730.
Gives details of sections exposed in making new streets in Cassel. Describes the basalt of the Katzenberg and the Weinberg. A basalt-tuff is remarkable for its richness in marine Middle Oligocene shells. 24 species are cited. F. W. R.

Möhn, H. Bidrag til kundskaben om gamle Strandlinier i Norge. [Old Coast-lines in Norway.] *Nyt Mag. Nat.* Bd. xxii. pp. 1–53, figures in text.
Made chiefly from shipboard, during a sounding-voyage between Bergen and the Varanger Fjord, these observations do not pretend to exactitude. Careful analysis, however, brings out clearly the number and general level of the better-defined coast-lines. The Tromsö group, between Ofoten and Karlsö, is reduced to 7 levels, between 62 and 304 feet above the sea; the Alten group (Altenfjord to Kralsund) to 5 levels, between 73 and 186 feet; in E. Finmark and Varanger Fjord to 5 levels, between 83 and 293 feet; in the Diocese of Trondhjem to 3 levels, from 304 to 509 feet; and in the Diocese of Bergen to 3 levels, from 58 to 280 feet. The Tromsö and Alten coast-lines group chiefly at lower levels; in the former area they are most numerous and preserved in the largest segments. The Trondhjem lines are eminently high, those of Bergen again tallying better with the northern groups. The coast-line deepest excavated is that beside the town of Trondhjem, which is a step cut 50 feet in rock. H. M.

Mojsisovicz, Dr. Edm. v. Die Triasbildungen bei Recoaro im Vicentinischen. [Trias of Recoaro in the Vicentino.] *Verh. k.-k. geol.*

Reichs. pp. 238–241. Translated in *Boll. R. Com. geol. Ital.* t. vii. p. 490.

The *Naticella costata* beds of S.E. Tyrol are wanting at Recoaro; and their place seems to be taken by the "Muschelkalk of Recoaro," which in its turn is wanting in S.E. Tyrol. The other divisions of the latter district are present in the former. G. A. L.

Mojsisovics, Dr. Edm. v. Vorlage der geologischen Specialkarte des südöstlichen Tyrols und der Provinz Belluno. [Notice of the Geological Map of S.E. Tyrol and the Province of Belluno.] *Verh. k.-k. geol. Reichs.* p. 347.

An introductory note.

Mortillet, G. de. La grotte de l'Herm. [Cave of l'Herm.] *Bull. Soc. Anthrop. Paris*, 2 sér. t. xi. no. 6, p. 818.

——. Superposition du Solutréen au Moustiérien, à Thorigné (Mayenne). [The Solutrean above the Moustierian at Thorigné, Mayenne.] *Mat. Hist. Homme*, 2 sér. t. vii. pp. 164–167.

Mourlon, Michel. Sur les dépôts dévoniens rapportés par Dumont à l'étage quartzo-schisteux inférieur de son système eifélien, avec quelques observations sur les affleurements quartzo-schisteux de Wiheries et de Montignies-sur-Roc. [Devonian Deposits referred by Dumont to the lower quartzo-schistose division of his Eifelian system; with Remarks on the quartzo-schistose Outcrops of Wiheries and Montignies-sur-Roc.] *Bull. Ac. R. Belg.* sér. 2, t. xli. pp. 323–345, plate (sections).

Discusses the views of various authors respecting the N. band of the Dinant basin. Describes in detail sections in this region which confirm Gosselet's results (*Ann. Sci. Géol.* 1873, t. iv.). Describes further sections near Wiheries and Montignies-sur-Roc, with the object of suggesting the probable L. Devonian age of rocks shown in them, before looked upon as Silurian. Suggests that the presence of felspar in the grit of these localities and of Ause is favourable to this view. Details of sections form the bulk of the memoir. G. A. L.

——. Sur les dépôts qui, aux environs d'Anvers, séparent les sables noirs miocènes des couches pliocènes scaldisiennes. [Deposits near Antwerp which separate the black Miocene sands from the Scaldisian Pliocene beds.] *Bull. Ac. R. Belg.* sér. 2, t. xlii. pp. 760–790, coloured folding plate of sections.

Considers as U. Miocene the black sands of Edeghem and Antwerp, which M. Vanden Broeck refers to the L. Pliocene. Gives details of many sections and lists of fossils. Many of these sections are only temporarily open. G. A. L.

——. Sur l'étage dévonien des psammites du Condroz dans la vallée de la Meuse, entre Lustin et Hermeton-sur-Meuse. [The Condroz sandstones in the Meuse Valley, between Lustin and Hermeton-

sur-Meuse.] *Bull. Ac. R. Belg.* sér. 2, t. xlii. pp. 845–884; large folding plate of sections.

There are 4 bands of these rocks in this region :—that of Lustin, in which the Monfort division "C" is alone present; that of Yvoir, where the Monfort and Esneux divisions "C" and "A" appear, those of Souverain-Pré (?) "B" and Évieux "D" being absent; that of Anseremme, where A, B, C are present, but not D; and that of Hastières, where A, B, D but not C are seen. Many sections are described. G. A. L.

Nathorst, A. G. Om förekomsten af kalcedonartad jaspis vid Ottarp i Skåne. [Occurrence of chalcedonic Jasper at Ottarp in Scania.] *Geol. Fören. Stockholm Förh.* Bd. iii. pp. 167–169.

In a loose brown-red sandstone, probably Triassic, lie layers and lenticular masses of a rose-red or light red, sometimes yellowish-white jasper, not exceeding five Swedish feet in length. E. E.

Neumayr, Dr. M. Die Ornatenthone von Tschulkovo und die Stellung des russischen Jura. [Russian Jurassic, &c.] *Benecke's geogn.-pal. Beiträge*, Bd. ii. Heft 3, pp. 319–348, plate 25.

A collection from Tschulkowo gave 5 Ammonites identical with W. European forms; a re-examination of species described by Trautschold shows that the lower beds with *Ammonites alternans* do not represent any part of the L. Oolite as that author thought; for the fauna is that of the Kallovian and Oxfordian. The beds above these contain indigenous forms not found in W. Europe, so that the U. Jurassic are not to be paralleled with the same precision. The changes of land and sea in Russian Jurassic time are enumerated thus :—1. Crimo-Caucasian phase, prior to Kallovian times a partial incursion of sea eastwards, laying down marine beds with Belemnites (Lias, &c. being mostly of freshwater facies in the east). 2. Sea-communication with mid-Europe in Kallovian times. 3. Continued immigration of W. European forms, mixed with others from India. 4. Severance from western seas and indigenous fauna. 5. Extension of sea northwards.

The new species described are :—*Perisphinctes Scopinensis* from the Ornatus-beds, and *Waldheimia Trautscholdi* from the glauconitic limestone. E. B. T.

——. Das Schiefergebirge der Halbinsel Chalkidike und der thessalische Olymp. [The Schist-group of Chalkis, &c.] *Jahrb. k.-k. geol. Reichs.* Bd. xxvi. Heft 3, pp. 249–260, woodcut.

The peninsula of Chalkis consists of chloritic schists, gneiss, &c., with which crystalline marbles are associated, the whole bent into one chief fold, with several minor ones causing repetitions; a considerable thickness of these marbles is seen in Mt. Athos. Similar limestones at Hymettus, Acropolis of Athens, &c. have yielded Secondary fossils; therefore, as the metamorphic schists in N.E. Greece are Cretaceous, it is probable that the similar beds of E. Thessaly are so also. E. B. T.

Neumayr, Dr. M. Die Halbinsel Chalkidike. [The Chalkis Peninsula.] *Verh. k.-k. geol. Reichs.* p. 45.

Tertiary deposits occur above the older rocks (see above).

Neumayr, Dr. M., Dr. Al. Bittner, and **Fr. Teller.** [Letters from N. Greece.] *Verh. k.-k. geol. Reichs.* pp. 219–227.

The letters are dated Chalkis (Eubœa), Lamia, Livadia, and Missolonghi; and geological notes of the regions thus indicated are given.

Nicholson, Prof. H. A. Notes on the Correlation of the Graptolitic Deposits of Sweden with those of Britain. *Geol. Mag.* dec. 2, vol. iii. pp. 245–249, pl. ix.

Correlates the *Olenus* and *Dictyonema* schists with the Tremadoc Slates, the L. Graptolitic Schists with the Skiddaw Slates and Quebec group, the Middle Graptolitic Schists with the L. Moffat Shales, and the U. Graptolitic Schists with the Coniston Mudstones, Skelgill series, or U. Moffat Shales. The U. Graptolitic Schists are partly of the age of the Coniston Flags and Grits (U. Silurian). A list of Swedish species is given.

Divides his genus *Dichograptus* into 4 genera, giving diagnoses—*Trichograptus*, *Schizograptus*, *Temnograptus*, and *Ctenograptus*, all from the Skiddaw Slates. W. H. D.

Niedźwiedźki, J. Beiträge zur Geologie der Karpathen. [Geology of the Carpathians.] *Jahrb. k.-k. geol. Reichs.* Bd. xxvi. Heft 3, pp. 331–342. Abstract in *Verh. k.-k. geol. Reichs.* p. 237.

Notes the discovery at Przemyśl of Ammonites with a Neocomian facies; also of blocks of Stramberg limestones (= an outlier 160 kilometres from the main area). E. B. T.

Nivoit, —. Sur les Phosphates de Chaux du Terrain Crétacé dans le Nord de la France et la Belgique. [Cretaceous Phosphates of Lime of N. France and Belgium.] *Compt. Rend. Assoc. Franç.* 1875, pp. 662–676.

Describes the phosphate-bearing zones, the nature of the nodules (analyses of 9), their origin, mode of extraction, quantity, &c.

Nolan, Joseph. Notes of a Geological Tour through the Siebengebirge and the Lower Eifel. *Journ. R. Geol. Soc. Ireland*, ser. 2, vol. iv. pt. 3, pp. 124–131.

The Siebengebirge have in general a conoidal form, and are mostly formed of trachyte with protrusions of basalt and dolerite, in some cases apparently filling up old volcanic vents. The trachyte varies from the porphyritic sanidine-trachyte of the Drachenfels to the trachy-dolerite at the Löwenberg. That of the Wolkenberg is composed chiefly of oligoclase with some hornblende and biotite, the last mineral being common in places, apparently replacing the hornblende. In the L. Eifel, the trass of the Brohl valley is a *moya* or *débâcle* of pumiceous mud, enclosing charred branches and fragments of trees, derived from ancient pre-volcanic forests. Its most probable source was the old

crater of the Laacher See. The occurrence of zircon is noted in the greystone lava of Niedermendig. The outcrop of this lava-bed was observed at Thür, from which village to the Hochstein it forms a well-defined ridge; and the author refers the source of the lava to the latter volcano. The Hochzimmer and Bellerberg volcanoes are described. The latter seems to have been formed within the crater of a much larger one, of which some remnants were observed. These eruptions seem to have been among the oldest in the district. E. T. H.

Nordenfelt, Thorsten. Notes on Iron-ore Deposits at Naeverhaugen, near Bodœ, Norway. *Journ. Iron Steel Inst.* pp. 149–155.

The deposits rise 600 feet above the surrounding level, and extend more than 6 miles. Layers of limestone, eurite, mica-schist, and a grey gneiss are found in association with the ironstone. Magnetic ore sometimes occurs in the surrounding eurite and limestone; the ironstone is almost entirely specular. The ore resembles brown or red hæmatite, though it belongs to an older formation than the English hæmatites. Analyses are given. R. B. N.

Nordenström, G. Ytterligare meddelanden om Solstads koppargrufva i Småland. [Additional Account of Solstad Copper-mine, Småland, Sweden.] *Geol. Fören. Stockholm Förh.* Bd. iii. pp. 2–8; 2 plates.

Describes the shaft-sinking and level-driving made in order to reach the lode, which at 800 feet below the surface had suddenly thinned out. The vein was found again in a level 1000 feet below the surface, but 200 feet to W.N.W., the dislocation being occasioned by a great reversed fault. Some notes as to faults in other Swedish mines are given. A section showing the situation and dislocation of the vein is given on a scale of 1 : 1600, and a plan on the same scale. E. E.

Novov, —. [Coal-beds in the W. District of the Donetz Hills.] *Gornoi Journ.* vol. iii. pp. 93–112, 4 pls. (sections).

Ochsenius, —. Ueber die Salzbildung der Egeln'schen Mulde. [Salt-formation of the Egeln Basin.] *Zeitsch. deutsch. geol. Ges.* Bd. xxviii. Heft 3, pp. 654–666.

Brings forward some theoretical considerations as to the manner in which salt-deposits are formed, and applies these to the N. German basin, in which, besides salt, potash minerals form such a valuable feature, with gypsum, anhydrite, &c. E. B. T.

Omboni, G. Delle antiche Morene vicine ad Arco nel Trentino. [Old Moraines near Arco.] *Atti R. Ist. Ven. Sci.* ser. 5, t. ii. pp. 11.

——. Di due antichi ghiacciaj che hanno lasciato le loro traccie nei Sette Comuni. [Traces of Extinct Glaciers.] *Atti R. Ist. Ven. Sci.* ser. 5, t. ii. pp. 6.

——. Come s'è fatta l'Italia : saggio di geologia popolare. [Popular Account of the Geology of Italy.] Pp. 346. 8vo. *Milan.*

Oriol, R. Varios itinerarios geologico-mineros por la parte norte de la provincia de Palencia. [Geological and Mining Information on the N. Part of the Province of Palencia.] *Bol. Com. map. geol. Españ.* t. iii. pp. 257–276.

Ortlieb, J. Les Alluvions du Rhin et les sédiments du système diestien dans le Nord de la France et en Belgique. [Alluvia of the Rhine and Diestian of N. France and Belgium.] *Ann. Soc. Géol. Nord*, t. iii. p. 94.

Part 1 describes the river-deposits of the Rheinau (the plain between Heidelberg and the Rhine). These consist of three zones—modern alluvium, old alluvium (uncultivated wooded waste), and older alluvium (very stony but cultivated).

Part 2.—Thinks that the Diestian was deposited in Pliocene times by a river taking its source S. of and running parallel with the Thames from W. to E., crossing the Channel a little S. of Dover and Calais, and emptying itself into the Pliocene sea between Brussels and Antwerp. The rocks cut through by such a river would account for the lithological characters of the Diestian beds. G. A. L.

Otz, —. Bloc erratique sur le Mont d'Amin. [Boulder on Mt. d'Amin.] *Bull. Soc. Sci. Nat. Neuchâtel*, t. x. no. 3, p. 357.

Paquot, R., and — **Bilharz.** Excursion du 24 Juin aux Mines et Usines de Bleyberg et de Moresnets. [Excursion to the Bleyberg and Moresnets Mines.] *Ann. Assoc. Ing. Liége*, sér. 2, t. vi. pp. 153–164.

M. Paquot describes the position of the Bleyberg vein, in Carboniferous Limestone and Coal Measures; the vein contains sulphides of zinc, lead, and iron. M. Bilharz describes the geological position of the Calamine deposit of Moresnets, which lies in a cup-shaped hollow in L. Carboniferous Limestone (dolomite), surrounded by Devonian schists. The deposits of Altenberg and Kelmisberg are likewise noticed. A. R.

Paul, K. M. Grundzüge der Geologie der Bukowina. [Geology of the Bukowina.] *Jahrb. k.-k. geol. Reichs.* Bd. xxvi. Heft 3, pp. 261–330, tab. 17 (geol. map), and 21 woodcuts.

Crystalline schists with a general S.E. strike occupy the S. Bukowina; their lower division consists of quartzites and chlorite-schists, the upper of garnetiferous mica-schists, gneiss, &c.; these are followed by limestone, not connected with them, but separated by a conglomerate which is probably Verrucano (Dyas); the dolomitic limestones are classed as L. Trias; above them come jaspery shales, which are succeeded by U. Trias limestones containing Wengen fossils. Next follow the Carpathian sandstones, which have been shown to consist in the W. and middle of the range of Neocomian or other Cretaceous beds chiefly, as far as horizons can be drawn. It is here divided into L. Carpathian sandstone with:—1. Calcareous sandstones with *Belemnites*, = Neocomian; 2. Munczel conglomerate and limestone with *Rhynchonella lata*,

also Neocomian ; 3. Ropianka beds with fucoids, petroleum-bearing, also Neocomian. Middle Carpathian sandstone, probably of Gault age ; and U. Sandstone, Schipot sandstone and shale, probably Eocene, followed by Nummulitic sandstones. The Neogene deposits occupy half of the country ; at the base are the salt-beds of Galicia, representing the L. Mediterranean stage ; they are worked at Kaczika, but occupy little of the surface, the U. Mediterranean and Sarmatian beds covering all the rest. Many sketch-sections illustrate structural details. E. B. T.

Paul, K. M. Vorlage der geologischen Uebersichtskarte der Bukowina. [Account of the Geological Index-map of the Bukowina (scale of 1 : 288000).] *Verh. k.-k. geol. Reichs.* p. 183.

Pellat, Edm. Découverte de Fossiles d'eau douce dans les minerais de fer Wealdiens du Bas-Boulonnais. [Freshwater fossils in the Wealden Iron-ores of the Bas-Boulonnais.] *Bull. Soc. Géol. France*, 3 sér. t. iii. pp. 642, 643.

Note of occurrence of a *Unio*, besides brackish-water *Cyrenæ*, &c.

——. Émersion du Sud et de l'Est du bassin parisien à la fin de la période jurassique, et extension de la limite inférieure de l'étage portlandien du Boulonnais. [Rise of the S. and E. parts of the Paris Basin at the close of Jurassic Times, and Extension of the lower limit of the Portlandian in the Boulonnais.] *Bull. Soc. Géol. France*, 3 sér. t. iv. pp. 364–369.

The Portlandian of French geologists does not coincide with what is understood by that term in England. At Boulogne, below the English Portlandian (Portland stone and sand) there is a great limestone-and-clay series (still Portlandian), which corresponds to part of the Kimmeridge Clay. This series includes, in descending order, the Ningle grit, the sands of Terlincthun, the Châtillon conglomerate, the Mt. Lambert grit, the Châtillon shales, and the grit of Moulin-Hubert. At Rouen and Hâvre the Kimmeridge Clay seems to extend below the *Astarte* limestone. G. A. L.

——. Sur la présence de Fossiles dans le Keuper des environs de Couches-les-Mines (Saône-et-Loire). [Fossils in the Keuper near Couches-les-Mines.] *Bull. Soc. Géol. France*, 3 sér. t. iv. pp. 369, 370.

The fossils of which the discovery is recorded are *Naticæ*, *Myophoriæ*, and one *Avicula*, probably the *A. exilis* of the *Acephala* bed near Esino. The specimens occur in a pinkish dolomite. G. A. L.

Pena, A. Resena geologica de la provincia de Toledo. [Geology of the Province of Toledo.] *Boll. Com. map. geol. Españ.* t. iii. pp. 329–332.

Peters, K. F. Fels oder Nicht-Fels ? Eine Frage aus der Praxis. [Rock or Not ?] *Verh. k.-k. geol. Reichs.* pp. 93–95.

A question with reference to a railway-tunnel through the watershed between the Mur and the Raab, as to what is properly to be called

"stone-work" and what "earth-work" in tunnelling. The geological data are given. G. A. L.

Peters, K. F. Die Donau und ihr Gebiet. [The Danube and the Danube Country.] Bd. ix. of the *Internationale wissenschaftliche Bibliotek*. Pp. 375. *Leipzig*.
Gives a geological sketch of the region.

Pettersen, Karl. Serpentin- og Olivinstens-forekomsten i det nordlige Norge. [Occurrence of Serpentine and Olivine-rock in N. Norway.] *Geol. Fören. Stockholm Förhandl.* Bd. iii. pp. 62–71, plate. See also *N. Jahrb.* p. 613.
The occurrence and position of the two rocks are described, and the probability of the serpentine being a secondary product derived from olivine-rock, which latter is proved to be itself metamorphic in several localities, is discussed. E. E.

——. Olivinstensforekomsten i det nordlige Norge. [Occurrence of Olivine-rock in Norway.] *Geol. Fören. Stockholm Förh.* Bd. iii. pp. 198–205, plate (plan and sections).
Gives an account of the locality and mode of occurrence. Describes the mineralogical composition of the rock and its associated minerals.

——. Saltens Geologie. [Geology of Salten.] *Arch. Math. Naturvid.* Bd. i. pp. 211–228, plate of sections. (Pp. 221–238 reprinted with considerable alterations at end of vol., to be substituted for those pages as first issued.)
The rocks of the region of the Saltenfjord in N. Norway are:—Laurentian gneiss (*grundfjeldets gneis*); the Tromsoe mica-schists (Huronian); the Balsfjord slate series, comprising limestone and schistose quartzites (Taconic); and the Kjölen granite (gneiss-granite and granite proper). G. A. L.

——. Bidrag til det nordlige Norges Orografi. [Orography of N. Norway.] *Arch. Math. Naturvid.* Bd. i. pp. 367–437, contoured map and plate of sections.
The sections are the same as some of those in the foregoing paper. The geology of the country is described.

——. Rischulen ved Lavangsbotten. [Caves near Lavangsbotten.] *Arch. Math. Naturvid.* Bd. i. pp. 456–460 (by a printer's error the paging is given as 556–560), plate.
Gives a description, with plan and sections, of this branching cavern, 460 feet long, 6 to 12 broad, and 5 to 6 high.

Pfaff, Prof. F. Mt. Blanc-Studien. Ein Beitrag zur mechanischen Geologie der Alpen. [Geology of Mt. Blanc, &c.] *Zeitsch. deutsch. geol. Ges.* Bd. xxviii. pp. 1–21; 8 woodcuts.
Doubting the mechanical explanation of the fan-structure, observations on the inclination of the Secondary limestones and shales were

made at several points of the chain; and the author holds that they more frequently dip away from the axis. Moreover the occurrence of a conglomerate with rolled pebbles of crystalline rocks shows that these were elevated before the formation of the Secondary beds. The idea of a general fan-structure is rejected; the crystalline schists are supposed to have been vertical before the Trias and Jurassic beds were laid horizontally upon them, the normal position being seen in the peak of the Aiguilles Rouges. To account for the cases of apparent inclination of Secondary beds under the crystalline rocks and towards the interior of the range, it is supposed that these are local occurrences produced by sinking of original horizontal beds consequent on removal by solution of underlying gypsum and calcareous beds; the edges would be upturned and the crystalline schists might seem to overhang. E. B. T.

Pichler, A. Beiträge zur Geognosie und Mineralogie Tirols. [Geology of Tyrol.] *N. Jahrb.* Heft ix. pp. 919–923.

Local stratigraphical and petrographical details of the Achenthal and the Pens "massif."

Piette, Ed. La hauteur du glacier quaternaire de la Pique, à Bagnères-de-Luchon. [Height of the La Pique Quaternary Glacier at Bagnères-de-Luchon.] *Compt. Rend.* t. lxxxiii. p. 1187.

Pilar, Dr. G. Spuren der Eiszeit im Agramer Gebirge. [Traces of the Ice-age in the Agram mountains.] *Verh. k.-k. geol. Reichs.* pp. 233–235.

Notes the direct and the indirect evidences of glaciation met with in these hills, which are little more than 3000 feet above the sea-level.

Pillet, L. Note sur la constitution géologique de la colline de Lemenc. [Geology of the Lemenc Hill (Savoy).] *Bull. Soc. Géol. France*, 3 sér. t. iii. pp. 687–690.

Lists of fossils from the *Ammonites tenuilobatus* zone and 2 higher horizons of the U. Jurassic.

Platz, Prof. —. Ueber die Bildung des Schwarzwaldes und des Vogesen. [The Black Forest and the Vosges.] *Zeitsch. deutsch. geol. Ges.* Bd. xxviii. Heft 1, pp. 111–132, tab. 3.

Controverts the views of Lepsius that the Trias and Jurassic have extended over the Vosges, &c. area, and argues that the older view is correct, that the Black Forest and Vosges were never covered by such beds, and that they existed as continental land before the deposition of the Muschelkalk. The origin of the Rhine valley dates accordingly from before the deposition of the Muschelkalk. E. B. T.

——. Ueber die Bildungsgeschichte der oberrheinischen Gebirge. [Formation of the Hills of the Upper Rhine.] *N. Jahrb.* Heft vii. p. 754. (See above.)

Ponzi, Prof. G. In riposta alle considerazioni critiche fatte dal

signor dott. Angelo Manzoni sulla Fauna Vaticana. [Answer to Criticisms of Dr. Manzoni.] *Boll. R. Com. geol. Ital.* t. vii. pp. 39, 40.

The author had classed his Vatican Fauna as Tortonian or top of the Miocene, but has no objection to its being called L. Pliocene [see GEOLOGICAL RECORD for 1875, p. 81]. Repeats that *Nassa semistriata* occurs in the Miocene of the Roman district. E. B. T.

Ponzi, Prof. G. Il Tevere ed il suo delta. [The Tiber and its Delta.] *Rivista Marittima*, anno ix. pp. 40; 3 pls.

A history of the formation of the delta, with a geological description of the district.

Pošepný, F. Ueber die geologischen Aufschlüsse an der Saline zu Bex in der Schweiz. [Geology of the Salt-deposits of Bex, Switzerland.] *Verh. k.-k. geol. Reichs.* pp. 102–105. French Translation by **M. de Tribolet**, in *Arch. Sci. Phys. Nat.* t. lvii. pp. 77–84.

Gives an account of the conclusions of former observers. The salt-bearing rock is Liassic; and the salt occurs associated with gypsum.

Prendel, —. [Geological Sketch of the Chalk in the Crimea and the Passage-beds between the Chalk and the Eocene.] *Zapiski Novoruss. Obw. Estest.* t. iv.

Prokesch, A. Die alten Nussdorfer Wasserbauwerke. [The old Nussdorf Waterworks.] *Blätt. Ver. Landesk. Niederösterr.* Bd x. nos. 1, 2, 3, p. 80.

Contains geological matter.

Rambotti, Vinc. Osservazioni geognostiche sui dintorni di Catanzaro. [Geological Observations in the Neighbourhood of Catanzaro.] *Boll. R. Com. geol. Ital.* t. vii. pp. 388–402.

The rocks noticed in this extreme part of Calabria are various divisions of the Tertiaries (the Secondary rocks are absent), crystalline schists [Palæozoic?], and various kinds of granites, which occur in masses, veins, and dykes. E. B. T.

Raulin, Prof. V. Carte géologique du département de la Gironde. [Description of a Geological Map of Gironde (scale of 1 : 160,000).] *Bull. Soc. Géogr. comm. Bordeaux*, t. i. p. 223.

Renevier, Prof. E. Sur les terrains de la Perte du Rhône. [Rocks of the Perte du Rhône.] *Bull. Soc. Géol. France*, 3 sér. t. iii. pp. 704–706, plate.

A detailed section of the beds in 25 subdivisions, belonging to the Molasse, Gault, Aptian, Rhodanian, and Urgonian formations, with a vertical and a longitudinal section, the latter to a true scale. G. A. L.

——. Relations du Pliocène et du Glaciaire aux environs de Côme. [Relations of the Pliocene and Glacial Deposits in the Neighbourhood of Como.] *Bull. Soc. Géol. France*, 3 sér. t. iv. pp. 187–199

Describes the beds at Fino, Pontegana, and Balerna. The author's views are illustrated by a Table. The glacial mud at Balerna, Como, &c. is shown to be intermediate in age between a thin gravelly Astian zone at Balerna and Pleistocene stratified gravels at the same place and at Pontegana. G. A. L.

Reusch, Hans H. Træk af Havets Virkninger paa Norges Vestkyst. [Features of Marine Action on the W. Coast of Norway.] *Nyt Mag. Nat.* Bd. xxii. pp. 169–244.

Details of caves, potholes, and other effects of marine erosion on the islands between the promontory of Stadt and the Romsdal Fjord. The highest-lying cave described has its entrance 215 feet above the sea, and almost perforates the island of Sandö. The shore potholes differ from the well-known giants' kettles in being more or less broken down on the seaward side. To many details are added preliminary notes on coast-terraces and coast-mounds. The former are steps left in its own deposits by the retreating sea, thus differing from the dale-terraces; the latter are spits formed by currents, and occasionally continuous with those still under water. H. M.

Revon, L. Les gorges de la Diosaz. [The Diosaz Gorges.] *Ann. Club Alp. Franç.* 2 ann. p. 42.

Partly geological.

Reymond, F. La Vanoise. [The Vanoise.] *Ann. Club Alp. Franç.* 2 ann. p. 153.

Contains geological matter.

Robert, E. Observations relatives aux plissements et aux brisures du terrain crétacé, à propos du projet de percement d'un tunnel sous la Manche. [Folds and Fractures of the Cretaceous Rocks, with reference to the Channel Tunnel.] *Compt. Rend.* t. lxxxii. p. 345.

——. Sur les traces de dislocation que présente le terrain tertiaire dans la vallée de l'Oise. [Traces of Dislocation exhibited by the Tertiaries of the Oise Valley.] *Compt. Rend.* t. lxxxii. p. 390.

——. Sur les gisements d'ossements fossiles de Pargny-Filain et de Sézanne. [Bone-beds of Pargny-Filain and Sézanne.] *Compt. Rend.* t. lxxxiii. p. 1250.

——. Sézanne au point de vue géologique. [Geology of Sézanne, Marne.] Pp 20. *Sézanne.*

Geological sketch of the country round the town.

Robert, Félix. Volcans de la Haute-Loire. [Volcanoes of Haute-Loire.] *Bull. Soc. Géol. France,* 3 sér. t. iv. pp. 355–360.

Continued from t. ii. p. 245 (see Geological Record for 1874, p. 92). The volcanoes of the third age are basaltic; they are found in the basins

of Yssengaux, Le Puy, and Emblavès. Those of the fourth era, consisting of volcanic breccias, are those of Cheyrac, Rocher de Polignac, Sainte-Anne, Eyssenac, Saint-Michel, and Corneille. G. A. L.

Roemer, Prof. Ferd. Ueber das Vorkommen von Culmschichten mit *Posidonomya Becheri* in Portugal. [Occurrence of Culm-beds with *P. Becheri* in Portugal.] *Zeitsch. deutsch. geol. Ges.* Bd. xxviii. pp. 354–360.

Sen. Delgado has proved that Prof. Roemer's surmise that the *Posidonomya* beds extended from the S. flank of the Sierra Morena across the Guadiana into Portugal was correct. These Carboniferous rocks stretch across S. Portugal from Mertola to Cape St. Vincent, the resemblance between them and the German Culm being remarkable. G. A. L.

Rogers, J. J. Note on a collection of Palæolithic Remains from the valley of the River Vézère. *Journ. R. Inst. Cornwall*, no. xviii. pp. 278–280.

Describes some flints and animal remains from the Dordogne caves.

Roth, Samuel. Die eruptiven Gesteine des Fazekasboda-Morágyer Gebirgszuges (Baranyaer Comitat). [Eruptive Rocks, &c.] *Mitth. Jahrb. k. ung. geol. Anst.* Bd. iv. Heft 2, pp. 95–123 ; 7 cuts. In Magyar, *Mag. k. fold. int. Evkon.* köt. iv. füz. 3, p. 103.

The rocks noticed are—orthoclase-oligoclase-granite, which in places is syenitic ; orthoclase-granite, as dykes piercing the former ; gneiss-granite and veins of so-called diabase-diorite. E. B. T.

——. Ueber die Faröer und das Vorkommen von Kohlenflötzen daselbst. [Faroe Isles and their Coal-beds.] 8vo. *Bonn.*

Rothpletz, A. Ueber devonische Porphyroïde in Sachsen. [Devonian Porphyroids in Saxony.] *Sitz. nat. Ges. Leipzig*, Jahrg. 3, pp. 63–71.

Describes the 2 horizons of igneous rock in the Wyhra, Mulde, and Langenau valleys.

Rouville, Prof. P. de. Introduction à la Description Géologique du Département de l'Hérault. [Geology of Hérault.] Ed. 2. Pp. 222; 10 plates. *Montpellier.*

For notice of Ed. 1 see Geological Record for 1875, p. 95.

Roys, Marquis de. Note sur les terrains des environs de Beaucaire. [Geology of Beaucaire.] *Bull. Soc. Géol. France*, 3 sér. t. iv. pp. 170–178.

Consists of local details.

Rubio, A. Resena fisico-geologica del valle de Laceana, provincia de Léon. [Geology and Physical Features of the Laceana Valley, Province of Leon.] *Bol. Com. map. geol. Espan.* t. iii. pp. 333–346.

Rütimeyer, Prof. L. Ueber Pliocen und Eisperiode auf beiden Seiten

der Alpen. Ein Beitrag zu der geschichte der Thierwelt in Italien seit der Tertiärzeit. [Pliocene and Ice-period on both sides of the Alps. A Contribution to the History of the Italian Fauna since Tertiary times.] Pp. 78, map. 4to. *Basle.*

Rutot, A. Note sur la présence de la barytine dans le schiste rouge de l'étage du poudingue de Burnot. [Barytine in the Red Shale of the Burnot Conglomerate Horizon.] *Ann. Soc. Géol. Belg.* t. iii. *Bull.* p. liii.

Note of occurrence.

Rutot, A., and — **Vincent.** [Description of the Brussels Eocene.] *Proc.-verb. Soc. Belg. Micr.* no. ix. pp. 9–13 (Abstract).

The U. Ypresian (4 zones), Paniselian, Bruxellian (2 zones), and Laekenian (3 zones) are referred to, with special reference to Vanden Broeck's discovery of the alteration of Laekenian beds. W. H. D.

Saigne, Lucien de la. Le Portugal historique, commercial et industriel. [Portugal.] *Paris.*

States facts regarding the natural resources of the country.

Sandberger, F. [Boring in Switzerland.] *N. Jahrb.* Heft i. pp. 43, 44.

A boring for coal in the Canton Aargau reached a depth of 1422 feet in Oct. 1875; but having been for some depth in hornblende-rocks, hope of reaching coal was abandoned. F. W. R.

Saporta, Count G. de, Dr. A. F. Marion, and **A. Falsan.** Recherches sur les végétaux fossiles de Meximieux, précédées d'une introduction stratigraphique. [The Fossil Plants of Meximieux, with a Stratigraphical Introduction.] *Basle.*

Reprinted from the memoir noticed in the Geological Record for 1875, pp. 62 (under **Falsan**), 339.

Schlüter, Clemens. Verbreitung der Cephalopoden in der oberen Kreide Norddeutschlands. [Distribution of Cephalopoda in U. Chalk of N. Germany.] *Zeitsch. deutsch. geol. Ges.* Bd. xxviii. Heft 3, pp. 457–517. Noticed in *Geol. Mag.* 1877, p. 169.

Out of 155 Cephalopoda, 40 are peculiar to the Cenomanian, 29 to the Turonian, 21 to the Ems beds. Lists of characteristic Cephalopoda and of the other fossils in each zone are given, while the precise range of each species of Cephalopoda is shown by a table. The following are the zones adopted for the N. German U. Cretaceous in ascending order:— A. Lower Pläner (Cenomanian), zones of (1) *Pecten asper* and *Catopygus carinatus*, (2) *Amm. varians* and *Hemiaster Griepenkerli*, (3) *Amm. Rhotomagensis* and *Holaster subglobosus*. B. Upper Pläner (Turonian), zones of (4) *Actinocamax plenus*, (5) *Inoceramus mytiloides* and *Amm. nodosoides* = Mytiloides-Pläner, (6) *Inoceramus Brongniarti* and *Amm. Woollgari* = Brongniarti-Pläner, (7) *Heteroceras Reussianum* and *Spon-*

dylus spinosus=Scaphites-Pläner, (8) *In. Cuvieri* and *Epiaster brevis* =Cuvieri-Pläner. C. Ems marls, 500–1500 feet, zone of (9) *Amm. Margæ* and *In. digitatus*. D. Lower Senonian (Santonian), zones of (10) marls with *Marsupites ornatus*, (11) quartzose beds with *Pecten muricatus*, (12) calcareo-siliceous beds with *Scaphites binodosus*. E. Upper Senonian (Cœloptychius-chalk), zones of (13) *Becksia Soekelandi*, (14) *Amm. Coesfeldiensis* and *Micraster glyphus* = Lower Mucronata beds, (15) *Heteroceras polyplocum*, *Amm. Wittekindi*, and *Scaphites pulcherrimus* = Upper Mucronata Chalk. E. B. T.

Schmid, Dr. E. E. Der Ehrenberg bei Ilmenau, geologisch und lithologisch beschrieben. [Geology of the Ehrenberg (hill).] Pp. 69; 3 tab. 8vo. *Jena.*

The order of igneous rocks from their respective intrusions is Labrador-diorite, granite, quartz-porphyry, the latter being Permian. Contact-alterations of granite breaking through diorite are described, microscopic sections, analyses of rocks and minerals given. E. B. T.

Schrader, Fr. Nouvelles explorations dans le massif calcaire des Pyrénées. [New Researches on the Pyrenean Limestone-mass.] *Ann. Club Alp. Franç.* 2 ann. p. 395.

Refers to the geology of the district.

Scrive, —. Communication sur le Gisement du Cuivre Argentifère des Mines de la Prugne et Charier dans le Département de l'Allier. [Argentiferous Copper in Allier.] *Mém. Soc. Sci. Agr. Arts Lille*, sér. 4, t. ii.

Seebach, von. [Geology of the Tambach District.] *Zeitsch. deutsch. geol. Ges.* Bd. xxviii. Heft 3.

The Rothliegende contains a conglomerate full of porphyry fragments. Connected with the eruptive rocks are felsitic pumice and felsite glass, showing a volcanic origin for the porphyry. E. B. T.

Seeland, F. Der Hüttenberger Erzberg und seine nächste Umgebung. [Hüttenberg Iron-ores, &c.] *Jahrb. k.-k. geol. Reichs.* Bd. xxvi. Heft 1, pp. 49–112, tab. i.–iv. (geol. col. map (scale 1 : 8640), sections, &c.).

The iron-works of Hüttenberg, Carinthia, draw their ores (siderite and limonite) from a tract of crystalline primitive limestone enclosed in the gneiss and mica-schist. The Saualp and Hüttenberg-Lölling district contain also the following massive rocks—pegmatite, eclogite (saualpite), amphibolite, serpentine, diorite, &c. The iron-ore deposits occur on the Erzberg (1372 m.) and Rudolfshöhe (1269 m.), and form 6 bands with a combined greatest thickness of 2200 metres; these are described in detail and illustrated by plans. The petrography of the crystalline rocks is noticed; a description of minerals of the district, with some notice of Muschelkalk and Eocene limestones, &c., are added.

Analyses of the ores and also of the various brands of iron made are given in tabular form. E. B. T.

Seghers, F. [Note of Occurrence of Rolled Fossils in Belgian Drift.] *Ann. Soc. Mal. Belg.* t. x. *Bull.* pp. xli, xlii.

Seguenza, G. Risposta alla Nota del Signor T. Fuchs. *Boll. R. Com. geol. Ital.* t. vii. pp. 237, 238.
Answer and end of the matter. [See **Fuchs**, p. 66.]

——. Di certe rocce vulcaniche interstratificate fra rocce de sedimento. [Interbedded Volcanic Rocks (in U. Pliocene of Messina).] *Rend. Ac. Sci. Napoli,* ann. xv. fasc. vi. pp. 10–12, plate.

Sévoz, Victor. Mémoire sur les gisements pyrito-cuivreux de Castifao et Moltifao (Corse). [Copper-pyrites Deposits of Castifao and Moltifao, Corsica.] *Bull. Soc. Sci. Indust. Marseille*, t. iv. pp. 148–162; 3 plates.
The localities are in the S. part of the Serra de Tenda; and the copper-ores occur in connexion with a series of green serpentinous and euritic rocks, having a general N. and S. trend. The ores are:—more or less cupriferous iron-pyrites, compact, in strings, nodular, in small agglomerated crystals, or disseminated in the gangue; yellow copper-pyrites and Phillipsite, in veins or in small lenticular masses; green and blue carbonate of copper (azurite and malachite) impregnating the rocks near the surface. All these are distributed along the W. side of the long band of green rocks. Many details of working, &c. are given, with sections, plans, and a geological map of Corsica. G. A. L.

Sexe, S. A. Et Spörgsmaal angaaende Sveriges Rullestensaaser. [A Question as to the Swedish "Åsar."] *Geol. Fören. Stockholm Förh.* Bd. iii. pp. 164–166.
Calls attention to the question whether or not some of the Swedish "åsar" are former middle-moraines resting on remains of bottom-moraines. E. E.

——. Om nogle gamle Strandlinier. [Some old Coast-lines.] *Arch. Math. Nat.* Bd. i. pp. 1–18.

Sjögren, A. Om förekomsten af Tabergs jernmalmsfyndighet i Småland. [Occurrence of the Taberg Iron-ore deposit in Småland, Sweden.] *Geol. Fören. Stockholm Förh.* Bd. iii. pp. 42–62.
An historical sketch of the hill is given; its surrounding rocks, its form and extension, &c. are described; and the constitution of the ore is noticed. The hill is 420 Swedish feet high, 3000 long, and 1500 broad. It consists of an almost homogeneous eruptive rock, composed of olivine and magnetite, with grains of plagioclase, viridite, and serpentine. The percentage of iron varies between 32 and 21. E. E.

——. Om Hållsjöberget (Horrsjöberget), ett bidrag till Vermland geognosi. [The Horrsjö Mountain in Wermland, Sweden.] *Geol.*

Fören. Stockholm Förh. Bd. iii. pp. 219–226, plate (plan and section to the scale of 1 : 200,000).

Gives a sketch of the situation and the geology of the mountain, calls attention to its minerals, describes its rocks (quartzite, hyperite, and a porphyritic rock). E. E.

Soler, D. M. Las Minas de Oro de la Nava de Jadraque, en la provincia de Guadalajara. [The Gold Mines of la Nava de Jadraque, in Guadalajara.] *Rev. Min.* t. ii. pp. 245.

Stache, Dr. Guido. Geologische Notizen über die Insel Pelagosa. [Geology of the Island of Pelagosa.] *Verh. k.-k. geol. Reichs.* pp. 123–127.

Refers particularly to the statements of M. Stossich. Regards Pelagosa as a part of the sunken sea-coast of the Adriatic Neogene mainland which joined Dalmatia to Apulia. G. A. L.

——. Geologische Karte des oberen Vintschgau. [Note on the Geological Map of U. Vintschgau.] *Verh. k.-k. geol. Reichs.* p. 176.

——. Aus dem Ortler Gebiet. [The Ortler District.] *Verh. k.-k. geol. Reichs.* pp. 314–317.

——. Ueber die alten andesitischen Eruptivgesteine des Ortlergebietes. [Ancient Andesite eruptive Rocks of the Ortler District.] *Verh. k.-k. geol. Reichs.* pp. 346–348.

Stefani, C. de. Geologia del Monte Pisano. *Mem. R. Com. geol. Ital.* t. iii. part 1, pp. 47–169, plate (sections) and 4 woodcuts.

[See also Geological Record for 1874, p. 99, and for 1875, p. 99.]

A detailed description of Mte. Pisano, S. of Lucca, and of the Pisa district. The older schists often cited as Palæozoic are here referred to the Trias; above these come grey limestones and shales (Infra-Lias). Chapter 3 deals with the "calcaire céroide" (L. Lias) and the red limestone (upper part of L. Lias); among the fossils cited from L. Lias the following are new:—*Rissoina obliquecostata*, *Chemnitzia pseudotumida*, *C. phasianelloides*, *C. clava*, *C. Saviana*, *Neritopsis Meneghiniana*, *N. Passerinii* (Men.), *Straparollus ornatus* (Men.), *Stomatia Meneghini* (Men.), *Pleurotomaria Pisana*, *P. canaliculata*, *Mytilus disputabilis*. Limestone with chert is referred to the M. Lias; variegated shales, with *Posidonomya Bronnii* as sole fossil, represent the U. Lias. Chap. 4 treats of Tithonian and Neocomian beds. 5 of the "argille scagliose" (M. Cretaceous). 6. "Alberese" (U. Cretaceous). 7. "Macigno" (M. Eocene). 8. Pliocene. 9. Postpliocene. 10. Mentions the gain of land, removing the coast-line from Pisa for a distance of several thousand metres, since the time of the Romans; the distribution of different river-sediments is tracked along the coast. A disquisition on the orography and elevation of the "metalliferous chain" and of the Apennines (pp. 132–167) ends the memoir. E. B. T.

Stefani, C. de. Le rocce serpentinose della Garfagnana. [Serpentine of Garfagnana District.] *Boll. R. Com. geol. Ital.* t. vii. pp. 16–31 ; 3 woodcuts.

Shows that the serpentine of the Apuan Alps is not Prepalæozoic or Laurentian. While in Elba, Corsica, &c. the serpentine rocks are older than the Infra-lias, but not older than the Carboniferous, here they are either Cretaceous or more frequently Eocene. The serpentine of the basin between the Apuan Alps and the Apennines is accompanied with gabbro and diabase, but mingled with them are sedimentary rocks. In the Garfagnana they are U. Eocene, being associated with the *alberese*, and lie above the *macigno* [M. Eocene], never being found intrusive in it. Similar rocks of the Lunigiana and maritime Liguria are probably of the same age. The serpentine was probably poured out over the bottom of the U. Eocene sea. E. B. T.

——. Sedimenti sottomarini dell' epoca postpliocenica in Italia. [Marine Post-pliocene Sediments, &c.] *Boll. R. Com. geol. Ital.* t. vii. pp. 272–289.

Although Post-pliocene land-deposits are known in Italy, no contemporaneous marine beds have been commonly recognized. From a criticism of the molluscan fauna from various localities the author establishes a proof of cold climate in the sea, and therefore of the glacial age of such. For example, beds at the new docks, Leghorn, yielded 133 species, of which only 4 are extinct [= 3 per cent.] ; in other cases the proportion was about 11 p. c. [whereas in Pliocene beds it varies from 25 to 50 p. c.] ; the presence of *Cyprina Islandica* in all these cases is also confirmatory of a cold and Post-pliocene climate. Instances specially analyzed are deposits at Monte Pellegrino and Ficarazzi, near Palermo, Sciacca and Carrubbare, near Reggio, Calabria ; even those of Vallebiaia and the upper beds of Monte Mario with *C. Islandica* are considered Glacial [usually called U. Pliocene). E. B. T.

Stoehr, E. [Section at Girgenti, &c.] *Zeitsch. deutsch. geol. Ges.* Bd. xxviii. Heft 3, pp. 650–654.

Notice of a section near Girgenti which shows a continuous conformable series from the latest Tertiaries down to the Sulphur-formation ; the divisions are grouped as U. and M. Astian, Messinian, and underlying cavernous limestone. E. B. T.

——. Il terreno pliocenico dei dintorni di Girgenti. [Pliocene of Girgenti.] *Boll. R. Com. geol. Ital.* t. vii. pp. 451–474, plate (sections).

Classifies the divisions of the Pliocene in this district under Upper (Astigian), consisting of 4 subdivisions, and Lower (Messinian). The conditions under which they were deposited are deduced from the fossils found. The fauna is separately catalogued [8 pp.], and compared with that of other Italian fossil localities, as well as with the Recent period. In the U. Pliocene 197 species are noted ; out of 131 Mollusca, only 27 are extinct. The second table is a list of 60 Foraminifera. E. B. T.

Stoppani, A. Sui rapporti del terreno glaciale col pliocenico nei dintorni di Como. [Relation of Glacial to Pliocene about Como.] *Atti Soc. Ital. Sci. Nat.* vol. xviii. pp. 172–196.

——. Il bel paese; conversazioni sulle bellezze naturali, la geologia e la geografia fisica d'Italia. [Geology of Italy.] Pp. 488, plate. 8vo. *Milan.*

Struckmann, C. Notiz über das Vorkommen des Serpulits der oberen Purbeckschichten im Vorort Linden bei Hannover. [Serpula-bed of U. Purbecks at Linden, &c.] *Zeitsch. deutsch. geol. Ges.* Bd. xxviii. Heft 3, pp. 445–447.

The higher beds hitherto known here were the "Plattenkalke" (U. Portland). Notes section of excavation for house where Purbeck marls are seen, *Serpula coacervata* occurring through 7 feet of them. E. B. T.

Struve, —. Untersuchung einer neuentdeckten Steinkohle bei Gelask in Imeretien. [New Discoveries of Coal near Gelask, in Imeretia.] *Bull. Ac. Imp. St. Pétersb.* t. xxi. p. 71.

Stur, D. Der Trilobiten-Fund des Herrn Kasch in den Kalkmuggeln des Heiligenberger Schacht bei Přibram. [Trilobites in the Heiligenberg Shaft at Přibram.] *Verh. k.-k. geol. Reichs.* pp. 31, 32.

The trilobite, found in light reddish-grey limestone, is *Phacops fecundus*, and probably belongs to the variety *major*. The rock belongs to a very young stage of the Silurian of Central Bohemia. The question is, how the stone got into the vein, which is in the first Greywacké zone. G. A. L.

——. Vorlage der Uebersichtskarte des Ostrau-Karwiner Steinkohlenreviers. [Account of the Map of the Ostrau-Karwin Coalfield.] *Verh. k.-k. geol. Reichs.* pp. 144–150.

The map, in 8 sheets, scale 1 : 14400, was drawn by **H. Jahns.**

Symonds, Rev. W. S. The Fossil Skeletons of Le Puy en Velay. *Nature*, vol. xiii. p. 207.

Directs attention to the stratified breccias on the hill of Denise.

——. Evidences of Ancient Glaciers in Central France. *Nature*, vol. xiii. pp. 425, 426.

Mentions glacial traces in the entrance to the Gorge d'Enfer.

——. Ancient Glaciers in Auvergne. *Nature*, vol. xiv. p. 179.

Believes that a glacier descended the valley of the Dordogne.

Taramelli, T. Cenni geologici sul territorio di Capo d'Istria. [Geology of Capo d'Istria.] Pp. 12, map. 8vo. *Udine.*

Tardy, A. Le plateau de la Dombe (Ain). [The Dombe Plateau, in the Ain.] *Bull. Soc. Géol. France*, 3 sér. t. iii. pp. 582, 583.

Notes the various courses followed by the River Ain in Post-Tertiary times. At first this river followed the valley of the Reyssouze; its

present valley, formed after two glacial phases, separates the Bugey country from the Dombe plateau. G. A. L.

Tardy, A. Localités fossilifères des Glaciers tertiaires. [Fossiliferous Localities of the Tertiary Glaciers.] *Bull. Soc. Géol. France*, 3 sér. t. iii. pp. 612, 613.

The localities are near Turin in the Pliocene Glacial deposits first described by Prof. Gastaldi in 1861; their exact position is fully given.

——. Des Puits naturels et de leur remplissage dans le Jura. [Natural Pits and what they are filled with in the Jura.] *Bull. Soc. Géol. France*, 3 sér. t. iv. pp. 178–181, figure in text.

Notes that the so-called pits or pipes are more or less lined with clay.

——. Un ancien Glacier des environs de Genève. [Ancient Glacier near Geneva.] *Bull. Soc. Géol. France*, 3 sér. t. iv. pp. 180–183.

Notes that a glacier alone can have carried the Valais rocks, of which fragments are now found in the Drift of the Rhône valley, across the Lake of Geneva. This Drift forms a transition between the Tertiary and Quaternary deposits. G. A. L.

——. Les Glaciers miocènes en Bresse. [Miocene Glaciers of Bresse.] *Bull. Soc. Géol. France*, 3 sér. t. iv. pp. 184–186, figure in text.

Notes a boulder-drift seldom seen on the surface, but met with in well-sinking and in other works, which he considers Miocene, and intercalated between the Molasse deposits and the lignitiferous lacustrine clays of the Bresse. G. A. L.

——. Les Glaciers pliocènes. [Pliocene Glaciers.] *Bull. Soc. Géol. France*, 3 sér. t. iv. pp. 285–289.

Brings forward additional evidence proving the existence of such glaciers in the Bresse. In a table of equivalent deposits the parallel divisions at Dürnten, Geneva, Rivoli, Lyons, Bourg, and Perrier are given. G. A. L.

——. Terrasses de 12 à 17 mètres et de 20 à 29 mètres, leur origine et leur âge. [Origin and Age of Terraces at from 12 to 17 and 20 to 29 metres.] *Bull. Soc. Géol. France*, 3 sér. t. iv. pp. 326–329.

Concludes, from a comparison of the flood-lines of various rivers in France, that the approximate age of terrace-deposits of certain elevations can be arrived at *à priori*. G. A. L.

Taylor, Dr. J. E. Over an Old Land Surface. *Gentleman's Magazine*, n. ser. vol. xvi. pp. 703–709.

Sketch of the recently opened-out phosphatic deposits of Southern France (Montauban, Cailleuse, St. Antonin, Calmette, and Bach).

Tegetmeyer, Aug. Beiträge zur Kenntniss des Keupers im nördlichen Thüringen. [N. Thuringian Keuper.] *Zeitsch. gesammt. Nat.* n. F., Bd. xiii. pp. 405–484, pls. 6, 7 (folding table of beds and fossils).

Describes each division of the series, giving lists of fossils.

Thiélens, Armand. Voyage en Italie et en France.—II. France. [Tour in Italy and France.—II. France.] *Ann. Soc. Mal. Belg.* t. x. *Bull.* pp. lxxxiv–cxxvii.

Gives short accounts of the public and private geological collections at Mâcon and in the environs, at Lyons, and at Paris, with incidental notes on local geology. G. A. L.

Thiessing, Dr. J. Notice sur les richesses minérales de la Suisse. [Mineral Resources of Switzerland.] *Emul. Jurass.* 1 ann. pp. 53–64.

Notes on iron, lead, copper, gold, coal, salt, gypsum, asphalt, clay, building and stones, mineral waters.

Thore, J. [Petroleum in the Pyrenees.] *Bull. Soc. Ramond*, 11 ann. Abstract in *Rev. Géol.* in the *Ann. Mines*, sér. vii. t. x. p. 463. See also *Soc. de Borda*, 1876.

Notes the occurrence of petroleum in the neighbourhood of Dax, Bastennes, Castagnère, Cazère, Saint-Pé-de-Luna, Cassabes, the Padre marshes, Salies-du-Béarn, Barenne, Salles-Mongiscard, Orthez, and Saint-Boés. G. A. L.

Thoreld, A. F. Eger man säker kännedom om tidsförloppet för sjö- och myrmalmers återväxt? och om så är, huru långt är detta tidsförlopp? [Have we any true knowledge as to the Length of Time necessary for the generation of the Lake- and Bog-ores? and, if so, how long is this time?] *Geol. Fören. Stockholm Förh.* Bd. iii. pp. 20–40.

Gives the opinions held as to the origin of lake iron-ore. Instances from Swedish and Finlandic lakes are given showing that the growth of the ore is very slow, and, perhaps, almost imperceptible. The bottom of the lake Tisken, near the Falun copper-mine in Sweden, has been, in a period of 600 years, covered with a layer of loose earthy ochre 10 feet thick, which, during this long period, has not attained either the consistency or any other property of the ordinary lake-ore used for iron-melting. E. E.

Thos, S. Notas acerca de la constitucion geologica de las islas de Ibiza y Formentera. [Geology of the Islands of Ibiza and Formentera.] *Bol. Com. map. geol. Españ.* t. iii. pp. 363–368.

Tombeck, —. Addition à la Note sur les Puits naturels du terrain portlandien de la Haute-Marne. [Natural Pits in the Portlandian of Haute-Marne.] *Bull. Soc. Géol. France*, 3 sér. t. iii. pp. 554, 555.

Believes that at Sossa the pits in question were the mouths whence was ejected the Neocomian iron of the neighbourhood.

——. Note sur le Corallien et l'Argovien de la Haute-Marne. [Corallian and Argovian of Haute-Marne.] *Bull. Soc. Géol. France*, 3 sér. t. iv. pp. 162–170.

Account of further researches, pointing out chiefly facts which, at

first sight, would lead one to imagine a dovetailing between the two series in some localities. G. A. L.

Torcapel, —. Note sur la géologie de la ligne de Lunel au Vigan. [Geology of the Railway from Lunel to Le Vigan.] *Bull. Soc. Géol. France*, 3 sér. t. iv. pp. 15–27, pl. 1 and folding table.

This line runs N.W. from Lunel, along the valley of the Vidourle, as far as the pass of La Cadière, where it crosses the watershed into the Hérault basin to Le Vigan, the distance being 73 kilometres. All the larger groups of beds are enumerated, and a section of the line is given in the plate. The horizons cut through are (in ascending order):—Azoic rocks (Silurian ?), consisting of talcose schists and crystalline limestone; Inf. Oolite, in two divisions; Oxfordian, in three divisions; *Ammonites polyplocus* beds, in two divisions; *Terebratula Moravica* limestones; L. Neocomian, in two divisions; Middle Neocomian, in two divisions; Eocene, one lacustrine deposit only; Middle Miocene (Molasse), in two divisions; Drift and Alluvium. Coal Measure and Triassic rocks are noted near the line. G. A. L.

Torell, O. Sur les traces les plus anciennes de l'existence de l'homme en Suède. [The most ancient Traces of Man's Existence in Sweden.] *Sver. Geol. undersökn.* 16 pp., from the *Compte-rendu du Congrès archéologique de Stockholm.*

Gives a sketch of the Glacial and Postglacial formations, the passage-beds between the Glacial and the Recent period, and the recent (alluvial) deposits, and an account of several archeologico-geological observations, under the following heads:—Stone-implements found in Yoldia-clay, in Halland (W. coast); the finds at the Hästefjord, and at Stångenäs in Bohuslän; the Yäravall (a raised beach on the S. coast of Scania, consisting of sand and gravel resting on peat, &c.); the skeleton of *Bos urus* at the Zoological Museum of the University at Lund; the discovery at the port of Ystad; the cottage at Södertelge (some miles S. of Stockholm). E. E.

Törnquist, L. Berättelse om en geologisk resa genom Skånes och Östergötlands paleozoiska trakter sommaren 1875. [Report of a Geological Journey in the Palæozoic Districts of Skåne and Östergötland, Sweden.] *Œfv. K. Vet. Akad. Förh.* Arg. 32, no. 10.

Gives an account of observations relating to the order of superposition of the different Cambrian and Silurian strata, and deductions as to their relation to similar deposits in other parts of the country, especially Dalecarlia. Some remarkable new facts are noted. E. E.

Toucas, A. Note sur les Terrains crétacés du Sud-Est de la France. [Cretaceous Beds of S.E. France.] *Bull. Soc. Géol. France*, 3 sér. t. iv. pp. 309–318, figure in text.

There are three principal Cretaceous basins in S.E. France, those of Uchaux, Beausset, and Martigues. The classification adopted is as follows (in ascending order):—*Senonian*, 2 divisions and 3 subdivisions. *Turonian*, 3 divisions and 6 subdivisions. *Cenomanian*, 2 divisions

and 5 subdivisions. *Albian*, 1 division (*Belemnites minimus* and *Ammonites auritus* zone). *Neocomian*, 3 divisions and 7 subdivisions. Each number is described separately. G. A. L.

Toula, Dr. Franz. Geologische Untersuchungen im westlichen Theile des Balkan's und in den angrenzenden Gebieten. I. Kurze Uebersicht, &c. [Geological Researches in the W. Balkans, &c.] *Sitz. k. Ak. Wiss. Wien, math.-nat. Cl.* Abth. I. Bd. lxxii. Heft 4, pp. 488–498.

An account of routes, with geological results. Among the crystalline rocks met with were granite, gabbro, diorite-porphyry, &c. Of sedimentary rocks are chiefly mentioned :—Coal Measures, Dyas, Trias, Jurassic (including Tithonian, &c.), Cretaceous sandstones, Miocene, lignites, &c., &c. The district examined was about 180 German square miles. E. B. T.

——. [Geology of the Balkans.] *N. Jahrb.* Heft i. pp. 44, 45. [See the above.]

——. Ein Beitrag zur Kenntniss des Semmeringgebirges. [Geology of the Semmering Mountains.] *Verh. k.-k. geol. Reichs.* p. 334.

——. Eine geologische Reise in den westlichen Balkan und in die benachbarten Gebiete. Pp. 128, map. 8vo. *Vienna.*

Tournouër, —. Note sur quelques fossiles d'eau douce recueillis dans le forage d'un puits au fort de Vancia, près de Lyon. [Fresh-water Fossils from a Well at the Fort of Vancia, near Lyons.] *Bull. Soc. Géol. France*, 3 sér. t. iii. pp. 741–748, part of pl. xxviii.

The list includes the three new forms *Planorbis Giraudus*, *Paludina* (*Vivipara*) *Dresseli*, and *Valvata Vanciana*, which are described and figured. These fossils come from greyish marly beds intercalated in the Glacial or ancient alluvia which spread over the Bressan plateau above the Pliocene sands of Trévoux. G. A. L.

Tribolet, Dr. Maurice de. Sur les terrains jurassiques supérieurs de la Haute-Marne comparés à ceux du Jura suisse et français. [The U. Jurassic of Haute-Marne compared with that of the French and Swiss Jura.] *Bull. Soc. Géol. France*, 3 sér. t. iv. pp. 259–285.

Compares the horizons of the series as exhibited in England, the Boulonnais, Bray, Meuse, Haute-Marne, Yonne, Côte-d'or, Haute-Saône, and Jura. Gives the following classification :—Purbeckian (with Portlandian dolomites), *Cyrena rugosa* zone ; Portlandian, *Ammonites gigas* and *Cyprina Brongniarti* zone ; Virgulian, *Amm. Caletanus* zone ; Pterocerian, *Amm. orthoceras* zone ; Upper Sequanian, *Astarte* limestones and oolite of La Mothe ; Lower Sequanian, compact corallian ; Upper Rauracian, Doulaincourt oolite or grey marls ; Lower Rauracian, rubbly coralline limestones or grey marls ; Pholadomyan, *Belemnites Royeri* zone ; zone of hydraulic limestones, *Amm. Babeanus* zone ; Spongitian, *Amm. Martelli* zone. G. A. L.

Tribolet, Dr. Maurice de. Sur le Gault de Renan. [Gault of Renan.] *Emul. Jurass.* 1 ann. pp. 370–375.

Contains a list of 80 species from the Gault of Renan, with references to their distribution in other localities of the Jura.

——. [*Ammonites tenuilobatus* Zone.] *N. Jahrb.* Heft vii. pp. 735–737.

Discussion as to the value of the zone, based on sections in the Jura, Mâconnais, and Haute-Marne.

Tromelin, Gaston le G. de. Étude de la Faune du grès silurien de May, Jurques, Mont-Robert, etc. (Calvados), avec des observations sur divers fossiles paléozoïques de l'Ouest de la France. [The Silurian Grit Fauna of Calvados, with Notes on several Palæozoic Fossils of W. France.] Pp. 80. *Caen.*

Tromelin, Gaston le G. de, and **Paul Lebesconte.** Essai d'un Catalogue raisonné des Fossiles Siluriens des Départements de Maine-et-Loire, de la Loire-Inférieure et du Morbihan, avec des Observations sur les Terrains Paléozoïques de l'Ouest de la France. [Silurians of W. France.] *Compt. Rend. Assoc. Franç.* 1875, pp. 601–661.

Laurentian, Cambrian, and Silurian rocks occur in the district described. The bulk of the paper is palæontological (see *post*, under Invertebrata). A note on the Tertiary and Quaternary beds is added by **M. de Tromelin.** W. H. D.

Trutat, E. Les glaciers de la Maladetta et le pic des Posets. [Glaciers of the Maladetta and the Posets Peak.] *Ann. Club Alp. Franç.* 2 ann. pp. 440–442.

Contains geological notes.

Vacek, M. Ein neuer Fundort von Gault-Petrefacten in Vorarlberg. [New locality for Gault Fossils in Vorarlberg.] *Verh. k.-k. geol. Reichs.* pp. 127, 128.

Note of occurrence, with list of fossils.

Vallée Poussin, Prof. C. de la. L'excavation de la vallée de la Meuse. [Excavation of the Meuse valley.] *Ann. Soc. Géol. Belg.* t. iii., *Bull.* pp. lv–lix, figure in text.

Invokes the presence of lines of fracture and faults to account for some of the peculiarities of the valley of the Meuse. The discussion shows much difference of opinion (pp. lix–lxi). G. A. L.

Vanden Broeck, Ernest. Sur l'Eocène moyen des environs de Bruxelles. [Middle Eocene round Brussels.] *Ann. Soc. Géol. Nord*, t. iii. pp. 174–183, figure in text.

Explains how, owing to the presence or absence of the glauconitic clay, the underlying Lackenian beds are sometimes fossiliferous and unaltered, and sometimes unfossiliferous and altered by percolation. This is likewise the case with the upper calciferous Bruxellian. The presence of the Chamois sands having been also proved overlying the glauconitic clay, the true age of the unfossiliferous sands (altered by infiltration) is now demonstrated. G. A. L.

Vanden Broeck, Ernest. Esquisse Géologique et Paléontologique des Dépôts Pliocènes des Environs d'Anvers. [Sketch of the Geology of Antwerp.] Fasc. i., pp. 101. 8vo. *Brussels.* (Forms part of the *Ann. Soc. Mal. Belg.*, although published independently by the Society.)

First instalment of a monograph by the author and **H. Miller**, on the Belgian Pliocene Foraminifera. Describes the Lower Antwerp Sands (formerly called Diestian), giving lists of fossils of the subdivisions. The movement of the area of deposition towards the N.W. by elevation and depression, and the alteration of the deposits by removal of carbonate of lime and oxidation of glauconite, are dwelt on at length, as is the synonymy of the subject. W. H. D.

——. [Account of Excursion to Antwerp.] *Ann. Soc. Mal. Belg.* t. x., *Bull.* pp. xxxv, xxxvi.

Contains geological notes.

——. Note sur la présence de l'argile Oligocène sous les sables Pliocènes du Kiel près d'Anvers. [Occurrence of Oligocene Clay beneath the Pliocene Sands of Kiel, near Antwerp.] *Ann. Soc. Mal. Belg.* t. x., *Bull.* pp. lxxv–lxxviii.

Concludes, from the fact described as characterizing the horizon met with, that there is in Belgium a great gap between the Boom Clay and the overlying Pliocene sands. G. A. L.

——. Notes sur une excursion scientifique en Suisse—Août–Septembre 1875. [Scientific Excursion in Switzerland, in 1875.] *Ann. Soc. Mal. Belg.* t. x., *Bull.* pp. cxxix–clxiii.

Touches on a number of points of geological interest.

Vasseur, Gaston. Sur la couche à Lépidostées de l'argile de Neaufles-Saint-Martin, près Gisors. [The *Lepidosteus* bed of the Neaufles-St.-Martin Clay, near Gisors.] *Bull. Soc. Géol. France*, 3 sér. t. iv. pp. 295–303, pl. vi., 2 figs. in text.

Gives a longitudinal section of the heights of Neaufles, Dangu, and Vesly, and a vertical section of the clay-pit in which the *Lepidosteus* bed is best seen, and where the junction between the Tertiaries and the Chalk is shown. The deposit in question is a true Tertiary bone-bed, between the Lignitic series and the Cuise sands. G. A. L.

Vézian, Alex. La période glaciaire falunienne. [Glaciation in the Period of the Faluns.] *Rev. Sci.* xi. pp. 171–176.

Notices the presumptive evidence of a glacial period at the close of the Eocene, again at the end of the Cretaceous, during the Permian, possibly during the Carboniferous, and again in the Devonian. Enlarges on that during the middle of the Miocene, citing the large erratic blocks of the Superga hill, Turin, and argues that the Swiss "Nagelfluh" was glacial moraine matter brought down into lakes, and there redeposited, by torrential action. E. B. T.

——. La théorie des Systèmes de soulèvement, à propos du système du mont Seny. [The Theory of Systems of Upheaval, with reference to the Mt. Seny System.] *Compt. Rend.* t. lxxxiii. p. 951.

——. Le Jura. [The Jura.] *Ann. Club Alp. Franç.* 2 ann. p. 605.

Orographic and geological sketch.

Vincent, G. Note sur la faune Bruxellienne des environs de Bruxelles. [Bruxellian Fauna in the Neighbourhood of Brussels.] *Ann. Soc. Mal. Belg.* t. x. pp. 23–32.

Gives a sketch of the researches of the older geologists respecting the Bruxellian fossils, followed by a complete list of these fossils, showing their distribution and comparative rarity in the quartzose and in the calcareous sands. The faunal changes are thus shown to have been but slight during the Bruxellian era. G. A. L.

Vincent, G., A. Rutot, and E. Vanden Broeck. [Account of Results respecting the Tertiary Beds round Brussels.] *Moniteur Industriel Belge*, vol. iii. p. 354.

Reports the views of the authors, more especially as to the alteration of parts of the sandy beds in the series.

Viollet-le-Duc, E. Le Massif de Mont Blanc. Étude sur sa Constitution Géodésique et Géologique, sur ses Transformations et sur l'État Ancien et Modern de ses Glaciers. [Mt. Blanc, its Geodesy, Changes, and Glaciers.] Pp. xvi, 280; 112 woodcuts. 8vo. *Paris.*

Chap. 1. Primitive form of Mt. Blanc. 2. Causes of accumulation of snow. 3. Snow and névés. 4. Glaciers and glaciation. 5. Moraines, advance of glaciers. 6. Glacial mud. 7. Formation of torrents. 8. Courses of higher torrents. 9. Torrents and lake-basins. 10. Causes of increase and decrease of the Mt. Blanc glaciers. 11. Topography. 12. Human influence on the action of water. There are geological remarks here and there. W. H. D.

Virlet d'Aoust, —. De l'Age géologique de quelques filons métalliques, et en particulier des filons de mercure. [Age of some

metallic Veins, more especially of Quicksilver.] *Compt. Rend.* t. lxxxiii. p. 289.

Voulot, F. Note géologique et anthropologique sur le Mont Vaudois et la Caverne de Cravanche. [Mt. Vaudois and the Cravanche Cave.] *Compt. Rend.* t. lxxxii. p. 1000.

Vulpian, P. Excursions de la société géologique de France dans la Suisse, la Savoie et la Haute-Savoie. Réunion extraordinaire de 1875. Lettres à un ami. [Excursions in Switzerland and Savoy.] Pp. 108. *Paris.*

Wallon, E. Les montagnes espagnoles de Panticosa, de Sallent et de Canfranc (Aragon). [Mountains of Aragon.] *Ann. Club Alp. Franç.* 2 ann. p. 358.
Contains geological matter.

Walter, Bruno. Die Erzlagerstätten der südlichen Bukowina. [Ore-deposits of S. Bukowina.] *Jahrb. k.-k. geol. Reichs.* Bd. xxvi. Heft 4, pp. 343–426, tab. 18; 13 woodcuts.

Most of the formations contain ores; and these lie generally parallel to the strike of the beds, which is also that of the adjacent Carpathians. [For beds, see **Paul**, p. 101.] True veins are mostly absent, most of the occurrences being analogous to that of a Swedish "fahlband;" the copper-ores occur in the lower part of the crystalline schists, the rich manganese ores are in the middle part, the upper contains iron-ores, &c., each description of ore occurring only in a definite horizon. The younger formations, Trias, Neocomian, &c., contain, for the most part, only iron-ores. The history of the various mines is recounted; and many phenomena observed in mines now abandoned are noted and illustrated by cuts. The copper and iron production has decreased for some time; but the manganese export is rapidly increasing. Analyses of Spiegeleisen, &c., are given. E. B. T.

Watelet, A. Notice sur les sables inférieurs du Soissonnais et sur leurs équivalents. [Lower Sands of the Soissonnais and their Equivalents.] *Ann. Soc. Mal. Belg.* t. x. pp. 111–122, pl. viii.

Believes that the Rilly marls belong to the Soissonnais lignitic group. Describes the following new species:—*Turritella hybrido-sulcifera*, *Natica Laversinensis*, *Cerithium Briarti*, *Cerithium eocenicum*, *Purpura eocenica*, *Rostellaria*? *Suessonensis*, *Pseudoliva Aiziensis*, *Voluta Lefevrei*, *Belosepia Dieuvali*. G. A. L.

Watts, W. L. Iceland: its Scenery and Volcanic Rocks. *Journ. Soc. Arts*, vol. xxiv. no. 1210, pp. 169–175.

Describes rifts in Thingvallir, caused by the cooling of a lava-stream at the surface, the onflow of the melted matter from below, and the sinking of the unsupported crust. Notices the geysers, Mt. Hecla, &c. W. W.

Watts, W. L. On Iceland, its Physical Aspects, Characteristics, &c. *23rd Ann. Rep. Brighton Nat. Hist. Soc.* pp. 78–91.
Describes the volcanoes, geysers, glaciers, &c.

——. Journey across the Vatna Jökull, in the summer of 1875. *Proc. R. Geogr. Soc.* vol. xx. pp. 21–32.
Contains some remarks on the craters visited and the character of the volcanic *ejecta*.

Weiss, E. Blatt Saarlouis. *Erläut. geol. Spezialkarte Preuss.* Gradabth. 80, Bl. 39.
——. Blatt Heusweiler. *Ibid.* Bl. 40.
——. Blatt Friedrichsthal. *Ibid.* Bl. 41.
——. Blatt Neunkirchen. *Ibid.* Bl. 42.
Explanations of these sheets of the Prussian Geological Survey Map, comprising Carboniferous, Permian, Trias, and Drift.

Weiss, E., and H. Grebe. Blatt Gross Hemmersdorf. *Erläut. geol. Spezialkarte Preuss.* Gradabth. 80, Bl. 38; view and section.
Describes Triassic rocks.

Weltz, C. De Trondhjemske Kisforekomsters Oprindelse. [Origin of the Trondhjem Siliceous Deposits.] *Polyteknisk Tidskrift*, Arg. 23, häft 4.

Wibel, F., and C. Gottsche. Skizzen und Beiträge zur Geognosie Hamburgs und seiner Umgebung. [Sketches and Contributions to the Geology of Hamburg and its Neighbourhood.] *Festschrift der 49. Versam. deutsch. Naturf. Aerzte.* (Noticed in *N. Jahrb.*)

Wiik, F. J. Öfversigt af Finlands geologiska förhållanden. [Review of the Geology of Finland.] Pp. 1–104 and 1–89, with a geological index-map of the southern and middle parts of Finland to the scale of 1 : 2,520,000. *Academical paper. Helsingfors.*
The first part refers to the petrographical characters of the rocks, their distribution and stratigraphy. The following formations are described—Laurentian gneiss, Huronian mica schist, Taconic (quartzite-talc schists), eruptive rocks and Post-Tertiary deposits. The origin of the various rocks and superficial deposits is noticed. The second part contains Orography and Geognosy. The author thinks that the stratigraphical and orographical main directions in Finland might be expressed by some few crystallographical zone-lines; and he calls attention to the relation existing between the mountain-chains and the coast-lines of other continents and certain distinct main lines. The origin of the earth, the probable nature of the interior and the different theories on the subject, and the formation of the primitive rocks are noticed. E. E.

Wolf, H. Die Rutschung am Kahlenberg-Gehänge längs der Donau.

[Landslip at the Kahlenberg Slope along the Danube.] *Verh. k.-k. geol. Reichs.* pp. 131–134; see also *Woch. österr. Ing. Ver.* no. 9.

Gives a detailed description of the occurrence, and classifies its causes under five heads, the first two of which, the pulpy nature of the beds and the deep-seated springs, are irremediable, whereas the others could be neutralized by engineering. G. A. L.

Wolf, H. Das Aufnahmsgebiet in Galizisch-Podolien im Jahre 1875. [District surveyed in Galician Podolia in 1875.] *Verh. k.-k. geol. Reichs.* pp. 176–183.

Gives in a table the geological divisions recognized, compared with those made out by Alth in 1874 (see GEOLOGICAL RECORD for 1874, p. 45) and by Stur in 1872. Admits 11 divisions. G. A. L.

——. Reisebericht aus Galizien. [Notes of Travel in Galicia.] *Verh. k.-k. geol. Reichs.* pp. 318, 319.

Entirely geological.

——. Die Bausteinsammlung des österr. Ingenieur- und Architekten-Vereins. [Collection of Building-stones of the Austrian Society of Engineers and Architects.] *Woch. österr. Ing. Ver.* no. 9.

Refers chiefly to Austrian building-stones.

Wurstemberger, Arnold R. C. Ueber Lias Epsilon. [On the ε Lias.] *Jahresh. Ver. Nat. Württ.* Jahrg. 32, pp. 193–233.

Describes the L. Lias of S. Germany, Switzerland, and E. France, adding remarks on *Ichthyosauri*, with description of *I. longipes*, n. sp.

Zezi, P. Cenno intorno ai lavori del Comitato geologico nel 1875. [Sketch of Work of the Italian Geological Commission in 1875.] *Boll. R. Com. geol. Ital.* vii. pp. 3–6.

Mentions the progress of the map of the Monte Viso district, scale 1 : 50,000; that of the Messina and Reggio (Calabria) districts, on same scale; also one of the Monte Pisano, scale 1 : 80,000, and another of Massa Marittima district, &c. &c. E. B. T.

——. Osservazioni geologiche fatte nei dintorni di Ferentino e di Frosinone nella provincia di Roma. [Geology of Frosinone, &c.] *Boll. R. Com. geol. Ital.* vii. pp. 360–388; 3 woodcuts.

The hills consist chiefly of Eocene limestone or Miocene (?) sandstone, the Pliocene being absent. In depressions among these lies the Quaternary travertin. Several Quaternary volcanoes are noted; the lavas all augitic; some show cones or craters, some only peperino and ashes, others lava-streams. E. B. T.

Ziegler, Prof. M. Ueber das Verhältniss der Topographie zur Geologie. Text zur topographischen Karte vom Engadin und Bernina.

[Topography and Geology. Text to accompany topographical maps of the Engadine and Bernina.] 4to. *Zürich.* (Ed. 2. *Winterthur*).

The maps consist of six sheets. Scale 1 : 50,000.

Zuaznavar, M. Algunos datos de la cuença carbonifera de Juarros en la provincia de Burgos. [The Carboniferous Beds of Juarros in the Province of Burgos.] *Bol. Com. map. geol. Españ.* t. iii. pp. 353–358.

3. *ARCTIC REGIONS.*

Brown, Dr. R. The Countries of the World. Vol. i. parts 1–4, pp. 1–128. *London.*
Describes the Arctic regions and their glacial phenomena.

De Rance, C. E. Known Facts and unknown Problems of Arctic Geology. *Proc. Geol. Assoc.* vol. iv. no. 8, pp. 460–480.
The Palæozoic rocks of the islands of the Arctic Regions, Silurian (Wenlock) Limestones, Coal-bearing Sandstones of the Ursa Stage of Heer, and Mountain Limestone capped by Lias, occur in a trough, the axis of which trends E.N.E. towards the entrance of Smith's Sound, and rest on Laurentian gneiss and granite, which also forms the larger portion of Greenland. In W. Greenland the gneiss is overlain by Cretaceous and Miocene plant-bearing beds at Disco Island, associated with basalts, in which occur the Greensand meteorites. In E. Greenland, beneath the Miocene, occur Oolitic rocks, containing a fauna with Russian affinities. C. E. D.

Helland, Amund. Om de isfyldte Fjorde og de glaciale Dannelser i Nordgrönland. [The Ice-filled Fjords and Glacial Formations of N. Greenland.] *Arch. Math. Naturvid.* Bd. i. pp. 59–125, map and plate.
Noticed by mistake in the Geological Record for 1875, p. 110.

Markham, C. R. The Results of the Arctic Expedition. [Report of Lecture at the London Institution.] *Standard* and *Daily News*, Dec. 21. Reprinted as pamphlet, 1877.
Describes ice-action, coal-seams, &c.

Nordenskiöld, Prof. A. E. Übersicht der Geologie des Eisfjordes und Bellsoundes. [Sketch of the Geology of Icefjord and Bellsound, Spitzbergen.] *K. Svenska Vet.-Akad. Handlingar*, Bd. 14, i. pp. 94–133; 19 fig. in text. In English in *Geol. Mag.* dec. ii. vol. iii. pp. 16–23, 63–75, 118–127, 255–268. See also *post*, Palæontology (Plants), under **Heer.**
The same as the paper, under a different title, noticed in the Geological Record for 1875, p. 110.

Payer, Lieut. Julius. New Lands within the Arctic Circle. Narrative of the Discoveries of the Arctic ship 'Tegethoff' in 1872–74. 2 vols., maps and illustrations. 8vo. *London.*
Contains many details on points in glacial geology. In Chap. 1, The "Frozen Ocean," the characteristics of field-ice, pack-ice, hummocks, icebergs, and various other forms are described. G. A. L.

Petitot, Abbé E. Géographie de l'Athabaskaw-Mackenzie et des grands lacs du bassin arctique. [Geography of the Athabaskaw-Mackenzie and of the Great Lakes of the Arctic Basin.] *Paris.* [Dated 1875, but not published until 1876.]

Touches on many geological subjects.

Rink, H. Om Grönlands Inland og muligheden af at berejse samme. [The Inland Part of Greenland and the Possibility of travelling there.] *Fra Videnskabens Verden. Kjöbenhavn*, 1875, ii. no. 9, pp. 125-175.

After some remarks as to the form and size of the island, and on the former ideas of the condition of the country and its ice-sheet, the author gives an account of this ice-sheet (inland-ice) and of its supposed origin and continued formation. E. E.

Schmidt, Prof. Friedrich. The Tertiary Formations on the Northern Shores of the Pacific. *St. Petersburg Society of Naturalists. Nature*, vol. xv. p. 88.

The continental Miocenes, with coal-seams and plants, extend along the Amoor basin, Kamtchatka, Alaska, Vancouver Island, to the Mackenzie river, Greenland, and Spitzbergen. The newer marine Pliocene deposits contain 80 species of Mollusca, of which 18 are extinct, 6 only inhabit the Polar sea, and the remaining 56 the N. Pacific. A connexion between the Pacific and Atlantic existed across the Polar sea. C. E. D.

4. *AMERICA.*

Abert, S. T. Report of a Survey of a Line to connect the Waters of the Neuse and Cape Fear River in North Carolina, and of a line to connect the waters of Norfolk Harbor in Virginia with the waters of Cape Fear River, at or near Wilmington, in North Carolina. *Engineer Department, U. S.*, no. 35.

Contains much matter on the physical features of the coast, and on the changes which have been and are still going on there as to the limits and depths of the Sound, and the extent and outline of the sea-made lands. (Noticed in *Amer. Journ.* ser. 3, vol. xii. p. 149.) G. A. L.

Ackermann, —. Die Kupferführenden Schichten am Lake Superior. [Copper-bearing Beds of Lake Superior.] *Sitz. Isis Dresden*, for 1875, pp. 101–105.

Agassiz, Prof. A. Recent Corals from Tilibiche, Peru, nearly 3000 feet above the sea-level. *Bull. Comp. Zool.* vol. iii. See also *Nature*, vol. xiv. pp. 217, 218.

These corals, indicating a former extension of the sea to that level, have yet a very modern aspect.

Agassiz, Prof. A., and **S. W. Garman.** Exploration of Lake Titicaca. *Bull. Mus. Comp. Zool.* vol. iii. p. 274.

Carboniferous and Devonian rocks are described.

Allen, J. A. The Little Missouri "Bad Lands." *Amer. Nat.* vol. x. pp. 207–216.

Describes the scenery of these Bad Lands in Dakotah. The lignites interbedded with the sands and clays appear to be liable to spontaneous combustion; so that, whenever exposed to the atmosphere, they are reduced to cinders, and the associated clays and sands are highly metamorphosed for a distance sometimes of 40 or 50 feet from the original seam. H. A. N.

Anon. Explorations in Colorado under Professor Hayden in 1875. *Amer. Nat.* vol. x. pp. 161–165.

Summarizes the work carried out by the United States Survey of the Territories, and gives an account of the discoveries made.

——. Extinct Coral-reef at Bahia. *Amer. Nat.* vol. x. pp. 439, 440.

Gives an account of an extinct fringing-reef off the island of Itaparica, in the Bay of Bahia.

Anon. Mastodon in Wyoming Co., N.Y. *Land and Water*, vol. xxii. p. 25.

Bones of a supposed Mastodon have been discovered; "no bones or teeth were found more than 10 or 12 inches below the surface of the marl," the main portion occurring in the upper marshy ground. G. H. K.

——. Magdalen Islands. *Land and Water*, vol. xxii. p. 251. From the *Halifax Church Chronicle*.

There are said to be 11 islands in the group, although some are joined together by sand-ridges and marshes. The rocks are sedimentary and igneous, the former much cut up and displaced by the latter, and form in places bold scenery and perpendicular cliffs. G. H. K.

——. American Nickel Mines. *Land and Water*, vol. xxii. p. 252. From the *Southport American*.

Notices a deposit of nickel near the Gap, Lancaster county, Pa. The ore is associated with copper, iron, and lime.

——. An Alabama Subterrestrial Lake. *Land and Water*, vol. xxii. p. 282. From the *Montgomery Bulletin*.

Describes a flat at Dickenson's Place on the Ballard Creek. It is a 10-acre field floating on a lake; a hole over two feet deep reaches water; the whole field can be shaken by a person jumping on it, yet the envelope is strong enough to be cultivated by men, but it will not bear the weight of a horse. G. H. K.

——. The Empire of Brazil at the Universal Exhibition of 1876 in Philadelphia. *Rio de Janeiro*. [See *Quart. Journ. Sci.* n. s. vol. vii. p. 119.]

Mineral products noticed.

Barcena, Mariano. Noticia Geologica de una parte del Estado del Aquas-calientes. [Geology of Part of the Aquas-calientes Region.] *Mexico*.

Barrett, Dr. S. T. [Lower Helderberg of Port Jervis, N. Y.] *Ann. Lyc. Nat. Hist. N. York*, vol. xi. Abridgment in *Amer. Journ.* vol. xiii. pp. 385–387 (1877).

Berthoud, Edward L. On Rifts of Ice in the Rocks near the summit of Mt. McClellan, Colorado, and on the different Limits of Vegetation on adjoining summits in the Territory. *Amer. Journ.* ser. 3, vol. xi. pp. 108–111.

The presence of permanent underground ice in mines to the N.W. has been explained by the suggestion that it had remained there since the Glacial Period (see **R. Weiser,** GEOLOGICAL RECORD for 1874, p. 180). The case here described is due to local causes, such as "the loose nature of the soil and deep rocky débris of the mountain." G. A. L.

Bigg-Wither, T. P. The Valley of the Tibagy, Brazil. *Proc. R. Geogr. Soc.* vol. xx. pp. 455–468.

The rocks are mostly granite overlain by sandstone. Trap dykes cause many waterfalls and rapids.

Bradley, Frank H. On a "Geological Chart of the United States east of the Rocky Mountains, and of Canada." *Amer. Journ.* ser. 3, vol. xii. pp. 286–291.

Describes the new features of this compilation.

Broadhead, Prof. G. C. Age of our Porphyries. *Trans. Ac. Sci. St. Louis*, vol. iii. pp. 366–370.

These S.E. Missouri porphyries (with which granite is associated) have been regarded as Huronian. The writer inclines to the view that the granites are older than the porphyries. G. A. L.

Brooks, T. B. On the youngest Huronian Rocks south of Lake Superior, and the age of the Copper-bearing Series. *Amer. Journ.* ser. 3, vol. xi. pp. 206–211.

Urges that the granitoid formation W. and S. of the Menominee River, about 90 miles from its mouth, is Huronian, and probably the youngest member of the series. This granitoid formation is unconformably overlain by the copper-bearing rocks, which are regarded as an independent series marking a definite geological period between the Silurian and Huronian. G. A. L.

——. Classified List of Rocks observed in the Huronian Series, south of Lake Superior, with remarks on their abundance, transitions, and geographical distribution; also a tabular presentation of the Sequence of the Beds, with an Hypothesis of Equivalency. *Amer. Journ.* ser. 3, vol. xii. pp. 194–204, folding table.

Compares the developments of the series in the table as known in—1. Canada, N. of L. Huron; 2. Marquette Iron region, Michigan; 3. Menominee Iron region, Michigan and Wisconsin; 4. Black River series, Michigan; and 5. Bad River and Penokie Gap, Wisconsin. G. A. L.

Brown, C. B. Canoe and Camp Life in British Guiana. 8vo. *London.*

Contains geological matter.

Buckley, Dr. S. B. Second Annual Report of the Geological and Agricultural Survey of Texas. 99 pp. 8vo. *Houston, Texas.*

Burmeister, Dr. H. Description physique de la République Argentine, d'après les observations personnelles et étrangères. [Physical Description of the Argentine Republic.] Translated from the German by **E. Maupas.** T. 1, pp. 400. *Paris.*

Carll, John F. Report of Progress in the Venango County District. Observations on Geology around Warren, by **F. A. Randall.** Note on the Comparative Geology of North-eastern Ohio and North-

western Pennsylvania, and Western New York, by [**Prof.**] **J. P. Lesley.** *2nd Geol. Survey of Pennsylvania.* Pp. 132, map, and illustrations. 8vo.

Chapman, Prof. E. J. On the Leading Geological Areas of Canada. *Canad. Journ.* pp. 92–121.

Continuation of a paper noticed in the Geological Record for 1875, p. 115. Deals with the principal geological areas in the provinces of Quebec, New Brunswick, and Nova Scotia, giving a condensed account of the more important geological features of each. H. A. N.

——. An Outline of the Geology of Canada. Pp. 106, maps, and 6 plates (fossils). 8vo. *Toronto.*

Cox, Prof. E. T. Seventh Annual Report of the Geological Survey of Indiana, made during the year 1875. Pp. 601, 2 pls., 4 maps in pocket. 8vo. *Indianapolis.*

Vigo County consists of Carboniferous rocks, and Huntington County of Niagara Beds, both more or less concealed by Quaternary deposits. **Prof. L. Lesquereux** describes and (except the third) figures 5 new Coal-Measure plants—*Paleophycus Milleri*, *P. gracilis*, *P. divaricatus*, *Asterophycus Coxii*, and *Conostichus ornatus* (the last from Illinois). **Prof. W. W. Borden** describes Jennings and Ripley Counties as composed of U. and L. Silurian, with Devonian in the first. The Quaternary deposits are of the Glacial, Champlain, and Recent epochs. **Dr. M. N. Elrod** and **Dr. E. S. McIntire** describe Orange County as wholly Carboniferous and Quaternary. **Prof. John Collett** describes Vanderburg, Owen, Montgomery, and parts of Clay and Putnam Counties. Beside superficial deposits there are Devonian rocks in Montgomery Co. only, Carboniferous in all, and Triassic in Vanderburg Co. only. Sections, lists of fossils, and analyses of coals, limestones, and mineral waters are given abundantly throughout. W. H. D.

Creveau, Jules. Faux blocs erratiques de la Plata. [False Erratic Blocks of La Plata.] *Bull. Soc. Géol. France,* 3 sér. t. iv. pp. 304–308, plate vii.

The blocks, which occur in the Pampas and were pronounced to be of Glacial origin, are shown to be rounded rocks, more or less in place, and to partake of the nature of tors. G. A. L.

Crosby, W. O. Report on the Geological Map of Massachusetts. Pp. 52. 8vo. *Boston.*

Description of rocks coloured on the map. (See *post*, Maps.) Account of the geology of the Nashua Valley, by **L. S. Burbank**, pp. 43–52.

Dall, W. H. Harbors of Alaska and the Tides and Currents in their vicinity. *United States Coast Survey Report for* 1875, *Appendix* 10.

The Shumagu Islands, S. of the Alaska Peninsula, are composed of

granite, metamorphic rocks, and sandstones, overlain by Tertiary beds, the upper part of which are Miocene. G. A. L.

Dana, Prof. J. D. Note on the "Chloritic formation" on the western border of the New Haven Region. *Amer. Journ.* ser. 3, vol. xi. pp. 119–122.

Gives the petrographical characters of the massive and slaty rocks in this formation. They are metamorphic; and the former contain labradorite as a prominent constituent, and are in appearance very like trap. The formation contains two or more beds of limestone, and is probably L. Silurian. The labradorite is perhaps due to two conditions in the original mud-beds—the presence of a comparatively small percentage of silica, and of disseminated carbonate of lime from fossils. G. A. L.

——. Green Mountains. *Amer. Journ.* ser. 3, vol. xi. p. 151.

Corrects some topographical descriptions. The metamorphic rocks of which these mountains consist are not younger than Silurian; but the trap-ridges of the Connecticut Valley are Jurassic. G. A. L.

——. On the Damming of Streams by drift ice during the melting of the great Glacier. *Amer. Journ.* ser. 3, vol. xi. pp. 178–180.

Gives reasons for thinking that the height of the upper terraces, above the narrows of the rivers of the district referred to, was partly owing to the cause mentioned in the title. (See Geological Record for 1875, p. 118.) G. A. L.

——. Glacial Flood. *Amer. Journ.* ser. 3, vol. xii. pp. 64, 65.

Refers to a paper by Prof. Winchell "On the Drift-deposits of the North-west," in the *Pop. Sci. Monthly*, July 1873.

——. [Glacial action in America.] *N. Jahrb.* Heft i. p. 43.

The tibia of a reindeer has recently been got from a Glacial clay, 4 miles N. of New Haven.

Darwin, Charles. Geological Observations on the Volcanic Islands and parts of South America visited during the Voyage of H.M.S. 'Beagle.' Ed. 2, pp. xiii, 647, maps, sections, and plates of fossils. 8vo. *London.*

Except for verbal corrections and alterations, and the addition of some supplementary observations on the thickness of the Pampean formation near Buenos Ayres (pp. 363–369) (from *Quart. Journ. Geol. Soc.* 1862), this is identical with the first edition. Pp. 1–185 refer to the Volcanic Islands, and pp. 187–627 to S. America. J. W. J.

Dawkins, Prof. W. B. On Silver Mining in Nevada. *Proc. Lit. Phil. Soc. Manch.* vol. xv. pp. 141, 142.

Silver lodes 12 feet wide occur 12 miles from Batch Mountain, a station on the Central Pacific Railway.

Dawson, Dr. J. W. Notes on the Occurrence of *Eozoon canadense*

at Côte St. Pierre. *Quart. Journ. Geol. Soc.* vol. xxxii. pp. 66–74, pl. x.

Describes the section (in Ottawa) and the structure of specimens proving organic nature. 2 varieties are named *minor* and *acervulina*.

Ellis, General T. G. Report on the Connecticut River. In the *Annual Report of the Chief of Engineers to the Secretary of War for the year* 1875.

The amount of discharge of the river at Hartford is given for each day for nearly 4 years, with notes on sediment carried, and other remarks of geological interest.

Fontaine, Prof. William M. The Conglomerate Series of West Virginia. *Amer. Journ.* ser. 3, vol. xi. pp. 276–284, 374–384.

Describes in detail the rocks underlying the Great Conglomerate of the Kanawha Falls, and suggests for them the name "Sub-conglomerate" or "Lower Carboniferous," but prefers the term "Conglomerate series." Gives measured sections of the beds, from the mouth of Piney River, Raleigh County, of the Transition and Umbral Series at Quinnimont. Two horizons have yielded plants, 27 species of which are enumerated. These are of ordinary Coal Measure and Canadian Devonian types. From the base of the series at Quinnimont some Carboniferous Limestone invertebrate forms were obtained, two only, *Productus Cora* and *Spirifera Leidyi*, being specifically identified. G. A. L.

——. Resources of West Virginia.

Chapter on the Coalfield of West Virginia by **Maury.**

Fraser, Prof. P., Jun. Report of Progress in the District of York and Adams Counties. *Second Geological Survey of Pennsylvania.* Pp. 196, maps and sections. 8vo. *Harrisburg, Pa.*

Describes a belt of granular limestone and hydromica slates with limonite beds and trap rocks, giving analyses of the first three. The slates are unconformable to the limestones. W. H. D.

Gilbert, Prof. G. K. On the Outlet of the Great Salt Lake. *Amer. Journ.* ser. 3, vol. xi. pp. 228, 229.

The overflow of the lake was probably northward, by the Columbia River.

——. The Colorado Plateau Province as a Field for Geological Study. *Amer. Journ.* ser. 3, vol. xii. pp. 16–24, 85–103; 3 figures in text.

Divided under the following heads:—i. Definition and Description of the Province. ii. How the material is exposed for study. iii. The material for study. Mountain building by eruption. Stratigraphy. The rest is headed Part ii.; and the subjects discussed refer to erosion, viz.:—The problem of the Cañons. Transportation and Comminution. Transportation and Declivity. Transportation and quantity of water.

Corrosion. The Problem of Waterfalls. The Problem of Inconsequent Drainage. Summary. G. A. L.

Gilmore, Gen. Q. A. [On the Channel of the Entrance to Cumberland Sound.] *Report of the Chief of Engineers to the Secretary of War for the year* 1876.

Discusses the formation and growth of bars. Fernandina bar is a combination of a drift-bar and a wave-bar, and is not a delta-bar.

Gorceix, H. Les exploitations de l'or dans la province de Minas Geraes (Brésil). [Gold-workings in Minas Geraes, Brazil.] *Bull. Soc. Geogr. Paris*, 6 sér. t. xii. pp. 530–543.

Most of the formerly-rich reefs are abandoned; and the few still worked scarcely pay. None have, however, been worked with the necessary knowledge or on a sufficient scale. The localities more particularly described are Morro Velho and Oura-Preto. G. A. L.

Grinnell, G. B., and E. S. Dana. On a new Tertiary Lake Basin. *Amer. Journ.* ser. 3, vol xi. pp. 126–128.

Describe deposits near Camp Baker, Montana, indicating the existence of a Miocene lake-basin succeeded by a Pliocene one. At the junction of the Pliocene and Miocene beds, where well marked, is about six feet of hard sands and pebbles. The height is over 5000 feet. G. A. L.

Hall, Charles E. Notes on Glacial Action visible along the Kittatinny or Blue Mountain, Carbon, Northampton, and Monroe Counties, Pennsylvania. *Proc. Amer. Phil. Soc.* vol. xiv. pp. 620, 621.

——. On Glacial Deposits at West Philadelphia. *Ibid.* pp. 633, 634, map.

Hall, Prof. James. Note upon the Geological position of the Serpentine Limestone of Northern New York, and an inquiry regarding the relations of this Limestone to the Eozoon Limestones of Canada. Abstract in the *Buffalo Courier*, Aug. 25, reproduced in *Amer. Journ.* ser. 3, vol. xii. pp. 298–300.

Hartt, Ch. H. The Geological Survey of Brazil. First Preliminary Report made to the Councellor Thomaz José Coelho de Almeida, Minister and Secretary of State for Agriculture, etc. Translated from the Portuguese manuscript (not yet published) by **Prof. T. B. Comstock**. *Amer. Journ.* ser. 3, vol. xi. pp. 466–473.

Gives details of the work done and proposed to be done.

Hawes, G. W. The Greenstones of New Hampshire and their organic remains. *Amer. Journ.* ser. 3, vol. xii. pp. 129–137, plate v.

These greenstones ("chloritic and talcose schists" of Hitchcock, who looks upon them as Huronian) cover a large area in the N. of the State. They are metamorphosed sedimentary rocks, and are described, petro-

graphically and chemically, under the names:—Metamorphic diorite; Metamorphic diabase, containing microscopic remains resembling *Chætetes* (perhaps foraminiferal) and *Stromatopora*; Chloritic schist; Metadiabase schist; and Argyllite. Analyses and microscopic representations of the rock are given. G. A. L.

Hayden, Dr. F. V. Annual Report of the United States Geological and Geographical Survey of the Territories, embracing Colorado and Parts of Adjacent Territories, &c. Pp. x, 515; 82 plates (maps, sections, views, fossils). 8vo. *Washington.*

Contains the following Reports:—**Dr. F. V. Hayden**: treating of the Lignitic Group, the eastern base of the Front or Colorado Range, Ancient Lake Basins, &c.; and the Geology of the Elk Mountains, with a Report on the Geology of the N.W. portion of the Elk Range, by **W. D. Holmes**, pp. 19–71.

Dr. A. C. Peale on the Geology of the Eagle, Grand, and Gunnison Rivers, with catalogues of minerals and rocks, pp. 73–180.

Dr. F. M. Endlich on the San Juan district, with a chapter on Mines (which also occurs, almost entire, in *Bull. U. S. Geol. Surv. Territories*, see *post*, under APPLIED GEOLOGY), pp. 181–240.

Dr. S. Aughey: The Superficial Deposits of Nebraska, pp. 243–269.

Prof. L. Lesquereux on the Tertiary and Cretaceous Flora, pp. 271–365. See *post*, under PLANTS.

The other Reports are not geological. W. H. D. & W. W.

——. Notes descriptive of some geological sections of the country about the headwaters of the Missouri and Yellowstone Rivers. *Bull. U. S. Geol. Surv. Territories*, vol. ii. no. 3, pp. 197–209, plates i–x.

In Montana granite appears on the anticlinal axis, trending N.W. between the Jefferson and Madison Rivers, throwing off the Silurian, Carboniferous, Triassic, Jurassic, Cretaceous, and Lignitic rocks, over the edges of all which volcanic tuff, breccia, and trachyte lie unconformably. Miocene, Pliocene, and Postpliocene lacustrine beds form terraces along the valleys. The auriferous gravels date back to the Glacial period. The volcanic rocks are of various dates, some being Postglacial. W. H. D.

——. Notes on the Lignitic group of Eastern Colorado and portions of Wyoming. *Bull. U. S. Geol. Surv. Territories*, ser. 2, no. 5, pp. 401–411.

Near Cañon City is a section of the Cretaceous series, from the Dakota to the top of the Fox Hills group. The lowest Tertiary is sandstone and clay, 300 feet thick, without fossils. Next is sandstone with many fossil plants, 50 to 200 feet thick, underlying the bottom coal. The Lignitic series is of brackish-water origin, no marine animal ranging into it from the Fox Hills group, to which it is unconformable. Beds of lignite occur in the Washakie group, which is of freshwater origin and unconformable to the Lignitic. The same with the higher

Bridger and Green River groups. Beds of lignite occur throughout the Cretaceous of S. and S.E. Colorado, and also in Utah and Wyoming. The upper part of the Cretaceous overlaps the lower. A few stratigraphical details are given. W. H. D.

Hayden, Dr. F. V. The Grotto Geyser of the Yellowstone National Park. (*U. S. Geol. Surv. Terr.*) Fol. Pp. 6; 2 plates (view and map).

Account of the Geyser, with analysis of its deposits, by **Dr. A. C. Peale.**

——. Note on the ore-bearing rocks of Colorado. *Amer. Journ.* ser. 3, vol. xii. p. 71.

Corrects the statement in *Ann. Rep. U. S. Geol. Surv. Territories* for 1874, p. 4, that the Archæan rocks alone are ore-bearing in Colorado. Silurian (?) and volcanic rocks are ore-bearing in some parts. G. A. L.

Hitchcock, Prof. C. H. Atlantic System of Mountains. *Appalachia*, vol. i. no. 1.

Holmes, Judge —. Man and the Elephant in Nebraska. *Proc. Ac. Sci. St. Louis*, vol. iii. pp. ccxiii, ccxiv.

Argues that the discoveries of Dr. S. Aughey in Nebraska "are not open to the same kind of explanation [as those of Dr. Koch], and seem to afford the necessary confirmation of the supposed contemporaneity of man and the mastodon and elephant in this [the Missouri] valley." G. A. L.

Holmes, W. H. A Notice of the Ancient Ruins of South-western Colorado, examined during the Summer of 1875. *Bull. U. S. Geol. Surv. Territories*, vol. ii. p. 1.

Plate 6 has a geological section of the cañon-wall.

Howell, Edwin E. Report on the Geology of portions of our Western Territory visited in the years 1872 and 1873. Pp. 70. 4to. *Washington.*

Hunt, Dr. T. S. The Quebec Group in Geology. *Proc. Boston Soc. Nat. Hist.* vol. xix. pp. 2–4, abstract.

The name "Quebec Group" given by Logan is misleading, as it includes several unconformable groups—Laurentian, Cambrian, and L. Silurian. W. H. D.

Irving, Roland. Note "On the youngest Huronian rocks South of Lake Superior." *Amer. Journ.* ser. 3, vol. xi. p. 493.

Corrects a statement by T. B. Brooks (see p. 129).

Jackson, James. Explorations faites sous la direction du Docteur F. V. Hayden pendant l'année 1875 dans les territoires de l'Ouest des États Unis. [*Résumé* of Hayden's Surveys in 1875.] *Bull. Soc. Géogr. Paris*, 6 sér. t. xii. pp. 196–199.

Jenney, J. P. The Mineral Wealth, Climate and Rainfall, and Natural Resources of the Black Hills, Dakotah. Pp. 71. 8vo. *Washington.*

Kayser, E., and **H. Geinitz.** Beiträge zur Geologie und Paläontologie der Argentinischen Republik. [Argentine Geology.] *Zeitsch. deutsch. geol. Ges.* Bd. xxviii. Heft 3, pp. 649, 650.

A notice of the first and second parts of this work.

Kimball, James P. On the occurrence of Grahamite in the Huasteca, Mexico, and Notice of the Geology of that Region. *Amer. Journ.* ser. 3, vol. xii. pp. 277–286, woodcut.

The grahamite is an altered asphalt similar to other "coal" deposits in the Huasteca "coalfield." They all occur in connexion with a fossiliferous shale, at first supposed Cretaceous but now Tertiary. The Cristo Mine deposit is described. Analyses are given. G. A. L.

King, Clarence. Paleozoic subdivisions on the 40th Parallel. *Amer. Journ.* ser. 3, vol. xi. pp. 475–482.

Announces the stratigraphical divisions established in the field, and their relation to the Palæozoic subdivisions of New York and the Mississippi basin. In passing westward the entire series, from the Coal Measures to the Potsdam beds inclusive, thickens from 1000 to 32,000 feet. Near Battle Mountain an Archæan land-mass rose to the W. of the Palæozoic ocean. No trace of unconformity has been detected between any of the members of the series. The following are the subdivisions in ascending order:—1. A great series of quartzites and argillites with Primordial fossils at top, about 12,000 feet thick, Cambrian. 2. The Ute limestone, 2000 feet, with fossils of the Quebec group. 3. The Ogden Quartzite, 1000 feet. 4. The Wahsatch Limestone, 7000 feet, including Devonian, Subcarboniferous, and L. Coal Measures. 5. The Weber Quartzite, 6000 feet, representing the Middle Coal Measures. 6. U. Coal Measures, 2000 feet. 7. Permian or Permo-carboniferous, 500 feet. G. A. L.

——. Note on the Uinta and Wahsatch Ranges: a Correction. *Amer. Journ.* ser. 3, vol. xi. p. 494.

The more important uplift of these ranges took place at the close of the Cretaceous and not of the Jurassic period, as was stated in the Report of the U. S. Geol. Exploration of the 40th Parallel, vol. iii. chap. 7. G. A. L.

——. Report with reference to the geological exploration of the 40th Parallel. In the *Annual Report of the Chief of Engineers to the Secretary of War for the year* 1875.

Le Conte, Prof. Joseph. On the Evidence of horizontal crushing in the formation of the Coast Range of California. *Amer. Journ.* ser. 3, vol. xi. pp. 297–304; 2 figures in text.

The evidence consists of observations on the stratigraphical structure

of the Coast Range, sections across which show more or less sharp folds without any central core, and the occurrence of flattened nodules in connexion with lignites, regarded as representing clay pellets rolled and deposited when the coaly matter was in a semiliquid state, and subsequently deformed by pressure in the formation of the mountain-chain. G. A. L.

Lesley, [Prof.] J. P. Historical Sketch of Geological Explorations in Pennsylvania and other States. With an Appendix containing the Annual Reports of the State Geologist to the Board of Commissioners. *Second Geological Survey of Pennsylvania*, pp. xxvi, 200. 8vo. *Harrisburg*.

Little, Dr. George. Second Report of Progress of the Mineralogical, Geological, and Physical Survey of the State of Georgia for 1875. Pp. 16. 8vo.

A preliminary general Report. A list of the minerals, metals, and building-stones found in 76 counties of the state is given.

Lloyd, T. G. B. Geological Notes from the State of New York. *Quart. Journ. Geol. Soc.* vol. xxxii. pp. 76–79, abstract.

Describes glacial beds, striæ, &c., and flower-pot shaped blocks of Potsdam sandstone in Jefferson County.

Ludlow, Capt. W. Report of a Reconnaissance from Carroll, Montana Territory on the Upper Missouri, to the Yellowstone National Park and return, made in the summer of 1875. *Ann. Rep. Chief Engineers*. Appendix NN, pp. 142; plates. 8vo.

E. S. Dana and **G. B. Grinnell** report on the geology. For Palæontology, see *post*, under **Whitfield**.

Marks, W. D. On the occurrence of native Zinc. *Amer. Journ.* ser. 3, vol. xi. p. 234.

Note of occurrence in the soil along the course of a vein in the blue limestone of Sand Mountain, N.W. Alabama.

Martin, Prof. D. S. On the Rocks of New York Island and their relation to the geology of the Middle States. *Proc. Liverpool Geol. Soc.* part ii. vol. iii. pp. 118–122.

The form of the island is due to the uniform N.N.E. strike of the gneissoid schist of which it is composed. The ridge on which New York stands is part of a range of crystalline rocks running parallel to the Atlantic coast for 700 miles, and dividing the Triassic from the Cretaceous rocks, the former lying on the W. flanks and dipping westward, the latter on the E. and dipping eastward. C. E. D.

Mayne-Reid, Capt. On Lakes covered by a Matrass of entangled Vegetation. *Land and Water*, March 4, p. 180.

Chalco and Xochimilco Lakes in the S. part of the Plain of Mexico

are covered by a tangled mass of aquatic plants, whose roots entwine to form a floating covering so close and tough in places as to permit depasturage by horses and cattle. G. H. K.

Mayne-Reid, Capt. Mexican Lake Tezcoco. *Land and Water*, April 22, p. 307.

The country about the lake is covered with a saline efflorescence, the lake having shrunk since the time of Cortez. An analysis of the water by M. Berthier is given, from which we learn that, although saline, yet it differs from that of the ocean, as it contains scarcely any common salt, the chief salt being sesquicarbonate of soda. G. H. K.

Morgan, C. L. On the Drift of Brazil. *Quart. Journ. Geol. Soc.* vol. xxxii. *Proceedings*, pp. 129, 130, abstract.

Boulders occur at high levels; but neither they nor the underlying rock-surfaces show glacial scratches. If ice-borne, the drift is probably due to a continental ice-sheet. W. H. D.

Mudge, B. F. Notes on the Tertiary and Cretaceous Periods of Kansas. *Bull. U. S. Geol. Surv. Territories*, vol. ii. no. 3, pp. 211–221.

The general dip throughout the State is N.W., about 5 feet in a mile. The Pliocene beds are freshwater sandstones, about 400 feet thick, with silicified mammalian bones, one of which, from the base of the series, suggests a Miocene date. They rest conformably on the Cretaceous. The latter series is 960 feet thick, divided into Niobrara and Dakota Beds. The Niobrara proper is calcareous shale with beds of flintless chalk, 75 to 200 feet thick, abounding in fish, sauria, and birds, including several new genera and species. Analyses of Saurian coprolite and prairie-soil are given. The Fort Hays (L. Niobrara) beds are 260 feet thick; generally massive limestone based on shale and sandstone. The lower part may represent the Benton series. The Dakota group is sandstone 500 feet thick, conformable to the Fort Hays division. Fossil leaves are abundant (see **Lesquereux**, *post*, under PLANTS). A few seams of poor lignite are worked in this group, which includes Nos. 2 and 3 of Swallow's "Triassic" series, the rest of which are Permo-Carboniferous. W. H. D.

Müller, Fritz. On Brazil Kitchen Middens. *Nature*, vol. xiii. pp. 304, 305.

Describes the "Sambaquis" or "Casquciros"—hillocks of shells accumulated by the ancient inhabitants of the west, from which the sea has now retreated some miles. Those containing an extinct *Corbula* were associated with fragments of very thick human skulls. C. E. D.

Newberry, Prof. J. S. The Geology in Capt. J. N. Macomb's Report of the exploring expedition from Santa Fé, New Mexico, to the junction of the Grand and Green Rivers of the Great Colorado of the West, in 1859. Pp. 152.; maps. *Engineering Dept. U.S. Army*, 4to. *Washington.*

Orton, Prof. James. The Andes and the Amazon; or, Across the Continent of South America. Ed. 3, containing Notes of a Second Journey. Pp. 645, maps and illustrations. 12mo. *New York.*
Contains many geological notes and disquisitions.

Packard, A. S., Jun. On the supposed ancient outlet of Great Salt Lake. *Bull. U. S. Geol. Surv. Territories*, ser. 2, no. 5, pp. 413, 414.
The outlet is Skull Valley (100 feet above the lake), thence to Sevier Lake Valley, from this either by the Colorado or into Dry Lake Basin (70 feet below sea level), and so to the Gulf of California or Bay of San Diego. W. H. D.

——. The Great Salt Lake in former Times. *Amer. Nat.* vol. x. pp. 675–681.
Reviews the history of the lake during Post-tertiary times.

Patterson, W. J. Brief Notes relating to the resources, industries, &c. of Newfoundland. *Montreal.*

Pinart, A. [Note on the Exploration of Shell-mounds N. of San Francisco Bay.] *Bull. Soc. Géogr. Paris*, 6 sér. t. xi. p. 447.

Platt, Franklin. Report of Progress in the Clearfield and Jefferson District of the Bituminous Coalfields of Western Pennsylvania. *Second Geological Survey of Pennsylvania.* Pp. viii, 296; 10 maps and sections, 139 woodcuts. 8vo. *Harrisburg.*

Powell, J. W. Report on the Geology of the Eastern Portion of the Uinta Mountains and a Region of Country adjacent thereto. Pp. vii, 218; 4 plates (view and sections). 4to. *Washington.* Large fol. atlas (maps, sections, and diagrams).
Chap. i. treats of the geographic characteristics and orographic structure of the Basin, Plateau, and Park Provinces, with their types of mountain structure, and their history in Cenozoic times. Chap. ii. describes the sedimentary groups of the Plateau Province, with a general section, and a notice of the localities where the several groups can be studied. Chap. iii., see INVERTEBRATE PALÆONTOLOGY, under **C. A. White.** Chap. iv. is on the geographic distribution of the formations, with sections. Chap. v., *Structural Geology*, describes the displacements, degradation with its methods, and sedimentation. W. W.

Pratt, W. H. Report on a Geological Examination of the section of the Bluffs recently exposed by the C., R. I. & P. R. R. *Proc. Davenp. Ac. Nat. Sci.* vol. i. pp. 96–99, pl. xxxii.
Describes a series consisting of clay, peat, and boulder-drift.

Prime, Fred., Jun. Report of Progress on the Brown Hematite Ore Ranges of Lehigh County, with a Description of the Mines lying between Emmaus, Alburtis, and Fogelsville. *Second Geological Survey of Pennsylvania.* Pp. xii, 74; 8 plates and map. 8vo. *Harrisburg.*

Quatrefages, Prof. A. de. [Shell-beds of Brazil.] *Bull. Soc. Géogr. Paris*, 6 sér. t. xi. p. 673.

A mass of these deposits containing a human skeleton has been given to the Paris Museum.

Raymond, R. W. The Spathic Iron Ores of the Hudson River. *Trans. Amer. Inst. Min. Eng.* vol. iv. pp. 339–343.

Draws attention to some developments recently made on the E. bank of the Hudson River in the mining of these ores. The rocks underlying the ore are slates, those above being either shale or limestone; weathered specimens assume the appearance of red hematite, though the interior is unaltered. These developments suggest that carbonates of iron may be found elsewhere in the older formations. Gives an analysis, and reports of blast-furnace managers. R. B. N.

Richter, —, and — Hübner. Berg- u. hüttenmännische Mittheilungen über Mexiko und einen Theil von Südamerika. [Mines and Smelting-works of Mexico and Parts of S. America.] *Zeitsch. Berg-, Hütt. Salinenw.* vol. xxiv. pp. 54–72, 223–234, 487–502.

Sketches of the physical and geological character of the principal gold and silver producing districts of Mexico, and Central and S. America, with statistics of the production of the mines. Part i. refers to Mexico, part ii. to Columbia, Ecuador, Peru, and Chili. H. B.

Rigby, Dr. Papers on Florida. *Cincinnati.*

Contains geological notes.

St. John, O. Notes on the Geology of North-eastern New Mexico. *Bull. U. S. Geol. Surv. Territories*, vol. ii. pp. 279–308, pls. 42–49.

The upper basin of the Canadian River is occupied by Cretaceous shales (series no. 4 of U. Missouri), passing to N.W., N., and E., under Lignitic (Eocene) beds, which extend to the W. and N. watersheds. To the S. and S.W. are metamorphic rocks; and at one point U. Carboniferous beds occur. Basaltic rocks traverse and overlie all the foregoing, metamorphosing them in places. The craters are visible; and saline springs remain. Sections are given of the Lignitic, which is conformable to the Cretaceous: the dip is N.E., 14 feet in a mile. Gold is obtained by washing and lode-mining in the S.W. of the district. The superficial deposits are described. W. H. D.

Schmidt, Dr. Adolf. Blei- und Zinck-Erz Lagerstätten in Südwest-Missouri. [Lead and Zinc Ore-deposits in S.W. Missouri.] *Heidelberg.*

Selwyn, A. R. C. Geological Survey of Canada. *Report of Progress for* 1874–75. Pp. 319. 8vo.

Contains the following Reports:—

Summary Report of Geological Investigations, pp. 1–23.

On the Country west of Lakes Manitoba and Winnipegosis, with notes on the Geology of Lake Winnipeg. By **Robert Bell.** Pp. 24–

56. Notes the occurrence of Lignite in the Swan River valley, where all the rocks are probably Cretaceous. Deals with the superficial geology of the N.W. territory, and notices the diminution of water therein in recent times.

On the Country between the Upper Assineboine River and Lakes Winnipegosis and Manitoba. By **J. W. Spencer.** Pp. 57–70. Contains observations on the Neozoic deposits, with 2 sections in parts of Swan River. A report is given by **G. M. Dawson** on microscopic examination of limestones of Swan River and marls of Thunder Hill. The Devonian deposits are considered with regard to distribution and fossils. The economic minerals include ironstone, lignite (assay given), peat and salt (analysis given).

On explorations in British Columbia. By **James Richardson.** Pp. 71–83. The geological features considered under the heads :—Superficial Deposits; Cascade Mountains and Vancouver Island Crystalline Series; The Coast from Douglas Channel to Wrangel in Alaska; The Nanaimo Coal Basin, with localities of coal or lignite.

Geological Observations in New Brunswick. By **L. W. Bailey** and **G. F. Matthew.** Pp. 84–89. The "pale argillite series" is Devonian. Describes the "Mascarene" series (U. Silurian).

Second Report on the Boring Operations with the Diamond Drill at Newcastle Bridge, Queen's Co., New Brunswick. By **R. W. Ells.** Pp. 90–96. Shows the beds passed through.

On the Iron Ore Deposits of Carleton County, New Brunswick. By **R. W. Ells.** Pp. 97–104, with a map showing distribution. Gives the average of 6 analyses of ore from Iron Ore Hill, by **John Mitchell.**

Explorations and Surveys in the Rear Portions of Frontenac and Lanark Counties, together with notes on some of the economic minerals of Ontario. By **H. G. Vennor.** Pp. 105–165, with a geologically shaded map. Reports on the map of N. Burgess, with a section. Notices the iron ore deposits, with an analysis of magnetite by **Mr. C. Hoffmann,** and a generalized section across Bedford. The structure of Lanark County is considered under 5 heads :—Mica Schist Group; Dolomite and Slate Group; Diorite and Hornblende-Schist Group; Crystalline Limestone and Hornblende-rock Group; Gneiss and Crystalline Limestone Group, with section. The geological horizon of Eozoon (below the apatite-bearing series) is considered. Gold, copper, galena, and plumbago are noticed.

On Explorations and Surveys in Cape Breton, Nova Scotia. By **C. Robb.** Pp. 166–266. 1. Carboniferous Limestone. 2. Millstone Grit, coal seams therein, with a description of their fossil plants by **Dr. Dawson.** 3. Coal Measures, including a list of plants with two new species (Dawson)—*Sigillaria Lorwayana* and *S. Syndensis* (woodcut); Subordinate Basins in the Coal Field (Cow Bay, Glace Bay, Sydney Harbour, and Bras d'Or); many sections given, &c.; tabular view of the equivalence of seams; Cape Dauphin district described (coloured geological map and sections). Economic minerals noticed. Surface geology (glacial action, erratics, the excavation of Bras d'Or Lake, &c.).

There are analyses of coals and iron-ore by **Prof. Chapman** and **Prof. How.** A geological map of the Sydney Coalfield by the author and **Mr. Hugh Fletcher**, and sections of the measures are given.

On the History and Statistics of the Trade and Manufacture of Canadian Salt. By **J. L. Smith.** Pp. 267–300. Records borings.

Notes on a Few Canadian Minerals and Rocks. By **B. J. Harrington.** Pp. 301–312. Many analyses given.

Chemical Contributions to the Geology of Canada. By **C. Hoffmann.** Pp. 313–319. Gives analyses of minerals and mineral waters. R. B. N.

Selwyn, A. R. C. Huronian of Canada. *Amer. Journ.* ser. 3, vol. xii. p. 461.

Refers to Mr. Bradley's paper.

Selwyn, A. R. C., and others. Descriptive Catalogue of a collection of the Economic Minerals of Canada, and Notes on a Stratigraphical Collection of Rocks. Pp. 152; 2 woodcuts. 8vo. *Montreal.*

Arranged under the following heads:—i. Metals and their Ores; ii. Materials used in the production of Heat and Light; iii. Minerals applicable to certain Chemical Manufactures, and their Products; iv. Mineral Manures; v. Mineral Pigments and Detergents; vi. Salt, Brines, and Mineral Waters; vii. Materials applicable to Common and Decorative Construction; viii. Refractory materials, Pottery-Clays and Pottery; ix. Materials for Grinding and Polishing; x. Minerals applicable to the Fine Arts and to Jewellery; xi. Miscellaneous. G. A. L.

Shaler, Prof. N. S. The Harvard Summer School of Geology. *Amer. Nat.* vol. x. pp. 29–31.

Records the work of a class, for the practical teaching of geology and palæontology, in the summer of 1876, at Cumberland Gap, Kentucky.

——. On the Antiquity of the Caverns and Cavern life of the Ohio Valley. *Mem. Geol. Surv. Kentucky*, vol. i. pp. 334.

For other papers, see **Allen** and **Shaler**, *post* under PALÆONTOLOGY.

Simpson, Capt. J. H. Report of Explorations across the Great Basin of the Territory of Utah. Pp. 518, map. 4to. *Washington.*

Appendix J.—Report of the Country between Fort Leavenworth and Sierra Nevada, near Carston Valley, by **Henry Engelmann,** pp. 243–336. Appendix J.—Report on the Palæontological Collections of the Expedition, by **T. B. Meek,** pp. 337–374, with 5 plates of fossils. Appendix N.—Resources of the Territory of Utah, by **Dr. Garland Hunt,** pp. 449–456. Appendix Q.—Journal of **E. M. Kern,** of an Exploration of Humboldt River, Carson Lake, and Owen's River and Lake, in 1845, pp. 475–486. G. A. L.

Smith, Dr. Eugene A. Geological Survey of Alabama. Report of progress for 1875. 8vo. *Montgomery, Alabama.* Pp. 220.

General Outline of the Geological Formations (Silurian, Devonian, Carboniferous), pp. 9–12. General Description of the Geological Formations occurring in the region examined, 13–28. Historical

Account of Coal Mining Operations in Alabama since 1863, by **T. H. Aldrich** (Cahaba, Coosa, and Warrior Fields), 28–45. Geological Features of the Fields and Character of the Coals (Alabama Coal and Iron, by **R. P. Rothwell** [reprint]. Analyses of coals), 45–65. Production, 65, 66. Records of 4 borings, 66–74. Partial List of Coal-Plants, and Geological Station marked by the Specimens, by **Prof. Lesquereux**, 75–82. Details of Bibb, Shelby, Talladega, Calhoun, and Coosa Counties (sections; many analyses of iron-ores, limestones, and copper-ores; notes of minerals), 83–190. Chemical Report, with analyses, 190–198. Appendix, Description of the Eastern side of the Cahaba Coal Field, by **M. Tuomey** (1855, ? reprint. Estimate of yield, analyses of coals), 205–212. W. W.

Stevenson, J. J. Report of Progress in the Greene and Washington District of the Bituminous Coal-fields of Western Pennsylvania. *Second Geological Survey of Pennsylvania.* Pp. x, 420, plates (2 maps, 3 sections). 8vo. *Harrisburg.*

Part i., Introduction, pp. 1–22, describes the physical features and surface Geology. Part ii., Systematic Geology, pp. 23–89, describes the stratified rocks (Coal Measures). Part iii., Geology by Townships, pp. 90–349, gives details under about 70 heads. Part iv., Tables of Depth, pp. 350–375, gives the calculated depths of coals at many places. Part v., Economic Geology, pp. 376–397, gives notes and analyses of coals, iron-ores, limestone, petroleum, &c. W. W.

Tiffany, A. S. Discovery of Human Remains in a Shell-bed on Rock Island. *Proc. Davenp. Ac. Nat. Sci.* vol. i. p. 42.

Note of discovery in stratified shelly sand.

Wallace, Charles M. On Flint-implements from the Stratified Drift of the vicinity of Richmond, Virginia. *Amer. Journ.* ser. 3, vol. xi. pp. 195–199.

Gives 2 sections of deposits (soil, brick-earth, clay, gravel, and sand) near the James River, whence the implements were derived.

Warren, G. K. Report on the Transportation route along the Wisconsin and Fox Rivers, in the State of Wisconsin between the Mississippi River and Lake Michigan. Pp. 114, maps. *Senate Ex. Document*, no. 28, 44th Congr. *Washington.*

Describes the physical geography, noticing the oscillations which determined it, and the sandbars of the Wisconsin.

Warren, Major. Report on the Minnesota River. In the *Annual Report of the Chief Engineers to the Secretary of War for the year* 1875. Map.

Much geological information, including a map showing the Mississippi when its head was Lake Winnipeg.

Wiener, Prof. C. [Notes on Shell-heaps on the Coast of Peru.] *Mitth. k.-k. geogr. Ges.* pp. 486–489. See *Geol. Mag.* 1877, p. 28.

The age of these *sambaquis*, or ancient kitchen-middens, is in pro-

portion to their distance from the coast, the upheaval of the coast being a fact. In those furthest from the coast a *Corbula*, not now inhabiting the neighbouring shore, has been found. G. A. L.

Williams, S. G. Notes on the Geology of some localities near Cañon City, Fremont County, Colorado. *Bull. U.S. Geol. Surv. Territories*, ser. 2, no. 5, pp. 249–251.

Gives a section in Oil Creek (tributary to Arkansas R.) in Cretaceous, Jurassic, Triassic?, and Carboniferous? beds. Oil-springs occur 200 feet above the base of the Jurassic. A section in Coal and Oak Creeks shows 9 coal seams, with a total thickness of 26 ft. 8 in. of coal, besides 3 thin seams. The coal is Tertiary, and dips W. 7°. W. H. D.

Winchell, Prof. A. Supposed Agency of Ice-Floes in the Champlain Period. *Amer. Journ.* ser. 3, vol. xi. pp. 225–228.

Refers to huge tabular masses of limestone in Michigan in the midst of semistratified sands (Drift). Connects these masses with ice-floes formed during the gradual change from "a geologic winter to a geologic spring" towards the close of the Glacial Epoch. G. A. L.

Winchell, Prof. N. H. On the Parallelism of Devonian Outcrops in Michigan and Ohio. *Proc. Amer. Assoc.* for 1875, pp. 57–59.

Winchell, Prof. N. H., and W. Harrington. Geological and Natural History Survey of Minnesota. Fourth Annual Report for 1875. Pp. 162, coloured geological maps and illustrations. 8vo. *St. Paul.*

Fillmore, Olmstead, Dodge, and Steele Counties are reported on, and geological maps of them given.

Wolf, Th. [Geology of Ecuador.] *Zeitsch. deutsch. geol. Gesell.* Bd. xxviii. Heft 2, pp. 391–393.

Mentions preliminary results of a survey in Ecuador. Province Loja is richest in minerals; it consists of schists with gold-bearing quartz-veins enclosing a Tertiary basin in which are beds with dicotyledonous plants. N. of Loja is a granite-district with numerous greenstone dykes. On the boundary between Ecuador and Peru is a great variety of igneous rocks, greenstone veins containing gold. At Zaruma are abundant gold-mines, all the quartz-veins here being auriferous. Copper, lead, silver, and zinc occur. At Malacatos the veins contain cerasine. E. B. T.

Wrigley, Henry E. Special Report on the Petroleum of Pennsylvania, its Production, Transportation, Manufacture, and Statistics. Maps and illustrations. *Second Geological Survey of Pennsylvania*, pp. viii, 122. 8vo. *Harrisburg.*

Wulsten, Carl. The Silver Region of the Sierra Mojada. *Denver.*

Report of the Department of Mines, Nova Scotia, for the year 1875. Pp. vi, 106. *Halifax.*

5. *ASIA.*

Abich, H. Über Paraffin enthaltende Mineralstoffe auf der apscheronschen Halbinsel. [Paraffin-minerals of Apscheron (Caspian Sea).] *Bull. Ac. Imp. Sci. St. Pétersburg*, t. xxii. pp. 493–509.

Anderson, Dr. J. Mandalay to Momien. 8vo. *London.*
Contains notices of the occurrence of coal, sulphur, galena, orpiment, and other minerals, and of their being worked, in Yunnan.

Anon. (An Officer late of the Ceylon Rifles.) Ceylon: A General Description of the Island, Historical, Physical, and Statistical. 2 vols. 8vo. *London.*
Vol. i. chaps. i.–v., Physical Geography. Notices probable submergence of part of the island; geology of Sumatra, S. India, and Ceylon compared; general character of the geology; gradual rise of the island; mountain system; recent formations; volcanic systems; gneiss; dolerite and laterite; salt; coral reefs; minerals. W. W.

Blanford, W. T. On the Geology of Sind. *Rec. Geol. Surv. Ind.* vol. ix. pp. 8–22.
Classifies the rocks of Sind thus:—*Manchar* or Sevalik; *Gáj* or Supra-Nummulitic; *Nari* or U. Nummulitic; *Khirthar* or L. Nummulitic; *Ranikot* or Infra-Nummulitic.
The Ranikot group consists of variegated sandstones and clays with gypsum; the fossils are chiefly dicotyledonous leaves; but some calcareous bands yielded fossils having Cretaceous affinities; at present the group is ranked as doubtfully L. Eocene.
The Khirthar group is usually a great thickness of limestone, abounding in Nummulites and other Foraminifera. Its age is the same as that of the Nummulitic limestone of S. Europe, or typically Eocene.
The Nari group has, for a few hundred feet at bottom, limestone interbedded with sandstone and shale. These lower beds are characterized by *Nummulites garansensis*, *N. sublævigatus*, and *Orbitoides Fortisi*. They rest conformably on the preceding beds, but show a complete break in mineral character and fossils. A great thickness of brown sandstone without fossils succeeds. The Nari beds are counted as U. Eocene or L. Miocene, or perhaps both.
The Gáj group (up to 1000 feet thick) has, among sandstones and shales, fossiliferous limestones with a rich marine fauna. Echinodermata and corals are abundant, as well as Lamellibranchiata. No Nummulites have been observed. The author concludes that the Gáj beds are Miocene, or possibly Pliocene. The uppermost beds may be estuarine, as they contain an *Arca* allied to a typical living estuarine shell.

The Manchar group consists of some 5000 feet of clay, sandstone, and conglomerate; it is unconformable to the last; its origin was probably fluviatile and subaerial. It is the equivalent of the Sevalik and Nahun beds of the Punjab; and, since it cannot itself be older than Pliocene, its determination tends to throw forward the last-named to a later age than has hitherto been assigned. The Manchar beds are tilted up so as to form part of the Khirthar range.

A basaltic lava-flow has been found interstratified with the Ranikot group.

Lists of fossils are given. F. D.

Blanford, W. T. Note on the geological age of certain groups comprised in the Gondwána series of India, and on the evidence they afford of distinct Zoological and Botanical Terrestrial Regions in ancient epochs. *Rec. Geol. Surv. Ind.* vol. ix. pp. 79–85.

Criticises the conclusions of Feistmantel (see p. 147) as to the age of the subdivisions of the Gondwána series. Points out that the Kach beds, though containing a L. Oolitic flora, rest upon marine strata, with Portlandian and Tithonian Cephalopoda; considers that the Damúda beds show as much affinity with the Australian Carboniferous rocks as with the Trias of Europe; and concludes that the terrestrial faunas and floras, in Palæozoic and Mesozoic times, varied far more than the fauna of the seas, and hence the evidence of fossil plants, in determining homotaxis, should be received with caution. F. D.

——. On the Physical Geography of the Great Indian Desert, with especial reference to the former existence of the Sea in the Indus Valley; and on the Origin and Mode of Formation of the Sand-hills. *Journ. As. Soc. Bengal*, vol. xlv. pt. ii. pp. 86–103. Noticed in *Geol. Mag.* dec. ii. vol. iii. pp. 508–511.

Describes in detail the distribution of sand hills in Eastern Sind and towards Bikanír and Jodhpúr. Infers from this, and from the existence of low-level salt pools inhabited by *Potamides Layardi*, the former existence of an inlet of the sea, which extended over the Ran of Kachh up to the E. edge of the Indus alluvium, and perhaps over the whole alluvial area of the Indus valley, as well as over part of the basin of the Lúni. Jaysalmír and Bálnúr formed either an island or a promontory. The sand of the desert was derived from the old coast-line, and was transported into the interior by the S.W. wind. The cause of the particular direction of the sand hills is discussed; and an account of the botany and zoology of the desert, in its previous state, is given. F. D.

——. Eastern Persia. Vol. II. The Zoology and Geology. [Geology, pp. 439–506.] *London.* 8vo.

Part I. reviews the writings of previous observers, sketches the physical geography of Persia, and enumerates the rock-formations thus:—Metamorphic rocks, including granite; Palæozoic rocks (De-

vonian and Carboniferous); Liassic and Jurassic rocks, chiefly the plant-bearing beds of the Elburz mountains; Cretaceous rocks, occupying a great area in S.W. Persia—a pale massive limestone, often abounding in *Hippurites*, being the most conspicuous rock; of Cretaceous age also are volcanic rocks, chiefly dolerites and ash beds, which occur in several parts. The Tertiary rocks are divided into the Nummulitic series, gypsiferous series, and Makrán group. Under the head of Quaternary or Recent are included all the surface-accumulations in the plains and valleys and on the hill-slopes, as well as the raised beaches. Lastly, there are volcanic rocks which have been produced in recent geological times. Part II. consists of a detailed account of the rocks seen by the author in his journey, which extended from Gwádar, on the Arabian Sea, to Bam, Karmán, Shiráz, Isfahán, Tehrán, and Resht, and included a visit to the Elburz mountains. F. D.

Burton, Capt. R. F. The Nizam Diamond.—The Diamond in India. *Quart. Journ. Sci.* n. ser. vol. vi. pp. 351–360.

A description of the Nizam diamond, and an account of the diamond mines of India, partly drawn from the writings of Briggs, Carter, Hislop, and Hunter. F. D.

David, Abbé Armand. Second voyage d'exploration dans l'Ouest de la Chine, 1868 à 1870. [Second Exploring Journey in W. China.] *Bull. Soc. Géogr. Paris*, 6 sér. t. xi. pp. 24–52, 156–183, 278–303.

The scientific missionary's diary-notes are put into shape by **M. Jules Legros**. The nature of the soil, the lie of the rocks, with other geological notes taken day by day during the exploration, are noticed. G. A. L.

Desgodins, Abbé —. Notes géologiques sur la route de Yerkalo à Patang. [Geology of the Country between Yerkalo and Patang.] *Bull. Soc. Géogr. Paris*, 6 sér. t. xii. pp. 492–508.

Duncan, Prof. P. M. An Abstract of the Geology of India. Ed. 2. Pp. 62. Fol. *London.*

See notice of Ed. 1 in the GEOLOGICAL RECORD for 1875, p. 136.

Feistmantel, O. Notes on the age of some fossil floras of India. *Rec. Geol. Surv. Ind.* vol. ix. pp. 28–42, 63–79, 115–144. See also *Nature*, vol. xv. p. 99, and *Geol. Mag.* dec. ii. vol. iii. pp. 481–491.

The rocks hitherto spoken of as the "plant-bearing series" of India are here definitely named the Gondwána series or system. An examination of the plants in it indicates the following horizons:—1. Kach; 2. Rájmahal; 3. Panchet; 4. Damúda; 5. Talchír. Nos. 1 and 2 are spoken of as Upper, and Nos. 3, 4, and 5 as Lower Gondwána. A comparison of the species of Filices, Cycadeæ, and Coniferæ with those of Europe shows that the Kach rocks are Oolitic, and probably L. Oolitic;

while other species of the same groups, with Equisetaceæ in addition, mark the Rájmahal horizon as Liassic. The Panchet beds, before considered Triassic, are determined as Keuper. The Damúda beds, in spite of some forms being found also in the Palæozoic coal-strata of Australia, are thought, from the majority, to be L. Triassic. The Talchír beds are but the lower part of the Damúda formation, or a lower horizon of L. Triassic. The following new species are described:—*Schizoneura Gondwanensis*, *Neuropteris valida*, *Actinopteris Bengalensis*, *Gangamopteris cyclopteroides*.

The last part meets Mr. Blanford's arguments (see p. 146) by denying that it is clearly proved by molluscan remains that the Kach beds are U. Oolitic, the 4 Portlandian Cephalopoda being insufficient in face of other palæontological facts. With regard to the L. Gondwána groups, the author lays stress on the passage between them and the U. Gondwána groups, and maintains, by means of a more detailed account of the plants, the Mesozoic and even the Triassic character of the Damúda flora. As to the analogy of the Damúda with the Australian beds, the only likeness is to the "upper coal-measures" of Australia, and there is no proof of the Palæozoic age of these; on the contrary, he would count them as Triassic—only the L. Coal Measures of that country and rocks below them being Carboniferous. Then follows a description of the flora of the Jabalpúr group in S. Rewah and Satpúra, which is shown to be of the same age as the Kach rocks and of the L. Oolite of Yorkshire. The following new species are described:—*Macrotæniopteris Feddeni*, *Gangamopteris Hughesi*, *Sagenopteris Stoliczkana*, *Glossozamites Stoliczkanus*. F. D.

Feistmantel, O. On the Gondwána Series of India as a probable representative of the Juro-Triassic Epoch in Europe. *Geol. Mag.* dec. ii. vol. iii. pp. 481–491.

See above notice.

Foote, R. B. The Geological Features of the South Mahratta Country and adjacent Districts. *Mem. Geol. Surv. Ind.* vol. xii. pp. 268, map and plates.

A synopsis of previous writings on the subject is given. The older metamorphic rocks underlie all; they vary in character, generally in bands, which can be traced for some miles; the prevalent strike is N.W. by N. There is granitoid gneiss, hornblendic or micaceous, and more or less porphyritic; the bedding is sometimes obliterated, sometimes distinct; in one case diagonal foliation or false bedding was observed in the gneiss. Of schistose rocks there are five varieties, including hæmatite schist; in this last there are ferruginous folia which are sometimes entirely composed of hæmatite, but sometimes consist merely of grains of it combined with siliceous particles; this may pass into an iron-stained quartzite. Crystalline limestone occurs, though rarely, as well as dolomite. These metamorphic rocks are traversed by dykes of diorite, by granitic veins, and by quartz reefs. F. D.

Next upon these rocks rests the *Kaládgi series*, in which no fossils have been found. It consists of quartzites, sandstones, cherty breccias, limestone, and clay, of a total thickness of 10,000 to 15,000 ft. Their local variations, as well as their relation to the physical features of the country, are described in detail. Where much disturbed they have acquired a submetamorphic character. No exact correlation of these rocks with any distant ones is as yet possible; they much resemble the Kadapá series further east. In the E. part of the area rocks are found named "Bhima series." They are not seen in contact with the preceding, but, from lithological differences and the analogy of other districts, appear to be newer, and to correspond to the Karnul or L. Vindhyan series. Then follow deposits named "Infra-trappean," some of which may represent the Lameta beds of Central India. They are soft marls or clayey grits of small thickness and extent, probably of lacustrine origin.

Resting either on the last-named beds, or on the Kaládgi or the Bhimá series, is the great Deccan Trap formation, an accumulation of lava-flows to a depth of 2000 to 2500 feet; the lower flows are mostly basaltic, the middle alternately basaltic and amygdaloidal, the upper chiefly basaltic. The beds are very nearly horizontal. "Inter-trappean" beds occur low down in the series—thin sedimentary beds, proved by fossils (the same as are found in inter-trappean beds near Nágpúr, &c.) to be of freshwater-lake origin, showing that the traps of both regions belong to the same period.

The higher ridges and peaks are capped by what is named "iron-clay," a substance of the character of laterite, supposed to result from the decomposition of the topmost trap-bed; the greatest observed thickness was 50 to 70 feet. Resting on the denuded surface of Deccan trap on the Konkan coast are the Ratnágiri plant beds. Later Tertiary and recent deposits are also described.

A chapter on economic geology records the use of many varieties of building-stone, and shows by drawings the native method of smelting iron from the red and the brown hæmatite and from the Konkan laterite. Salt and saltpetre are collected by evaporation from the waters of streams, and in one case from brine raised from wells. F. D.

Hochstetter, F. von. Asien, seine Zukunftsbahnen und seine Kohlenschätze. [Asia, its future lines of traffic and its coal resources.] Pp. 188, map. 8vo. *Vienna.*

Hughes, T. W. H. On the relations of the fossiliferous strata at Maléri and Kótá, near Sironcha, Central Provinces. *Rec. Geol. Surv. Ind.* vol. ix. p. 86.

By recently discovered fossil-evidence these beds may be ranked not younger than the Lias.

Lydekker, R. Notes on the Fossil Mammalian Faunæ of India and Burma. *Rec. Geol. Surv. Ind.* vol. ix. pp. 86–106.

Gives a classified list of the beds in which mammalian remains have been found, from the Subáthú (Miocene) upwards, and a list of the Mammalia from each. Of 46 Miocene and Pliocene genera, 25 are extinct, and of the remainder 17 are living in or near India; 26 genera are common to the Tertiaries of India and of Europe; 8 are common to the Indian Tertiary fauna and the living fauna of Europe; while 12 of the Indian Tertiary genera are living in Africa; 14 genera are peculiar to the Indian Tertiaries. These facts are taken to confirm H. F. Blanford's hypothesis of a land-connexion (Indo-oceanic) between India and Africa, the connexion with Europe in Middle Tertiary times being through N. Africa. The author thinks that the latter means of communication was broken before the former. The age of the Siwaliks is discussed, and the conclusion is that it is Pliocene. An appendix contains descriptions of new or little-known Mammalia. A new genus and species are made (*Vishnutherium Travadivum*, near *Camelopardus* and *Sivatherium*) for a part of a mandible from Burma. F. D.

Lydekker, R. Notes on the Geology of the Pir Panjál and the neighbouring districts. *Rec. Geol. Surv. Ind.* vol. ix. pp. 155–162, map and section.

The Tertiary rocks of the outer ranges end against the older rocks, with a dip towards the mountains. This is not due to the former having been deposited against a cliff, but it is a faulted junction. The older rocks are limestone and shale (Silurian), and on these metamorphic slates and quartzites (Cambrian); in some places an amygdaloidal rock (which seems not to be trappean) occurs with the latter series, and in places a porphyritic gneiss appears. The dipping of the limestone and shale beneath the metamorphic rocks is only apparent, being due to inversion. A sketch section through the Panjál range at Banihál is given showing how this might be. Dr. Stoliczka considered rocks in Kashmir similar to the amygdaloid to be metamorphic; and these are contemporaneous with the great mass of rocks of the Pir Panjál. F. D.

Mallett, F. R. On the Coal-fields of the Nágá Hills bordering the Lakhimpur and Sibságur Districts, Assam. *Mem. Geol. Surv. Ind.* vol. xii. pp. 95; 3 maps.

The lowest beds seen are named the "Disang Group;" they consist of some thousands of feet of sandstone and shale, without coal. Above them comes the coal-bearing group, of which about 2000 feet is seen in one place; it consists of shale, sandstone, coal, a few calcareous layers, and some clay ironstone. Detailed sections are given of several hundred feet in thickness. The coal is in many beds, chiefly from 6 inches to 3 feet thick; but there are seams even 70 feet thick. The age is perhaps the same as that of the lignite-bearing nummulitic strata of the Panjab. Next above comes the Tipám group; estimated thickness 7000 to 9000 feet. Thick-bedded felspathic sandstones make the great bulk. Above is the Dihing group, several hundred feet thick, with some "coal-conglomerate" near its base, made up of pebbles of coal with a

few of sandstone, &c.; above this are clays and conglomerates that enclose pebbles of the sandstone (apparently) of the Disang group. These two groups, the Tipám and Dihing, belong to the great Sub-Himalayan series, which stretches along the base of the mountains. Five small coal-fields are described in detail, and an estimate is made of the amount of coal available in each at a moderate depth; at least 36,000,000 tons could be brought to market; and there is great probability of much more. Many analyses of the coal are given; the average amount of fixed carbon is 60 p. c., of ash 3·8, comparing favourably with the coal of Ráníganj: most of the coal is caking; some of it is of a hard character, and alters little on exposure to the weather. Petroleum has been found in 17 places, all on or close to the outcrop of the coal-bearing group. Iron-ore, in the forms of clay-ironstone and impure limonite, was extensively worked by the Assamese; but the industry is now extinct. Though there is enough of the ore to keep any number of native furnaces going, it is doubtful whether a blast-furnace could be fed from any one locality. Some alum-shales are noticed. Limestone is very scarce. The account is prefaced by a précis of all the information regarding coal and petroleum in Assam, and a list of all papers bearing on the geology of that country. F. D.

Marchesetti, C. D. On a Pre-historic Monument of the Western Coast of India. *Journ. Bombay Branch R. As. Soc.* vol. xii. pp. 215–218.

Near the village of Cotandem, 48 miles from Goa, is a petrified forest extending over a surface of several miles. The stems of the trees lie on granite, and are imbedded in laterite. Of the silicified trees, most are monocotyledons, but some are conifers. Many of the trunks bear traces of the instruments employed to cut them down. F. D.

Medlicott, H. B. Note upon the Sub-Himalayan series in the Jamu (Jummoo) Hills. *Rec. Geol. Surv. Ind.* vol. ix. pp. 49–57.

A comparison of the subdivisions of the Tertiary Sub-Himalayan beds of the neighbourhood of the Sutlej with those of the Jummoo country and of the tract beyond the Jhelum. The lowest beds are inliers of limestone conformably overlain by Subáthú beds. The Náhan beds are recognized and traced through the country, and the question of their relation to the formations below and above is discussed. An upper division of the Siwalik group is proposed for the conglomeratic zone and its equivalents; and it is remarked that the Siwalik conglomerates occur near the great Himalayan rivers. High-level river-shingle within the hills, 400 to 500 feet above the present watercourses, is noted. F. D.

Mellera, V. [Geological Sketch of Ilimsk and Yuknov.] 8vo. *St. Petersburg.* (In Russian.)

Merrill, S. Palestine Explorations. *Athenæum*, July to Dec. pp. 84, 85, 117.

Notes on physical geography, &c.

Montrousier, Abbé —. [Geology of Southern Tonquin.] *Bull. Soc. Géogr. Paris*, 6 sér. t. xii. p. 659.
Letter containing a few notes.

Muschketoff, J. [Solfataras of Turkestan.] *N. Jahrb.* Heft v. pp. 516, 517.
Shows from personal observation that the so-called volcanic district of Bisch Balig does not contain true solfataras or other evidence of volcanic action. The observed phenomena are due to combustion of coal-beds of Jurassic age. Bai-schan has not been visited by any European, and may be, as reported, volcanic; but analogy suggests that it is not. F. W. R.

Nordenskjöld, Prof. A. E. Voyage dans la Sibérie septentrionale; lettre adressée à M. Daubrée. [Exploration in N. Siberia.] *Bull. Soc. Géogr. Paris*, 6 sér. t. xii. pp. 78–97.
Contains scattered geological notes, and details respecting mammoth-remains.

——. On the Jenisei. *Nature*, vol. xiii. p. 275, note.
Mentions some rich coal-seams cropping out on the E. bank near Krasnoiarsk. Coal occurs not far from Dudino, nearer the mouth.

Oldham, T. Annual Report of the Geological Survey of India for 1875. *Rec. Geol. Surv. Ind.* vol. ix. pp. 1–9.
A sketch on the progress of the Survey.

Oxenham, E. L. On the Inundations of the Yang-tse-Kiang. *Journ. R. Geogr. Soc.* vol. xlv. pp. 170–184, map (not geological).
Describes the basin of that river and its floods, and notes the filling up of lakes and the raising of the plains by sediment left. In some seasons they are heightened by 2 or 3 inches of earth. F. D.

Prejevalsky, Lt.-Col. N. Mongolia, the Tangut Country, and the Solitudes of Northern Tibet. . . . . (Translated.) 2 vols. 8vo. *London.*
Some remarks of a geological nature scattered throughout.

Radan, R. Les Routes de l'Avenir à travers l'Asie [et les gisements houillers de la Chine]. [Future Routes across Asia, and the Coal-deposits of China.] *Rev. Deux Mondes*, t. xvi. pp. 386–421.

Shaw, R. B. A Prince of Kâshghar on the Geography of Eastern Turkestan. *Proc. R. Geogr. Soc.* vol. xx. pp. 482–492.
The distribution of the water-courses over the Kâshghar and Yârkand country is accounted for. The slope consists of a series of alluvial fans on a large scale, with a gentle inclination, over which the mountain-streams flow in radial directions. F. D.

Wojeikoff, —. [A Russian Account of Scientific Progress in India.] *Iswestija Imp. Ross. Geogr. Obw.* no. 3. Noticed in *Nature*, no. 411, p. 425 (1877).

Treats of the "black earth," which is taken to be the result of herbaceous steppe-vegetation.

Wood, H. Notes on the Lower Amú-darya, Syr-darya, and Lake Aral, in 1874. *Journ. R. Geogr. Soc.* vol. xlv. pp. 367–413, map (not geological).

Deals with the present and former courses of the Amú or Oxus river. As late as 75 B.C. traffic passed down it to the Caspian; after that it flowed into the Aral; again (before the 14th century) it flowed into the Caspian, and by the end of the 16th century reached the Aral by the S.W. corner. The author thinks these changes due to diversion of water for irrigation, the volume left in the natural channel being insufficient to keep it clear of silt, while the surplus water from the irrigation gradually enlarges the channel by which it is allowed to flow away. There are a few notices of ferruginous sandstone and fossiliferous beds in the low hills about the Amú delta. The Shaikjaili Hills, 3000 feet high, are of metamorphic rocks. Two whirlpools, at the junction of several channels of the Amú, one 60 ft., the other 120 ft. deep, are considered to be the craters of extinct mud-volcanos.

With regard to the Syr-darya, it is suggested that its deflection to the N. from a little below Khojend is due to causes similar to those which made the Amú vary its course. Many observations on the depth and volume of water contained in Lake Aral are given; and the hypothesis is put forward that, at a former period, being at a much higher level than now, it communicated with the Caspian both from its N.W. and S.W. corners. F. D.

——. The shores of Lake Aral. *London.* (See above.)

——. On the former physical aspects of the Caspian. *Geogr. Mag.* vol. iii. pp. 8–11, 34–38.

It is calculated that the Volga brings about five sevenths of the whole supply of water to the Caspian; a diversion of that river to the Black Sea would reduce the Caspian to two small lakes more or less surrounded by marshes. This is its condition as described in ancient writings. At Bakû there are ruins some 50 ft. below the present surface; and tradition points in the same direction. The Volga, in great probability, flowed into the Palus Mœotis; the Black Sea must have been much less salt than now, and a large body of water must have flowed out by the Bosphorus. F. D.

——. Geological exploration in the Amu Darya District. *Geogr. Mag.* vol. iii. pp. 22, 23.

Combats some of Barbot de Marny's conclusions as to the late extension of water over the Aralo-Caspian area, and as to the origin of

the sandhills, put down by that author to the disintegration of friable sandstones. F. D.

Wood, H. Former Physical aspects of the Caspian. *Geogr. Mag.* vol. iii. pp. 336, 337.
Reply to Dr. Worikof (see below).

Worikof, A. Former Physical aspects of the Caspian. *Geogr. Mag.* vol. iii. pp. 224, 225.
Combats Major Wood's view (see above) that the Volga, in comparatively recent times, flowed into the sea of Azov.

6. *AFRICA.*

Anon. La Vérité sur les minerais de fer en Algérie. [The Truth respecting the Iron Ores of Algeria.] *Echo des Mines*, t. i. nos. 8, 9, 10, pp. 81, 129–131, &c.

Describes the modes of occurrence of the ores, and gives a list of all the iron-mines, whether worked or not. Discusses their commercial value, and concludes against the probability of a future extension of iron-production in the colony, except as regards the magnetite found chiefly at Mokta el Hadid, &c. associated with the older rocks. G. A. L.

——. The Proposed Submersion of North Africa by the Mediterranean Sea. *Journ. Soc. Arts*, vol. xxiv. no. 1237, pp. 883, 884.

Apparently a notice of a Report by Vice-Consul Dupuis. The project is based on the fact of the occurrence of lakes in the line of the great depressions, and the presumption that these lakes are the residue of an inland sea, which disappeared through the formation of an isthmus, cutting it off from the Mediterranean. Recent surveys, however, reject the idea of former connexion with that sea, but indorse that of the region having been under water. The isthmus is not a mere mass of sand, but is chiefly composed of alternations of quartz and freestone over Chalk. The disappearance of the water is thought to be owing to the encroachment of the desert. W. W.

——. Sokotra. *Geogr. Mag.* vol. iii. pp. 119–124.

The island consists of limestone pierced by granite, diorite, and other igneous rocks, the granite making mountains which rise to 24,656 ft.

Barth, Baron H. de. Exploracão geologica na Africa Portugueza. 1.... provincia de Angola. [Geological Exploration of Portuguese Africa, Angola.] *Ann. Com. Centr. Geogr.* no. 1, pp. 35–37.

Coquand, H. Sur les grès rouge de la Nubie. [Red Sandstones of Nubia.] *Bull. Soc. Géol. France*, 3 sér. t. iv. pp. 159, 160.

Currey, John B. The Diamond Fields of Griqualand, and their probable Influence on the Native Races of South Africa. *Journ. Soc. Arts*, vol. xxiv. no. 1217, pp. 372–381.

Notices the history of the discovery and the methods of working.

Czyszkowski, Stephen. Coup d'Œil Général sur la Nature & le Gisement des Minerais de Fer en Algérie & Considérations Générales sur les Gisements métallifères. Algérie—Pyrénées—Corbières—Montagne Noire—Région de Huelva (Espagne)—Cevennes (Zone d'Alais). Essai de Classification des Gites Minéraux. Thal-

wegs Métallifères. [Iron-ores of Algeria and other Metalliferous Deposits.] *Bull. Soc. Sci. Litt. Alais.* Pp. 74; 4 plates.

Chaps. i. General sketch of Algerian geology (Crystalline rocks, Lias, M. and U. Oolite, Cretaceous and Tertiary beds, eruptive rocks; ii. Iron-bearing rocks of Algeria (11 analyses); iii. Local character, influence of position of rocks, and origin of metallic ores in France and Spain; iv. Classification of mineral deposits. W. H. D.

Daubrée, Prof. [Coal in the Gaboon.] *Bull. Soc. Géogr. Paris*, 6 sér. t. xi. pp. 446, 447.

Note of discovery of thin seams of lignite in beds of sandstone at Boungi, near the shore.

Duveyrier, Henri. Itinéraires de Methlîli à Hâssi Berghâoui et d'el-Golêa'a à Methlîli, d'après un journal de voyage en 1859. [Notes from Methlîli to Hâssi Berghâoui and from El-Golêa'a to Methlîli.] *Bull. Soc. Géogr. Paris*, 6 sér. t. xi. pp. 577–611, map (not geological).

The geological features of the region passed over are described.

Erskine, St. V. Journey to Umzilás, South-east Africa, in 1871–1872. *Proc. R. Geogr. Soc.* vol. xx. pp. 48–128.

Contains a few geological notes.

Goujon, A. Takouch, ses roches et ses pierres fines. [Takouch, its Rocks and Precious Stones.] *Bull. Ac. Hippone*, no. 12, pp. 42–56.

Jones, Prof. T. R. Visit to the Museum of the Geological Society, Burlington House; Inspection of the South-African Collection. *Proc. Geol. Assoc.* vol. iv. no. 8, pp. 483–490.

Gives a summary of S.-African geology (with references), and a list of Reptilia from the Karoo beds.

Jus, —. Résumé historique des sondages artésiens dans la province de Constantine, de 1856 à 1875. [Artesian Wells of Constantine, Algeria.] Pamphlet.

La Chatellier, H. [Geology of the Chotts region, N. Africa.] *Bull. Soc. Géogr. Paris*, 6 sér. t. xii. pp. 211, 212.

The salt-deposits are not only found in the areas now below sea-level, but up to 100 metres above it. The sands are littoral in character; and a *Cardium* is the only organic remain, a brackish species different from those inhabiting the Mediterranean. For these reasons (with others) the writer denies that the sea of the Chotts existed in historical times. G. A. L.

Largeau, V. [Notes on the geology, etc. of the Sahara.] Abstract. *Bull. Soc. Géogr. Paris*, 6 sér. t. xii. p. 439.

Maw, George. *Bos primigenius* in Algeria. *Geol. Mag.* dec. ii. vol. iii. p. 48.
Letter announcing discovery.

Nachtigal, Dr. Gust. Voyage dans l'Afrique centrale. [Travels in Central Africa, 1869–1874.] *Bull. Soc. Géogr. Paris*, 6 sér. t. xi. pp. 129–155, 255–277, map (not geological).
The Tibesti mountains consist in part of granite capped with sandstone; and their summit is a vast crater (p. 133). The soil of the Somraï is clayey (p. 151); and so is that of the Fettri country (p. 256). Copper is worked at Hofra in Nehâs, antimony (formerly) at Mount Marra. Lead occurs in the Djebel Kouttoum, situate in the Dâr el Gharb; iron in the south-western province. Salt is found in several places (pp. 269, 270). G. A. L.

Papier, A. Observations sur le mémoire de M. Goujon. [Remarks on M. Goujon's paper.] *Bull. Ac. Hippone*, no. 12, p. 56. (See above.)

Parisot, Capt. A. V. La région entre Ouarglâ et El Golêa. [The Country between Ouarglâ and El Golêa.] *Bull. Soc. Géogr. Paris*, 6 sér. t. xii. pp. 577–603.
Contains many geological notes. The paper is not yet completed.

Ravenstein, E. G. The Western Sahara. *Geogr. Mag.* vol. iii. pp. 13–16.
A sketch of the geography of the Sahara. There are extensive plateaux, ranges of mountains, vast belts of sand hills, and several depressions below the general level. The "sand hills" consist of regularly bedded Pliocene rocks (brackish or freshwater), the surface of which has been disintegrated by atmospheric action. F. D.

Rialle, Girard de. La Mer intérieure du Sahara. *Rev. Sci.* xi. pp. 409–417.
A description of M. Roudaire's expedition to survey the country around the 'chotts:' contains information on the 'chotts,' sand-hills, &c.

Schweinfurth, Dr., and Güssfeldt, Dr. A journey into the Arabian Desert of Egypt. *Geogr. Mag.* vol. iii. pp. 184–186.
Near the monastery of St. Paul are plutonic and metamorphic rocks, overlain by sandstone, on which lie U. Cretaceous rocks with fossils (Echinoderms and Ammonites); upon this is the Eocene formation, which makes the mass of the mountains. F. D.

Seriziat, Dr. Études sur l'Oasis de Biskra. [The Biskra Oasis.] *Paris.*
Treats of the hydrology and geology of the Sahara.

Stanley, H. M. Letters on his journey to Victoria Nyanza. *Proc. R. Geogr. Soc.* vol. xx. pp. 134–159. (Reprinted from *Daily Telegraph* and *New York Herald.*)

Notes the power of rain falling upon sun-heated rocks to effect disintegration, as exemplified in the country S. of Victoria Nyanza.

Tissot, C. Itinéraire de Tanger à Rbat'. [From Tangiers to Rbat'.] *Bull. Soc. Géogr. Paris*, 6 sér. t. xii. pp. 225–294.

Includes notes by **Dr. Bleicher** on the geology and physical features of the region traversed.

7. *AUSTRALASIA.*

Anon. The Australian Handbook, &c., for 1876. Pp. xx, 400, 216. 8vo. *London.*

A paragraph on the "geological formations" or "mineral resources" is given for each colony: pp. 105, 170, 245, 275, 281, 296, 317, 339, 342. R. E., Jun.

——. New South Wales; its Progress and Resources. Pp. 31. 8vo. *Sydney.*

Notes on mineral wealth, pp. 21–24.

——. Lignite seams at Coleraine (? Victoria). *Illustrated Australian News*, no 244, p. 179.

Notice of 3 new seams within 60 feet of the surface; partial analysis gives carbon 0·4, ash 0·04.

——. New Minerals, &c. at the Museum. *The Queenslander*, n. ser. vol. xi. no. 31, p. 23.

Notices the discovery of the genus *Vertebraria* in the "Ipswich (Darling Downs) Coal Basin, thereby tending to correlate it with that of Newcastle, N. S. Wales." R. E., Jun.

——. Philadelphia International Exhibition, 1875. Official Catalogue of the British Section. Part I. Pp. 418. 4to. *London.*

Colonial Section, pp. 303–418. Notices exhibits of minerals, &c. from various colonies, especially New Zealand (pp. 321–328), Queensland, with an account of the geology, &c., and a map showing the mineral areas, by **R. Daintree** (pp. 338–361, 373, 374), Tasmania, and Victoria. R. E., Jun.

——. Mining in Australia. *Iron*, vol. vii. p. 780.

Statistics of mining operations given, and notices of new discoveries of ores, &c.

——. Visit to Tungkillo Copper Mine, S. Australia, in 1850. *Iron*, vol. vii. p. 66.

——. Minerals of N. S. Wales. *Nature*, vol. xiii. p. 382.

Gives a tabular view of the succession of the U. Palæozoic rocks, as compared with their possible British representatives. Adopts the age assigned to them by Clarke, rather than that by M'Coy. R. E., Jun.

——. Geology of Australia. *Coll. Guard.* vol. xxxi. p. 144.

Describes the discovery of trunks of trees at 200 feet from the surface at Haddon, &c. Also mentions the occurrence of quartz-pebbles in or on a coal-seam. G. A. L.

Bonwick, J. The Victorian Iron Mine. *Iron*, vol. vii. p. 546.

The mine is in the Silurian Ranges S.E. of Ballaarat. The ore is

a superficial Post-Tertiary deposit, 18 feet thick, covering some thousands of acres. The contiguous Lal Lal lignite-basin is a mile long by three quarters of a mile broad; and the chief bed of lignite is 128 feet thick at one spot, and is followed by alternating beds of lignite and clay. R. E., Jun.

Buller, Dr. Presidential Address to the Wellington Philosophical Society, 1875. *Trans. N. Zealand Inst.* vol. viii. pp. 403–408.
Gives a retrospect of N. Zealand geology and palæontology.

Clarke, Rev. W. B. Anniversary Address to the Royal Society of N. S. Wales, 1875. *Trans. R. Soc. N. S. Wales*, vol. ix. pp. 1–56.
See Geological Record for 1875, p. 165.

——. Notes on Deep-sea Soundings. (Supplementary to the above.) *Trans. R. Soc. N. S. Wales*, vol. ix. pp. 57–72.
Considers that the hollows separated by ridges in which auriferous drift deposits have been accumulated in the gold-fields of the Lachlan and Currajong, N. S. Wales, resemble on a much smaller scale basins of the ocean-bottom of different depths, separated by ridges of various widths and extent, which have been brought to light in the Indian Ocean, through the 'Challenger' expedition. R. E., Jun.

——. On the Deep Oceanic Depression off Moreton Bay. Pp. 8. 8vo. *Sydney*. [Read before R. Soc. N. S. Wales, 20th July, 1876.]
Recent soundings have brought to light a submarine valley north-easterly from Moreton Bay. It is greater than that between the S. coast-line of Australia and New Zealand. Considers the phenomena exhibited by the opposite coasts of these countries to indicate that great rents and denudation in the earliest periods of our geological history were the result of depression and submergence. R. E., Jun.

Couchman, T. Report of the Chief Inspector of Mines of the Colony of Victoria for the year 1875. No. 11. Pp. 47. Fol. *Melbourne.*

Crawford, J. C. On the Old Lake System of New Zealand, with some observations as to the formation of the Canterbury Plains. *Trans. N. Zealand Inst.* vol. viii. pp. 369–375.
Lakes must have been remarkably numerous in New Zealand during Pleistocene and Recent times. The gravels of the Canterbury Plains have been deposited in their present form through the agency of lake-waters. R. E., Jun.

——. On the Igneous Rocks of the Province of Wellington. *Trans. N. Zealand Inst.* vol. viii. pp. 375–379.
Names places in which trap-dykes and other igneous rocks may be met with. Criticises Mr. Purnell's paper "On the Wanganui Tertiaries" (see Geological Record for 1875, p. 159), and does not agree with him as to the presence of a submarine volcano in the Wanganui district. R. E., Jun.

Crawford, J. C. On the Probability of Finding Extensive Coal Deposits within the Province of Wellington. *Trans. N. Zealand Inst.* vol. viii. pp. 379–383.

Coal seams perhaps underlie an area of nearly 70 miles by 40, about 1,750,000 acres. Considers the rays of the sun to be the true producers of the coal-vegetation, and that the theory which ascribes the growth of coal-plants to the effect of internal heat is incorrect.

R. E., Jun.

Etheridge, R., Jun. Observations on the Sand Dunes of the Coast of Victoria. *Trans. R. Soc. Vict.* vol. xii. pp. 2–5.

Notices the usual aspect presented by the dunes—their height, colour, composition, and angles of inclination.

Giles, E. Journey of Exploration from South to Western Australia in 1875. *Journ. R. Geogr. Soc.* vol. xlvi. pp. 328–357, map (not geological).

Notes on the occurrence of certain rocks scattered through.

Goalen, Lieut. W. N. Sections of Port Adelaide Creek, from the Outer Bar to the Port Bridge. *South Australia Parliamentary Papers*, No. 85 (2 plans of sections).

The Outer Bar consists of sand; the long ridge extending from it to the Port Bridge of a bottom stratum of clay, overlain by an undulating bed of limestone, which is covered with sand and mud.

R. E., Jun.

Gregory, A. C. Report on the Coal Deposits of the West Moreton and Darling Downs Districts. Pp. 8. Fol. *Brisbane.*

Notes on the places at which coal has been found, and on the mines. A table of analyses of Queensland coals given.

Gunn, R. C. Letter respecting the discovery of Keys in the Shore formation of Corio Bay, &c. *Trans. R. Soc. Vict.* vol. xii. pp. 123, 124.

The keys were not found in the position assigned to them, but at the bottom of the excavation, where they had accidentally fallen. (See **Rawlinson**, p. 163.) R. E., Jun.

Haast, Dr. J. Recent Cavern Researches in New Zealand. *Nature*, vol. xiv. pp. 576–579.

Harcus, W. South Australia: Its History, Resources, and Productions. Pp. xv, 432, maps and plates. 8vo. *London.*

Chap. xvi. is devoted to mines and mining, including a description of the mines and the metals found. **J. A. Plunkett** contributes an article (pp. 168–174) "On the Goldfields of the Northern Territory;' both quartz "reefing" and alluvial digging is carried on. **J. G. Knight** notices the "Building Materials" (p. 182). **J. B. Austin** gives an account of the "Mines and Minerals of South Australia" (pp. 297–312).

R. E., Jun.

Hector, Dr. J. Note [on the locality of *Harpactocarcinus tumidus*, H. Woodw., Woodpecker Bay, Brighton, N. Zealand]. *Quart. Journ. Geol. Soc.* vol. xxxii. pp. 53–56. See **Woodward**, *post*, under INVERTEBRATA.

Places the Ototara group, from which the fossil was obtained, as the upper part of the Cretaceo-Tertiary period. In general it bears the character of a littoral or shallow-water calcareo-arenaceous deposit. It appears to have no claim to a place amongst European formations.

R. E., Jun.

——. Eleventh Annual Report on the Colonial Museum and Laboratory, together with a List of Donations and Deposits during 1875–76. Pp. 28. 8vo. *Wellington.*

In the second part (Laboratory) are a number of analyses of coals, minerals, rocks, and ores.

——. On the Geology of New Zealand, with special Reference to the Drift of that Country. *Proc. Geol. Assoc.* vol. iv. no. 7, pp. 412–415 (abstract).

Icebergs do not approach within 5° of lat. of New Zealand. On the W. side of the island the air is moist, range of temperature small, and rainfall excessive; much of the moisture is precipitated as snow on the S. Alps. Mount Cook snow-field is 160 square miles in extent. The Tasman glacier is 18 miles long and 2 wide at its terminal fall. The old glaciers were far more extensive. This can only be explained by unequal elevation of the land. The great depth of the submarine valleys proves that the S.W. part of the S. Island has been greatly depressed.

W. T.

Hutton, Capt. F. W. Notes on the Maori Cooking Places at the Mouth of the Shag River. *Trans. N. Zealand Inst.* vol. viii. pp. 103–108.

An account of the exploration of a low range of sand-hills near the mouth of the Shag river is given. Deposits of shells and moa bones, with occasionally bones of the dog and seal, extend as a rule to a depth of 4 or 5 feet, but in one place to 12 feet, covered by 4 feet of clean sand. No great antiquity is assigned to the deposit. The author's conclusions differ from some of Dr. Haast's. R. E., Jun.

——. On the Cause of the former great Extension of the Glaciers in New Zealand. *Trans. N. Zealand Inst.* vol. viii. pp. 383–387.

Thinks that no reduction of temperature enough to account for the former extension of the glaciers has taken place since Miocene times, but that elevation of the land may be the main cause of that extension. Evidence seems to show that there never has been a glacial epoch in N. Zealand, and consequently none in the S. hemisphere. R. E., Jun.

——. Age of the Ototara Formation. *Geol. Mag.* dec. ii. vol. iii. p. 381.

Cretaceous fossils have not been found in the beds with *Harpactocar-*

cinus tumidus and *Palæeudyptes antarcticus*. Thinks that no Cretaceous fossils or Saurian remains have been met with on the W. coast of the S. Island of N. Zealand. R. E., Jun.

Johnston, R. M. Further Notes on the Tertiary Marine Beds at Table Cape, Tasmania. *Monthly Notices R. Soc. Tasm.* for 1876.

The section consists of:—(*a*) Cap of recent basaltic tuff. (*b*) Beds of calcareous sandstone characterized by *Turritella Warburtonii*. (*c*) The *Crassatella* bed, resting unconformably on (*d*) Metamorphosed conglomerate (? Silurian). (*e*) Highly inclined micaceous slate. *b* and *c* are the fossiliferous Table Cape beds, and form the chief subject. The beds are described in detail, and a list of fossils given. R. E., Jun.

Kayser, E. A. Report on the Country traversed between the Gilbert River and Taldora. Pp. 7. Fol. *Brisbane*. [See also *The Queenslander*, n. ser. vol. xii. Aug. 19, 26.]

Between Georgetown and the Cloncurry goldfield the country is composed of a horizontal conglomerate, unconformable on all the other rocks. Contains a sub-report, "Geological and Mining Report on the Cloncurry Goldfield." Notices the minerals there, the alluvial diggings, quartz reefs, calc-spar reefs, and copper lodes. R. E., Jun.

Krefft, G. Further discoveries of Ossiferous Caverns in New South Wales. *Geol. Mag.* dec. ii. vol. iii. p. 520.

Caves containing an ossiferous breccia, like those of the Wellington Valley, between Cowra and Canowindra, 70 or 80 miles from Bathurst, are noticed. R. E., Jun.

Mulligan, J. V. Report on an Expedition in Search of Gold and other Minerals in the Palmer Districts. Pp. 23. Fol. *Brisbane*. Geological information scattered throughout.

Napier, F. Notes on the Physical Geography and Natural History of the North Coast of Australia. Pp. 11. 8vo. *Glasgow*. [Read to Phil. Soc. Glasg. Jan. 12.]

Between long. 125° E. and long. 145° E. there is no elevation within 50 miles of the sea approaching 1000 ft. in height. The country for the most part is composed of sandstone (Desert sandstone of Daintree). R. E., Jun.

Rawlinson, T. E. Notes on the Discovery of Some Keys in the Shore Formation of Corio Bay, near Geelong. *Trans. R. Soc. Vict.* vol. xii. pp. 33–43; 5 plates.

Relates to keys found in a raised beach in an excavation for a lime-kiln, 10 ft. above high-water mark and 40 ft. inland. See **Gunn**, p. 161. R. E., Jun.

——. On the Past and Present of the Port of Melbourne, and Proposed Works for its Improvement. *Trans. R. Soc. Vict.* vol. xii. pp. 110–122, plan (not geological).

Gives notes as to the silting-up of Hobson's Bay. Recent works have facilitated the previous natural but slower process.

Reid, G. H. An Essay on New South Wales, the Mother Colony of the Australias. Pp. vi, 173, map. 8vo. *Sydney.*
Mineral progress and resources, pp. 64–80.

Russell, J. C. Lake Wakatipu, New Zealand. *Amer. Nat.* vol. x. pp. 385–392.
Gives an account of the physical features of the Lake, situated about 100 miles from the S. end of the S. Island. Regards it as in a rock basin, scooped out by glaciers, its lower end being blocked up with an immense terminal moraine. H. A. N.

Smyth, R. B. Report of Progress, Geological Survey of Victoria, for the year 1875. No. III. Pp. viii, 307 (maps, plates, and sections). 8vo. *Melbourne.*
The Progress Report (pp. 1–119) contains:—1. Departmental Report; 2. Notes on the Geology of N.E. Victoria; 3. Notes on the Geology of the Upper Yarra; 4. Notes on the Geology of Eltham and Allendale; 5. Notes on the Welcome Rust and "deep leads" at Stawell, &c.; 6. An epitome of the Geological Map of Australia; 7. Palæontological Notes; 8. Matters relating to the treatment of Auriferous Pyrites; 9. On Gold in Mine Waters; 10. On the History of the Discovery of *Phacolite* in the Richmond quarries, Melbourne. Supplementary Reports follow.
1. Report on the Geological Survey of the Ararat Goldfield, by **F. M. Krausé**, pp. 120–134. Describes the auriferous drifts and quartz lodes, and gives an historical sketch, geologically speaking, of the district.
2. Report on the Geology and Mineral Resources of South-western Gippsland, by **R. A. F. Murray**, pp. 134–174. 1. Granite (Wilson's Promontory); 2. Upper Silurian; 3. Mesozoic, referable to the subdivisions known in Victoria as Carbonaceous; 4. Tertiaries, including the older volcanic and sedimentary deposits anterior to it (Miocene), fluviatile deposits of gravel younger than the foregoing (Older Pliocene), deposits forming the wide plains of the Thomson and La Trobe (Newer Pliocene); 5. Coal seams, of which there are 6 outcrops of importance; 6. Gold workings, subdivided into quartz reefs, alluvial workings, and leads. Osmium, iridium, tin, copper, iron ores, and lignites are among the mineral productions.
3. Notes on the Microscopic Examination of Igneous Rock Specimens from S.W. Gippsland, by **A. W. Howitt**, pp. 175–177.
4. Notes on the Devonian Rocks of North Gippsland, by **A. W. Howitt**, pp. 181–249. 1. L. Devonian (the Snowy River porphyries). 2. Mid. Devonian (limestones of Buchan and Bindi, Tabberabbera shales, limestones of Cowombut and the Native Dog Creek). 3. U. Devonian (Iguana Creek beds with a distinctive U. Devonian flora, Snowy-bluff beds, Mount Tambo beds). Concludes with notes on the gold-workings

of the Devonian areas, and an appendix on the microscopic structure and the composition of some of the rocks.

5. Report on the Geological Survey of Stawell, by **Norman Taylor**, pp. 250–272. The first part is a description of the auriferous quartz lodes, with many plans. Details of the Tertiary rocks, a list of the marine fossils found in beds above the auriferous deposit of the Welcome Rush, and a list of the minerals of the district are given.

6. Report on the Kilcunda and Cape Patterson Coalfields, by **T. Cowan**, pp. 273–280.

7. Localities of Minerals which occur in Victoria, pp. 280–288; and 8. On the Reported Discovery of Coal at Sunbury, by **W. Nicholas**, pp. 288–290. No coal found.

9. Laboratory Report, by **J. C. Newbery**, pp. 290–307. Notes on the deposition of gold now going on in many mines. Analyses of basaltic rocks, "Selwynite," antimony, nickel, &c. R. E., Jun.

Thorne, G., Jun. Notes on the Discovery of Moa and Moa-hunters' Remains at Pataua River, near Whangarei. *Trans. N. Zealand Inst.* vol. viii. pp. 83–94, pls. 1–3 (implements and section).

General account of the discovery of moa bones, flint and other implements, human skeletons, &c. in superficial accumulations.

Travers, W. T. L. Notes on the Extinction of the Moa, with a Review of the Discussion on the subject published in the Transactions of the N. Z. Institute. *Trans. N. Zealand Inst.* vol. viii. pp. 58–83.

Contains many facts bearing on N. Zealand Post-Tertiary geology.

Tunny, J. M. The Coals and Coalfields in the Province of Auckland. *Trans. N. Zealand Inst.* vol. viii. pp. 387–389.

Gives analyses of 5 kinds of N. Zealand coal, and contends, from the superior quality of these, that importation of foreign coal is needless.

Ulrich, G. H. F. Report of an Inspection of the Bismuth Mine at Mount Ramsay, Tasmania. Pp. 14. 8vo. *Hobart Town.*

Native bismuth, in the form of small crystalline particles and roundish pellets, occurs in a crystalline-granular amphibolite or hornblende-rock, forming a massive contact-deposit like a "stock," and in some respects like the so-called "Fahl-bands" of Scandinavia, in the granitic mass of Mt. Ramsay, near Mt. Bischoff. The hornblende-rock contains in addition argentiferous and auriferous ores; but the bismuth itself does not contain either gold or silver. Information as to the working of the mine is given; and results of analyses of the various ores, by **J. C. Newbery**. R. E., Jun.

Wilkinson, C. S. Report to the Minister of Mines, "On the Occurrence of Gold in the Coal Measure Conglomerates of N. S. Wales." *Sydney Evening News*, no. 2940; *Sydney Morning Herald*, Dec. 2; *The Queenslander*, Dec. 16.

The Gold found in the Tertiary alluvial deposits at the Old Tallawang and Clough's Gully diggings has chiefly been derived from Coal Measure Conglomerates, associated with beds of sandstone and shale, containing *Glossopteris*. This is the first time that gold has been obtained in paying quantities from the Coal Measures of the colony. R. E., Jun.

Wilkinson, C. S. Report on the Discovery of Tin and other Metals in the Burra Burra District, between the Bogan and the Lachlan Rivers. *The Queenslander*, n. s. vol. xii. Sept. 23.

Rich beds of stream-tin exist here.

Wintle, S. H. Stanniferous Deposits of Tasmania. *Trans. R. Soc. N. S. Wales*, vol. ix. pp. 87–95, section.

Describes the deposits at Mt. Bischoff (see GEOLOGICAL RECORD for 1874, p. 159), Mt. Ramsay, Wombat Hill, Mt. Housetop, and George Bay, East Coast. The rock at Mt. Ramsay is a coarse tourmaline-granite, with older Palæozoic rocks round the base. There is also a rich lode of bismuth. At George Bay the rock is highly stanniferous granite. R. E., Jun.

Woods, Rev. J. E. T. On the History of Australian Tertiary Geology. *Monthly Notices R. Soc. Tasm.* for 1876.

Gives a sketch of the progress made in the investigation of this subject, and some remarks on the relation of the Australian Secondary and Tertiary faunas one with the other. R. E., Jun.

Victoria. Reports of the Mining Surveyors and Registrars, Dec. 31, 1875.—No. 71, pp. 37; March 31, 1876. No. 6, pp. 37; June 30. No. 26, pp. 38; September 30. No. 50, pp. 40, contains a reprint of **F. von Mueller's** paper "*Description of Fossil Plants from the Upper Tertiary Auriferous Drifts of N. S. Wales;*" pp. 39, 40, pl. 12, a description of *Rhytidocaryon Wilkinsonii*, and note on *Xylocaryon Lockii*. Fol. *Melbourne.*

——. Mineral Statistics of, for the year 1875. No. 12, pp. 56. *Melbourne.*

8. *OCEANIA (AND VARIOUS ISLANDS).*

Anon. Japanese Mines. *Quart. Journ. Sci.* n. s. vol. vi. pp. 433–440.

Notice of coal and copper mines, from a Report by **F. P. Plunkett.**

——. The Cruise of the 'Challenger.' *Nature*, vol. xiv. pp. 93–103.

Describes the white granular limestone of the Bermudas. Sketches of blown sand rocks and of a sand glacier are given. A large quantity of pumice was dredged between Yokohama and Honolulu. R. E., Jun.

Balfour, Dr. I. B. General Remarks on the Geological Structure and Flora of the Mascarene Islands. *Rep. Brit. Assoc.* for 1875, *Sections*, p. 157. [See GEOLOGICAL RECORD for 1875, p. 165.]

Birgham, Fr. Die Insel Hawaii und ihre Vulkane. [Hawaii and its Volcanoes.] *Mitth. geol. Anst.* Bd. xxii. p. 361.

Buchanan, G. Y. Preliminary Report to Prof. Wyville Thomson, on Work (Chemical and Geological) done on board H.M.S. 'Challenger.' *Proc. R. Soc.* vol. xxiv. pp. 593–623.

Part is devoted to "Observations made on shore in some of the islands visited" (p. 611). St. Vincent (Cape Verde group) consists of interbedded igneous rocks, a calcareous deposit in the low ground (formed of shells, corals, and pebbles), and sand dunes. St. Paul's rocks consist chiefly of serpentine. St. Michael's Mt. (Ferando Noronha group) is formed entirely of phonolite. Rat Island, of the same group, consists of massive basaltic rock overlain by calcareous sandstone on its E. side. Booby Island is formed of a similar sandstone; and Platform Island consists of a mass of perfect basaltic columns. The three islands of the Tristan d'Acunha group consist chiefly of volcanic rocks; there is a well-marked 35-ft. raised beach in one of the small islets composing Nightingale Island. Marion Island, in the S. Indian Ocean, is composed of a foundation of older igneous rocks, ruptured and overlain by recent volcanic matter. Kerguelen Island is formed of flat basaltic layers, from 10 to 12 feet thick, pierced by "necks" of conglomerate and cylindrical masses of phonolite. A full account of this island is given. Heard Island is volcanic, and is traversed by glaciers. The abrading action of blown sand is well shown on some of the rocks of this island. R. E., Jun.

Bulger, Lieut.-Col. G. E. A visit to Port Plair and Mount Harriet, Andaman Islands. *Canad. Nat.* vol. viii. no. 2, pp. 95–103.

The Andamans are surrounded with coral-reefs. Ross Island con-

sists of blue limestone with interbedded shales. Mt. Harriet is chiefly a coarse yellowish-green or grey absorbent sandstone. R. E., Jun.

Cazin, A. Voyage scientifique à l'Ile de St. Paul. [Researches in St. Paul's Island.] *Ann. Club alp. Franç.* 2 ann. p. 542.
Contains geological notes.

Drasche, Dr. R. von. Einige Worte über den geologischen Bau von Süd-Luzon. *Jahrb. k.-k. geol. Reichs.* (*Min. Mitth.*) Bd. xxvi. pp. 157–166.
A volcanic chain stretches along the boundary-line between the two parts of the island, with the so-called volcano of Labo, and the Sierra de Colasi, both composed of hornblende-andesite. At Ragay this rests on a highly fossiliferous limestone. The lavas of Labo rest on crystalline schists, which appear to form the ground mass of the island. Quartz-reefs occur in the schists rich in lead-glance, zinc-blende, gold, and covelline. Coralline limestone is also found. R. L. J.

——. Weitere Bemerkungen über die Geologie von Réunion und Mauritius. [Further Remarks on the Geology of Réunion and Mauritius.] *Min. Mitt.* Heft i. pp. 39–46; 5 plates, 2 woodcuts.
The earliest eruptions at Bourbon (Réunion) were submarine, and consisted of trachytic and andesitic lavas, with gabbro-like rocks; basaltic lavas, rich in olivine, were ultimately erupted, and the cone rose above the sea-level. The volcanic history of the island is traced in detail. Believes that Mauritius represents a volcano which was once much larger, and argues against a former connexion of Bourbon and Mauritius. F. W. R.

Filhol, Dr. —. [Geology of Campbell Island.] *Bull. Soc. Géogr. Paris*, 6 sér. t. xi. p. 102.
Observation in discussion. The rocks of the island (besides volcanic deposits) are U. Cretaceous and Eocene. No Pliocene beds occur.

Geinitz, Dr. H. B. Zur Geologie von Sumatra's Westküste. [Geology of W. Coast of Sumatra.] *Palæontographica*, Bd. xxii. Lief. 7, pp. 399–404; 3 woodcuts.
The following succession of strata is given:—1. Limestone, with *Fusulina*, *Crinoids*, and *Euomphalus*: Carboniferous. 2. Marl-shale, with abundant fish-remains, *Fistularia*, *Osmeroides*: U. Cretaceous or L. Tertiary. 3. Sandstone, with coal seams and carbonaceous shales: unconformable to 2; plant remains and *Melaniæ*. 4. Marl sandstone, with *Ostrea*, *Pecten*, and *Serpula*. 5. Upper (Coral) Limestone, with casts of Mollusca, Echinids, &c., Eocene. 3, 4, and 5 are correlated with the three divisions of the Eocene of Borneo. For PALÆONTOLOGY see *post*, under **Dr. W. v. d. Mark.** J. C. P.

Heurteau, E. Sur la constitution géologique et les richesses minérales de la Nouvelle Calédonie. [Geology and Mineral Resources of New Caledonia.] *Paris.* Abstract in *Bull. Soc. Géogr. Paris*, 6 sér. t. xii. pp. 648–653.

Three geological divisions, analogous to those of New Zealand, are recognized:—1. Serpentine rocks, forming the chief framework of the island; 2. A patch of crystalline and ancient rocks in the N. and N.E.; 3. Metamorphic and newer deposits, associated with igneous rocks (melaphyre), chiefly on the W. coast. Gold and copper occur in 2; iron, chromium, and nickel in 1; and there is coal, probably Liassic, on the W. coast. G. A. L.

Hosken, Lieut. H. Remarks about the New Hebrides Group. *Geol. Mag.* dec. ii. vol. iii. p. 82.

Most of the islands are of volcanic origin, with signs of upheaval, in the form of coral-blocks cropping up inland. There are no barrier-reefs; but the islands are surrounded by fringing-reefs. R. E., Jun.

Kempthorne, Rev. P. H. On the formation of Volcanic Islands; illustrated by the case of St. Helena. *6th Ann. Rep. Wellington Coll. Nat. Sci. Soc.* pp. 24–29.

Describes St. Helena.

Kneeland, Samuel. An American in Iceland. An account of its Scenery, People, and History.

Contains an account of the physical characters; the author adopts the view that the elevation above the sea took place towards the end of the Glacial period. H. A. N.

Moresby, Capt. J. Discoveries and Surveys in New Guinea and the D'Entrecasteaux Islands, a cruise in Polynesia, and visits to the Pearl-shelling Stations in Torres Straits of H.M.S. 'Basilisk.' Pp. xviii, 327, map (not geological). 8vo. *London.*

Torres Straits is dotted with islands of volcanic and coral origin. Mt. Cornwallis Is., 5 miles from the New Guinea coast, is covered with granite boulders. Of the Polynesian islands, the following are specially noticed as being of volcanic origin and usually surrounded by coral-reefs:—Kepple Is., 400 ft. high; Nina or Good Hope Is., of the Friendly group, is composed entirely of black lava, with a lake, 6 miles in circumference, in an extinct crater; volcanic phenomena are still at times active. Uea or Wallis Is., about 700 ft., is surrounded by a reef. One of the Fortuna Islands, between Wallis Is. and the Fiji islands, rises to 2000 ft. The Torres group, of 4 chief and a few small islands, are of coral-volcanic origin. Star Is. rises as a volcanic cone, 2900 ft., with an extinct crater at the summit. Blight Is. possesses the remains of an extinct crater. Ambrym Is. is an active volcano, 3000 ft. high. Lopevi Is., also active, is 5000 ft. high. The active volcano on Tauna Is. is described. The Ellice group consist of scattered islands of coral origin, as are the Nukufute or De Peyser islands, Egg or Netherland Is., and Hudson Is. Volcanic rocks are the predominating feature along the newly discovered part of the E. coast of New Guinea and outlying islands. At Port Moresby the hillside is covered with granite boulders and quartz; gold was also found here. On the N.E. shore of New Guinea there is no outlying barrier

reef, but the mountains generally run down to the sea, and are followed by a small shore reef. The coast line is but little broken up. Lesson Is. is a cone-shaped active volcano. R. E., Jun.

Prestoe, H. On the Discovery of a Boiling Lake in Dominica, W. Indies. *Proc. R. Geogr. Soc.* vol. xx. pp. 230–232.

The boiling lake in the Souffriere Valley "is a gigantic solfatara, with, apparently, an excess of water over the ejective power exerted by its gases and heat." Ebullition is confined to one point at the S.E. part of the lake. R. E., Jun.

Schneider, Dr. Geologische Uebersicht über den holländisch-ostindischen Archipel. [Geology of Dutch E. Indies.] *Jahrb. k.-k. geol. Reichs.* Bd. xxvi. pp. 113–134, tab. 5, 6 (geological maps).

Gives a short account of the formations represented, and a list of rocks, minerals, and ores, with their mode of occurrence. A sketch map has been compiled from the surveys of the Dutch Mining Engineers and the author. R. L. J.

Sidebotham, —. On Sand from inland country of New Guinea. *Proc. Lit. Phil. Soc. Manch.* vol. xv. p. 75.

Contains particles of gold, magnetic and non-magnetic iron, Foraminifera, silicified fragments of Echini, and shells.

Stone, O. C. Description of the Country and Natives of Port Moresby and Neighbourhood, New Guinea. *Proc. R. Geogr. Soc.* vol. xx. pp. 330–343; *Journ. R. Geogr. Soc.* vol. xlvi. pp. 34–62.

At Anuapata the hills are limestone, with an average height of 400 ft. Mixed with the soil are fragments of decayed coral and white non-auriferous quartz. A seam of plumbago runs along the E. shore of Fairfax Harbour. R. E., Jun.

Thomson, [Sir] C. Wyville. 1. Preliminary Report to the Hydrographer of the Admiralty on some of the Results of the Cruise of H.M.S. 'Challenger' between Hawaii and Valparaiso. *Proc. R. Soc.* vol. xxiv. pp. 463–470, pls. 15–19.—2. Report to the Hydrographer of the Admiralty on the Voyage of the 'Challenger' from the Falkland Islands to Monte Video, &c. *Ibid.* pp. 623–636, pls. 25–33.

Notes on the soundings. In no. 2 is a brief account of the Hawaiian volcanos.

Velain, Ch. Les Iles Saint Paul et Amsterdam.—L'Ile de la Réunion. Observations Géologiques faites pendant le Voyage de la Mission chargée d'aller observer le Passage de Vénus sur le Soleil à l'île Saint Paul, sous le commandement de M. Mouchez, capitaine de vaisseau. [St. Paul, Amsterdam, and Bourbon. Geological Notes taken in the Transit-of-Venus Expedition.] *Compt. Rend. Assoc. Franç.* for 1875, pp 581–600, pls. iv., v. (views).

Aden consists of trachyte, phonolite, basalt, volcanic breccia, scoriæ, and recent limestone showing elevation. Bourbon of two volcanic

"massifs," the eastern still active. The older rocks are acid trachytes, followed by basic basalts and recent olivine-lavas. St. Paul is a great crater occupied by the sea. - Hot springs and gaseous exhalations (analyses given) still exist. Acid trachytes and basic dolerites are followed by feldspathic lavas, &c.; all these are modified by siliceous infiltrations. Amsterdam consists of basaltic lavas and scoriæ.

W. H. D.

Velain, Ch. [The Volcano of Réunion.] *La Nature*, No. 160. Noticed in *Nature*, vol. xiv. pp. 333–336, with map and views.

Verbeek, R. D. M. [Geology of Sumatra.] *N. Jahrb.* Heft iv. pp. 415, 416.

Refers to the occurrence of Carboniferous Limestone fossils in Sumatra. Announces the discovery of a small extinct volcano, of which a map has been prepared. All the other volcanos in the island are colossal.

F. W. R.

Wilkinson, C. S. Notes on a Collection of Geological Specimens from the Coasts of New Guinea, Cape York, and neighbouring Islands, collected by William Macleay, Esq., &c. *Sydney Morning Herald*, March 8; *Annals*, ser. 4, vol. xviii. p. 190; *Geol. Mag.* dec. ii. vol. iii. p. 428; *Canad. Nat.* n. ser. vol. viii. pp. 156–160.

Gives a list of the rock-specimens, and concludes, from fossil evidence, that certain yellow and blue calcareous clays from Katau River, Yule Island, and Hall's Sound are L. Miocene, and like beds of that age at Geelong and Cape Otway, in Victoria. Gives a list of the fossils from Hall's Sound. The occurrence of these Miocene beds in N. Guinea suggests its former land-connexion with Australia. According to M. d'Albertis, trap is found in the valleys of Yule Island, and coralline limestone occupies the higher portions of the hills (700 to 800 ft.)

R. E., Jun.

See also:—

Darwin, C. Geological Observations on the Volcanic Islands, &c.: p. 131.

PHYSICAL GEOLOGY.

1. *PHENOMENA OF UNDERGROUND ORIGIN.*

Basile, G. I Fenomeni Vulcanici presentati dall' Etna dal Settembre 1874 a tutto l'anno 1875. [Volcanic Phenomena of Etna from Sep. 1874 to end of 1875.] *Atti Ac. Gioen. Sci. Nat.* ser. 3, t. x. pp. 289–293.

Daily record of smoke and tremblings.

Black, W. J. Eruption of Vesuvius, 1872. *Trans. Manch. Geol. Soc.* vol. xiii. part xi. pp. 361–371.

The chief stream of lava flowed from a great north fissure in the cone rising from the Atrio del Cavallo, which was filled, from whence it travelled to the villages of Massa and Sebastiano. A great shower of ashes, scoriæ, and stones fell over Naples to a depth of 2 inches, an analysis of which gave insoluble silicates of alkalies and earths, and soluble chlorides of sodium and iron. C. E. D.

Boué, A. Ueber die geometrisch-symmetrischen Form der Erdoberfläche. [Form of the Earth's Surface.] *Sitz. k. Ak. Wiss. Wien, math.-nat. Cl.* Abth. i. Bd. lxxiii. Heft 2, pp. 105–118.

Discusses the directions and limits of mountain chains.

Carret, Dr. Jules. Déplacement de l'axe polaire. [Displacement of the Polar Axis.] *Bull. Soc. Géogr. Paris*, 6 sér. t. xii. pp. 473–491, fig. in text.

The poles and the equator slowly change their positions. Gives 7 proofs under the following heads:—Polar land, complex form of the globe, the antipodes, secular movements, glacial periods, Arctic fossil floras, relationship of the fossil species. G. A. L.

Carruthers, John. Volcanic Action regarded as due to the Retardation of the Earth's Rotation. *Trans. N. Zealand Inst.* vol. viii. pp. 352–369.

The power which has raised hills and continents is derived from the retardation of the earth's rotation, owing to the friction of the tides against the bed of the ocean. The greater part of the lost motion passes away as heat, and a small part becomes volcanic action. W. W.

Darbishire, R. D. Notes on Swedish Shell-beds of Uddevalla. *Proc. Lit. Phil. Soc. Manch.* vol. xv. pp. 135–138.

These beds, on heights up to 206 feet above the sea, point to slow elevation.

Darwin, G. H. On the Influence of Geological Changes on the Earth's Axis of Rotation. *Proc. R. Soc.* vol. xxv. p. 328. See also *Amer. Journ.* ser. 3, vol. xiii. pp. 444–448.

Considers the precession and nutations of an ellipsoid of revolution slowly changing its shape, the forms of continent and ocean-bed which by transportation would produce the maximum deflection of the axis, and the actual amount of rise and fall. A single large geological change may shift the pole 3°, and, the earth not being rigid, this effect may be cumulative. W. H. D.

Désor, Prof. —. Sur les tremblements de terre et leurs causes. [Earthquakes and their Causes.] *Bull. Soc. Sci. Nat. Neuchâtel*, t. x. no. 3, pp. 342, 372.

Dutton, C. E. Critical observations on Theories of the Earth's Physical Evolution. *Penn. Monthly, Philadelphia*, May and June. See also *Geol. Mag.* dec. ii. vol. iii. pp. 322–328, 370–376.

Opposes Mallet's theory of the plication of strata and production of volcanos by contraction of the interior mass from loss of heat, quoting Sir W. Thomson's application of Fournier's conclusions to show that the contraction since the globe solidified is insufficient to account for the phenomena of disturbed strata. Points out that the character also of the disturbances is against Mallet's theory, *e. g.* alternate submergence and emergence, the occurrence of table-lands, and the neighbourhood of little-disturbed regions to belts of great flexure. Plications occur in regions of maximum deposit and at epochs during or immediately following great deposition; and in some regions there is a parallelism between the axes of flexure and the axes of maximum sediment. Advances a theory that the elevations and depressions which occurred were not relative but absolute. Regarding an uplifted area as the base of an inverted cone, with the earth's centre for apex, shows that an uplift involves an increase of volume, either by addition of matter or decrease of density, while a subsidence implies the reverse.

The subtraction and addition of matter from different areas by denudation and deposition may account for a certain amount of rising and sinking, on the supposition of the crust resting everywhere on a liquid or plastic support; but these will account only for as much movement as would have kept the areas at their old levels. Another way in which the additions of mass may occur is by the permeation of water. This addition of water may not only increase the mass but affect the density. It is probable that minerals in a state of hydrothermal solution are swollen and bulky. Hence an expansion would take place when water at high temperatures finds access to rocks. This expansion is made to account for upheavals; and as soon as the density of the underlying mass becomes less than that of the strata above, fractures of the crust would ensue. Also where deposits were greatest masses would sink in, protruding the colloid mass laterally and upwards

according to hydrostatic laws. Volcanos are an extreme case, the large quantity of water in lava rendering it so light as to need for an expelling force only the weight of the strata over the liquid reservoir.
F. D.

Everett, Prof. Seventh Report of the Committee appointed for the purpose of investigating the Rate of Increase of Underground Temperature downwards in various localities of Dry Land and under Water. *Rep. Brit. Assoc.* for 1875, pp. 14–18. Eighth Report, pp. 156–161.

Records observations at the well of La Chapelle, Paris, which show an increase of 1° Fahr. for from 102 to 111 ft.; some error, from convection, is possible. Observations at Przibram give an average rate of increase of 1° Fahr. for 120 ft.; the slow rate is considered partly due to the rock being in great part quartz rock, which has high conductivity. At Liége the increase seems to be 1° Fahr. for every 50 feet from the surface to 1600 ft. down, but at the rate of 1° to 90 ft. for the lower half of that depth.

Gives some results of observations on the temperature of the St. Gothard Tunnel. The temperature of the air (at first) was found to be the same as that of the rock 1 metre within the walls; this increased from 11°·5 C. at the entrance to 20°·45 C. at 1600 metres from the Italian end. The springs met with when first tapped were cooler than the surrounding rock; but this difference lessened much at 2000 metres. Observations on the temperature of a well at Chiswick and of a boring at Swinderby, Lincolnshire, are recorded, with remarks on the difficulty of obtaining freedom from errors due to convection, &c. F. D.

Favaro, Ant. Intorno ad alcuni studi del Dr. Schmidt, sui terremoti. [On Dr. Schmidt's Researches on Earthquakes.] *Florence.*

——. Di alcuni Fenomeni che accompagnano i terremoti e dei mezzi atti ad attenuarne gli effetti. [Phenomena accompanying Earthquakes, &c.] *Florence.*

Fisher, Rev. O. Remarks upon Mr. Mallet's Strictures on the Mathematical Test applied to his Theory of Volcanic Energy by Mr. O. Fisher. *Phil. Mag.* ser. 5, vol. i. pp. 138-142.

Though the exact conditions of a problem may be unknown, mathematics may be usefully applied for the limitation of the data with which a particular conclusion may be consistent. The coefficients assumed were those most favourable to Mr. Mallet's theory. The method used was equally applicable whether there be a viscous substratum or a solid nucleus. The objection of the nucleus being hotter than the heat of vulcanicity is invalid, for by pressure it might attain a yet greater heat.
F. D.

Fuchs, Dr. C. W. C. Bericht über die vulkanischen Ereignisse des Jahres 1875. [Volcanic Phenomena of 1875.] *Min. Mitt.* Heft ii. pp. 71–86.

The usual annual report on volcanic eruptions and earthquakes. The year was marked by many severe disturbances. 97 earthquakes are recorded. Many were undoubtedly connected with volcanic phenomena.
F. W. R.

Fuchs, K. Theorie des Volcans. *Rev. Sci.* xi. pp. 10–14; 3 figs.
An account of the ordinary structure of a volcano, the phenomena of an eruption, and explanatory theories. In fusing sulphur under water at high pressure miniature eruptions at the surface are produced during solidification. E. B. T.

Goll, Hermann. Les Mofettes de Schuols-Tarasp dans l'Engadine inférieur. [The "Mofettes" of the Lower Engadine.] *Bull. Soc. Vaud. Sci. Nat.* ser. 2, t. xiv. pp. 91–96.
The "mofettes" are hollows in metamorphic rocks, full of carbonic acid gas, and fatal to all small animals. An analysis of the gas by **Prof. Bunsen** is given. W. H. D.

Hauslab, Gen. Inference applied to Geography, with special reference to Ocean Currents and the Arctic Regions. *Journ. R. Geogr. Soc.* vol. xlv. pp. 34–45.
By prolonging certain mountain-chains we can see that there existed on the earth's surface annular chains like those on the moon (p. 39).

Hennessy, Henry. On the Internal Fluidity of the Earth. *Nature*, vol. xv. p. 78.
The theory of a solid nucleus is incompatible with physical laws.

Herschel, A. S., and G. A. Lebour. Second Report of a Committee on Experiments to determine the Thermal Conductivities of certain Rocks. *Rep. Brit. Assoc.* for 1875, pp. 54–62.
A list of rocks in order of their conductive power, with their absolute conductivities and resistances, is given. Opaque white quartz has most conductivity, cannel coal least. It was found that porous rocks had their conductivity increased by saturation with water. Some rocks conduct heat more in some directions than in others; it was found that the resistance of slate to transmission of heat along the cleavage planes is only half as great as that offered to its passage across them. In this respect great differences have been observed in various schists. F. D.

Judd, J. W. Contributions to the Study of Volcanos: On the Origin of Lake Balaton in Hungary. *Geol. Mag.* dec. ii. vol. iii. pp. 1–15, pl. 1.
Proves that Lake Balaton is due to subsidence after volcanic eruption, and, like L. Neagh and possibly the Victoria Nyanza, could not have been eroded by ice-action. Movements of the earth's crust are constantly occurring; and hollows so formed during the Glacial period would be preserved by the ice preventing silting-up. Denies the power of glaciers to excavate lake-basins. W. H. D.

——. Contributions to the Study of Volcanos. 2nd Series: On the

Volcanic Outbursts which accompanied and followed the Formation of the Alpine System. *Geol. Mag.* dec. ii. vol. iii. pp. 529–538.

At the climax, in Miocene times, of volcanic activity, a chain of volcanos traversed the Atlantic from Tristan d'Acunha to Franz Josef Land, sending off two lateral chains, one on each side of the Alpine area of depression—the northern through Germany, Austria, and S. Russia; the southern through Spain, Italy, Asia Minor, and N. India. The enormous elevations accompanying these outbursts account for the glacial beds associated with subtropical fauna. Arctic and E. European fossils disprove periodical changes of climate. The "Glacial Epoch" of W. Europe and E. America was purely local, like the more recent glaciation of New Zealand. The existence in the past, as now, of continents proves that elevation neutralizes subsidence and denudation.

W. H. D.

Kittredge, G. F. A Consideration of Facts bearing upon the Question of the Condition of the Earth's Interior. Pp. 16. 8vo. *Buffalo.*

Maintains the theory of central heat. From the evidence of wells, mines, geysers or hot springs, and volcanoes it is proved that the temperature of the earth steadily increases with depth. R. B. N.

Lory, —. Sur les Dislocations des Roches dans les Pays de Montagnes. [Dislocations in Mountain Districts.] *Compt. Rend. Assoc. Franç.* 1875, p. 679. (Abstract.)

Foldings produce schistose structure and distort fossils. Faults in soft beds produce inversions.

Mallet, R. On the Mechanism of Production of Volcanic Dykes, and on those of Monte Somma. *Quart. Journ. Geol. Soc.* vol. xxxii. pp. 472–495.

The result of observations made on the direction of the dykes of Monte Somma. Of 27 measured, the direction of but 5 or 6 passed near the axis of the Vesuvian cone, the others all widely differed; 10 were nearly vertical; of the others, 38° was the maximum inclination from the vertical. Intersections, &c. proved the dykes to be of different ages. The axes of air-bubbles are nearly horizontal and parallel with the plane of the dyke, from the dyke-substance having flowed horizontally. A difference between the two surfaces of a dyke was in some cases observed, and is not accounted for. The process by which the dykes have formed is likened to the bursting of a cannon. There is a normal pressure of the liquid lava in the crater which causes the fissures; but, from the thickness of the wall being great in proportion to the cavity of the crater, the fissures seldom reach through. The material of a cone being far from uniform, the fissure will be deflected to the line of least resistance; hence the deviation from a radial direction, which makes the dykes an unsafe guide for determining crater-position. The amount of injected dyke-material is not enough to alter palpably the slope of the mountain. F. D.

Mallet, R. On some of the conditions influencing the Projection of Discrete Solid Materials from Volcanoes, and on the mode in which Pompeii was overwhelmed. *Journ. R. Geol. Soc. Ireland*, ser. 2, vol. iv. pt. 3, pp. 144–169; 3 plates.

Different volcanoes, or the same at different times, present two distinct features. The erupted matter is in a state of fusion (lava), or is comminuted solid material, ejected at temperatures below bright incandescence and short of that of fusion. With the latter are also thrown out masses and flakes of viscous lava. Such eruptive characteristics have been for three centuries alternately displayed in the eruptions of Vesuvius, as well as of Etna. A prevalence of discrete incandescent *ejecta* is attributable to a comparatively low temperature at the deeper volcanic *foci*, or to a more infusible character of the beds through which the volcanic ducts ascend, and may occur at the close of eruptive paroxysms from diminution of local temperature. To such *ejecta* from the crater of Vesuvius, carried S.E. by the wind, the author ascribes the catastrophe of Pompeii, the dust being probably of a temperature not higher than 250° or 300° F. On the other hand Herculaneum appears to have been overwhelmed by solid discontinuous matter at a high temperature, which rolled down the side of the mountain. In neither case is there any evidence of the so-called *illuviones* or mud eruptions, the mud that has been found in those cities being only the result of the subsequent infiltration of water through the dry volcanic dust. E. T. H.

——. Mallet's Volcanic Theory "tested" by the Rev. O. Fisher. *Phil. Mag.* ser. 5, vol. i. pp. 19–22.

Mr. Fisher, in attempting to test the theory of volcanic energy by mathematical reasoning (see GEOLOGICAL RECORD for 1875, p. 172), has taken values for the coefficients of adhesion and friction which the author assumed for illustration only, and he makes other unfounded assumptions for the basis of his calculation. Until we know more of the nature of the interior of the globe, the application of mathematics is likely to mislead. Special objection is taken to Mr. Fisher's alternative conclusion that part of the heat from the work of descent of the crust is transformed into heat within the nucleus; his own assumption being that the nucleus is hotter than the heat of vulcanicity. (See **Fisher**, p. 174.) F. D.

——. Formation of the Ocean-beds by Deformation of the Spheroid. *Phil. Mag.* ser. 5, vol. ii. pp. 61, 62.

A note to guard against being supposed to agree with Rev. O. Fisher, that it was unequal radial contraction that formed the ocean-beds. Considers that our present knowledge does not enable us to fully explain the deformation of the spheroid. F. D.

Nordenskiöld, Prof. A. E. Distant Transport of Volcanic Dust. Discourse at the Annual Festival of the Swedish Academy of 1876.

Sciences. Translated by **A. Leslie.** *Geol. Mag.* dec. ii. vol. iii. pp. 292–297.

Records a shower of volcanic dust from Iceland over Norway and Sweden in March 1875, and describes the character of the different kinds. W. H. D.

Palissy, B. Resources: a Treatise on "Waters and Springs." Translated by **E. E. Willett.** Pp. viii, 39. 8vo. *Brighton.*

Written in 1557. Treats of springs, wells, earthquakes, subterranean heat, &c.

Pictet, Raoul. Notice sur la fontaine intermittente de Vichy-les-Bains. [Intermittent Spring of Vichy-les-Bains.] *Arch. Sci. Phys. Nat.* t. lvii. pp. 57–76, pl. i.

At about 100 metres below the surface is a sheet of water maintained at a constant pressure of 10 atmospheres; and at the same depth and under the same pressure is a constant supply of carbonic acid and sulphuretted hydrogen. On these assumptions the writer explains the way in which this geyser-like artificially-tapped spring acts. G. A. L.

Vogt, Prof. Carl. Lecture on Volcanoes. *Oeffentliche Vorträge gehalten in der Schweiz*, Bd. 3. *Basle.*

Wepfer, G. Ueber das Einfluss der Abkühlung unseres Planeten auf die Gebirgsbildung, ein Beitrag zur geologischen Dynamik. [Influence of the Cooling of the Earth on the Formation of Mountains.] *Jahresh. Ver. Nat. Württ.* Jahrg. 32, pp. 156–177.

Williams, W. M. The Solidity of the Earth. *Nature*, vol. xv. pp. 5, 6.

To Sir W. Thomson's statements, that rock solidified on the surface must have sunk and that the earth is solidifying from the centre outwards, replies that the earth is composed of materials of various specific gravity, from which cause they arrange themselves separately when fused, the heaviest metals going to the bottom and the metals of the earths rising to the surface with the silicon, &c. C. E. D.

2. *SURFACE PHENOMENA.*

Bayley, G. W. R. Levées as a System of Reclaiming Lowlands. *Trans. Amer. Soc. Civ. Eng.* vol. v. p. 115. (Abstract in *Proc. Inst. Civ. Eng.* vol. xlv. pp. 300–304.)

Refers especially to the Mississippi, and describes changes in its channel.

Bell, R. Glacial Striæ. *Amer. Journ.* ser. 3, vol. xii. p. 218.

Glacial striæ by Lake Winnipeg run S.W., confirming the view that the glacier had its greatest height between that region and the Atlantic coast. F. D.

Bonney, Rev. T. G. Some Notes on Glaciers. *Geol. Mag.* dec. ii. vol. iii. pp. 197–199.

The glaciers of the Alps have been retreating for years. None give evidence of any deposit like Till or Boulder-clay; the ice itself is freer from included materials than is generally supposed. Ice occasionally flows over and round an obstacle, instead of sweeping it away; when the slope is small the ice passes over débris; when the slope is greater the glacier clears its bed. A glacier is an agent of abrasion rather than of erosion, and its power to excavate rock-basins is small. W. T.

——. The Erosion of Lake-Basins by Glaciers. *Geol. Mag.* dec. ii. vol. iii. pp. 376, 377. Glacial Origin of Lake-Basins. *Ibid.* pp. 521, 522.

Refers to Mr. Fisher's letter (p. 181). There are no lakes in the Alpine valleys above the great lakes. The water beneath the ice in a lake-basin would probably be unfavourable to denudation. Refers to Mr. H. Miller's papers; admitting that glaciers have some erosive power, and that small tarns may have been thus formed, it does not follow that large lakes have been formed in the same way. W. T.

Brodie, Rev. J. On the Action of Ice in what is usually termed the Glacial Period. *Rep. Brit. Assoc.* for 1875, *Sections*, pp. 63, 64.

Maintains that the Glacial Period was not one of general contemporaneous cold in all places where ice-marks are found. When the climate was cold in one place it was warm in others. F. D.

Brown, Dr. J. C. Reboisement in France; or Records of the Re-planting of the Alps, Cevennes, and the Pyrenees with Trees, Herbage, and Bush. 8vo. *London.*

Records the destructive action of floods caused by felling forests, and the lessening of the floods from re-planting the hill-slopes.

Burns, D. On the Mechanics of Glaciers. *Geol. Mag.* dec. ii. vol. iii. pp. 297–303.

Criticises Dr. Croll's papers, referring to the molecular theory of glacier-motion, crevasses, the denuding power of glaciers, and Mr. Goodchild's views on the origin of coums. J. G. G.

Campbell, J. F. My Circular Notes. Extracts from..... Geological and other notes, written while travelling westwards round the World, from July 6, 1874, to July 6, 1875. 2 vols. pp. 356, 331. 8vo. *London.*

In the account of his journey through N. America, Japan, Java, and Ceylon, the author makes frequent references to the geology of the countries traversed by him, especially noticing glacial and volcanic phenomena. Under "The Period of Polar Glaciation" (vol. 2, pp. 213–323), he discusses the question of the former existence of a general glacial period over the whole of the northern hemisphere, and concludes that there is no evidence of a former period characterized by a generally prevailing climate colder than that of the present day, and that no valid grounds exist for the belief in an alternation of universal hot and cold periods on the earth's surface. He regards the alterations in the circulation of air and water, which must have been produced by movements of the earth's solid crust, as sufficient to account for all the changes of climate which have taken place. He gives a number of facts in support of his conclusion that the "Glacial Epoch" did not extend beyond the W. parts of Europe and the E. half of the N. American continent. J. W. J.

C[ampbell], J. [F.]. Firths, Dales, and Lakes, Valleys and Cañons. *Nature*, vol. xiii. p. 230, 231.

Hollows in the earth's surface may be known as water-work, or ice-work, by their shape. Firths, dales, and lakes mark local glacial periods; cañons the districts of climates that have not been glacial since the streams began to flow. C. E. D.

Croll, Dr. J. Remarks on Mr. Burns's Paper on the Mechanics of Glaciers. *Geol. Mag.* dec. ii. vol. iii. pp. 361–364.

Reprints part of Chap. xxxi. of 'Climate and Time,' and points out that Mr. Burns (see above) has misunderstood his views.

Czerny, Dr. Franz. Die Wirkungen der Winde auf die Gestaltung der Erde. [Action of the Winds on the Form of the Earth.] *Mitth. geogr. Anst.* Bd. xxii. No. 48, pp. 53, with map of winds. Abstract in *Nature*, vol. xiii. pp. 239, 240.

Part 1 contains a review of the course of the winds over the earth's surface. Part 2 treats of their action on the solid land, whether directly or through the medium of the waters of the ocean. Under the former head, the movement of sand, of volcanic dust, &c. is spoken of, special mention being made of the loess of China, which Richthofen attributes to winds. Under the latter come both ordinary marine

denudation and the action of wind-drift currents as agents of transport. Part 3 treats of certain geological phenomena indirectly produced by wind, including the effect of air-pressure on volcanic eruptions and on earthquakes. F. D.

Dana, J. D. Note on Erosion. *Amer. Journ.* ser. 3, vol. xii. pp. 192, 193.

Attributes much of the eroding action of rivers to the direct force of the water itself, without the aid of carried detritus. Soft rocks the river wears away bit by bit; harder rocks it tears up by the joints. Such work will greatly increase with the increased velocity of floods. Similarly, glaciers do more by the ploughing action of the ice itself than by means of stones at the bottom. F. D.

Dumas-Vence. Notice sur les côtes de la Manche. [On the shores of the British Channel.] *Rev. Mar. Col.* vol. xlviii. pp. 371–414, 727–772.

Investigates the accounts of changes of the coast-line, whether from erosion by the sea or from upheaval or subsidence.

Ebray, Th. Stries pseudo-glaciaires. [Pseudo-glacial Striæ.] *Bull. Soc. Géol. France*, 3 sér. t. iv. pp. 55, 56.

Note on possible non-glacial explanation of some striated pebbles.

Evans, John. On the Percolation of the Rainfall on Absorbent Soils. *Proc. Inst. Civ. Eng.* vol. xlv. pp. 208–216.

Results of experiments with ordinary soil of Hemel Hempstead, Herts, and with fragments of Upper Chalk.

Fisher, Rev. O. On the Theory of the Erosion of Lake Basins by Glaciers. *Geol. Mag.* dec. ii. vol. iii. pp. 253–255.

Observations at the edges of glaciers tell us little of what goes on beneath the central part of an ice-field. If the Swiss lakes were excavated by ice, it was when the ice spread far beyond its present boundaries, and under conditions different from those now observed. There must be more or less water between the ice and the bottom of a lake-basin; and, for the ice to touch the bottom it must rise above the level of the outlet. The ice would be thawed by contact with the rock; and so a continual circulation of water would be set up from even the deepest part of the lake-basin toward the outflow. This water must have an abrading effect. W. T.

——. Mr. Milne on Floating Ice. *Geol. Mag.* dec. ii. vol. iii. p. 379.

Criticises Mr. Milne's account of icebergs, &c. (see p. 185).

Foulerton, Dr. J. The Glacial Period. *Proc. W. Lond. Sci. Assoc.* vol. i. pp, 64–66. (Abstract.)

Description of glaciers, and of the evidence of glacial action.

Fry, E. On Moraines as the retaining Walls of Lakes. *Rep. Brit. Assoc.* for 1875, *Sections*, p. 64.

Asks why old terminal moraines are said to act as dams to lakes, when those of existing glaciers are all cut through by the streams from the glaciers. F. D.

Geikie, James. Origin of Lake Basins. *Geol. Mag.* dec. ii. vol. iii. pp. 139, 140.

Objects to the logic in Mr. Judd's paper (see p. 183), and to his assumption that Ramsay's theory is to be universally applied.

——. Dr. H. Landor on Ground-Ice as a Carrier of Stones and Débris. *Geol. Mag.* dec. ii. vol. iii. pp. 459–463.

Reprint of a paper published in 1869.

Greaves, C. On Evaporation and on Percolation. *Proc. Inst. Civ. Eng.* vol. xlv. pp. 19–47.

Gives results of experiments on percolation through various artificial soils. The discussion (pp. 48–105) contains many references to geological questions. W. T.

Green, Prof. A. H. Mr. Judd on Glacial Erosion and Subaerial Denudation. *Geol. Mag.* dec. ii. vol. iii. pp. 141–143.

No one supposes that all rock-basins are of glacial origin, or that subterranean forces have had no influence in producing the features of the earth. W. T.

Greenwood, Col. G. Rain and Rivers. Ed. 3. 8vo. *London.*

——. Glacial Erosion. *Geol. Mag.* dec. ii. vol. iii. p. 144.

Postscript to a letter noticed in the Geological Record for 1875, p. 183.

Gunn, John. On the Influx and Stranding of Icebergs during the so-called Glacial Epoch, and a suggestion of the possible cause of the Oscillation of the Level of Land and Water to which that Influx may be due. *Rep. Brit. Assoc.* for 1875, *Sections*, p. 66.

An influx of icebergs was due to increased area and depth of sea; this would indicate a milder climate, while marks of glaciers would indicate cold. Suggests that the alternation may be due to the motion of the solar system in space. F. D.

Gunn, W. Subaerial Denudation *versus* Glacial Erosion. *Geol. Mag.* dec. ii. vol. iii. pp. 97–105; 2 woodcuts.

A criticism of Mr. Goodchild's theory. Contends that subaerial denudation is competent to produce the escarpments and scars of the Yorkshire dales. Limestone wears less rapidly under subaerial agencies than is often supposed. W. T.

Holmes, T. V. Glacial Erosion. *Geol. Mag.* dec. ii. vol. iii. pp. 189, 190.

Believes that rivers sometimes scoop out basins, and that glaciers may do the same.

Holst, Dr. N. O. Om de glaciala rullstens åsarne. *Geol. Fören. Stockholm Förh.* Bd. iii. No. 3, p. 97–112.

Explains the origin of åsar; thinks they have been formed by streams flowing on the surface of the ice, which washed out and rounded the stones imbedded in the glacier. E. E.

Hull, Prof. E. Mr. Judd and the Glacial Erosion of Lakes. *Geol. Mag.* dec. ii. vol. iii. pp. 140, 141.

Mr. Judd's objections (see below) have been anticipated by Prof. Ramsay. Some lakes are due to disturbance of the strata, some to subsidence from the dissolving away of underlying limestone or of salt. W. T.

Judd, Prof. J. W. On the Origin of Lakes. *Geol. Mag.* dec. ii. vol. iii. pp. 187–189.

The glacial origin of lake-basins is not proved; nor is it proved that other agencies, or a combination of them, are incompetent to have performed the work. Subterranean actions, attended by more or less local surface-movements, went on side by side with, and modified the effect of, subaërial forces. W. T.

——. Formation of Rock-basins. *Geol. Mag.* dec. ii. vol. iii. pp. 523–525.

The belief in the excavating power of ice is of various degrees. No one believes that the rock-basin of the Black Sea is of glacial origin; the author's faith in this matter stops short of any thing that can fairly be called a "lake" at all. The Cambrian beds of Sutherlandshire will probably be found to have been subjected to flexures and fractures more than sufficient to dam up the drainage of a highland glen. W. T.

Kinahan, G. H. The Drifting Power of Tidal Currents *versus* that of Wind-waves. *Proc. R. Irish Acad.* ser. 2, vol. ii. pp. 443–458. Abstract in *Geol. Mag.* dec. ii. vol. iii. pp. 83–87. See also *Rep. Brit. Assoc.* for 1875, *Sections*, p. 74.

Wind-waves do but little permanent work if unaided by tidal currents; they are most powerful at the lowest ebbs. Falling tides have but little driftage power; rising tides do most, especially when aided by wind. An indented coast produces countercurrents, as do also river-bars. W. H. D.

——. Irish Tide Heights and Raised Beaches. *Geol. Mag.* dec. ii. vol. iii. pp. 78–82.

Shows by tables that the spring-tide high-water-mark is not a perfect level round Ireland, so that an undulating raised beach does not prove unequal elevation. W. H. D.

Kinkelin, Dr. Fried. Ueber die Eiszeit. [The Glacial Epoch.]

Ber. Senckenb. nat. Ges. June 1874—June 1875 [pub. 1876], pp. 77–133, with map of old glaciers.

Treats (1) of the action of glaciers and the formation of moraines; (2) of the history of the extension of old glaciers in Switzerland, &c.

Mackintosh, D. Queries and Remarks relative to existing Ice-action in Greenland and the Alps, compared with former Ice-action in the N.W. of England and Wales. *Rep. Brit. Assoc.* for 1875, *Sections*, p. 76.

Noticed, under a shorter title, in the GEOLOGICAL RECORD for 1875, p. 185.

——. On the geological meaning of the term "River-basin," and the desirability of substituting "Drainage-area." *Rep. Brit. Assoc.* for 1875, *Sections*, p. 75.

Drainage-areas are not "basins;" the watershed as a rule does not run along the highest ground, but high mountains often occur near the centre of the area. The geological cause of this fact is alluded to.

W. T.

——. Results of Observations on the Eskers, Lake-basins, and Post Glacial River-courses of Cheshire, Shropshire, Denbighshire, and Flintshire; with Remarks on the Sequence of Glacial Events in the N.W. of England and Wales. (*Chester Soc. Nat. Hist.*) Abstract in *Geol. Mag.* dec. ii. vol. iii. pp. 272–274.

——. Mr. Reade on Drift-Sequence, and Mr. Milne on Coast-Ice. *Geol. Mag.* dec. ii. vol. iii. p. 528.

The Brick-clay of the N.W. of England is a true Boulder Clay. Floating ice has had much to do with the glaciation of Wales and N.W. England. W. T.

Meunier, Dr. S. Mémoire sur les Alluvions Verticales. [Vertical Alluvium.] *Bull. Soc. Imp. Nat. Mosc.* t. li. pp. 174–202.

Gives this name to material brought by water rising towards the surface by solution of calcareous beds or in faults. Describes, as thus formed, granitic sand filling a fault near Beynes, a block of sandstone in which was metamorphosed at the surface. Regards the red clay of the French Drift and glauconitic Tertiaries as partly due to the same cause. W. H. D.

Miller, Hugh. Northumberland Escarpments and Yorkshire Terraces. *Geol. Mag.* dec. ii. vol. iii. pp. 23–33.

Chiefly in criticism of Mr. Goodchild's views, and referring especially to a tract of country between Haltwhistle and Wark. The rocks are alternations of thick sandstones, shales, and thin limestones, the "Whin Sill" producing the boldest feature. The escarpments are pre-glacial. Reasons are given why glacial action alone is not competent to produce

the surface-features now observed, which the author holds to be due to subaërial action. W. T.

Miller, Hugh. Glacial origin of Lake-Basins. *Geol. Mag.* dec. ii. vol. iii. pp. 286, 287.

Evidence of erosion is afforded when lakes lie among regular and well-exposed strata, as, for instance, the Northumberland lakes and Semerwater in Yorkshire, and lakes in the Cambrian sandstone in Ross and Sutherland. From Suilven more than 200 lakes and tarns can be counted. W. T.

——. Considerations bearing on Theories of the Formation of Rock-basins. *Geol. Mag.* dec. ii. vol. iii. pp. 451–455.

If glaciers can excavate at all they can more easily enlarge a lake than they can start it. If lake-basins 2600 feet deep are due to depression, the influence of this ought to be seen in the neighbouring highlands. W. T.

Milne, Prof. J. Ice and Ice-Work in Newfoundland. *Geol. Mag.* dec. ii. vol. iii. pp. 303–308, 345–350, 403–410; 2 woodcuts.

Discusses theoretical considerations on the flotation of icebergs; aspect of Newfoundland; ice-marks, W. Newfoundland; drift; coast-ice; ice-foot; movements of coast-ice; possibility of a sequence in ice-action. Explains how glaciation and transport of boulders may result from coast-ice. W. T.

Murphy, J. J. The Glacial Climate and the Polar Ice-cap. *Quart. Journ. Geol. Soc.* vol. xxxii. pp. 400–406; and *Proc. Belfast Nat. Hist. Phil. Soc.* 1875–76, pp. 18–33.

Examines Croll's conclusion that, in the case of maximum eccentricity of the earth's orbit, the glaciated hemisphere is that which has its winter in aphelion. Taking the maximum eccentricity at 0·069, the heat received by the earth at the N. midsummer would be less than at present in the ratio of 0·875 to 0·967, or nearly a tenth less. The effect of this on terrestrial temperatures is estimated by comparison with the supposed temperature of space; and it results that the present difference between summer and winter would be destroyed, in the N. hemisphere, in all but the most extreme climates, and even that a reversal of seasons will take place nearly to the Arctic Circle; so that, at the border of the frozen circumpolar area, the annual range is reduced to nothing. The result will be that then the ice and snow will never melt, and a polar ice-cap will be formed. In the S. hemisphere the great heat of the perihelion summer will rapidly melt the snow that fell during the aphelion winter. To Croll's argument that in the Antarctic regions, where the summer is in perihelion, there is now a glacial climate, he replies that the present Antarctic climate is a maritime one, and hence its range of temperature is not great; it would be different if land and sea were equally distributed in the two hemispheres. F. D.

Penning, W. H. Waste of Insular Land by the Sea. *Geol. Mag.* dec. ii. vol. iii. pp. 282–284.

Letter, with map of Heligoland in A.D. 800, 1300, and 1649. 600 sq. miles have been lost in 1076 years.

Peschel, Oscar. Neue Probleme der vergleichenden Erdkunde als Versuch einer Morphologie der Erdoberfläche. [Comparative Geography, &c.] Ed. 2, pp. 21; 53 pls. 8vo. *Leipzig.*

The subjects treated are:—The formation of fjords; origin of islands; fauna and flora of islands; geographical homologies; continents dependent on mean depth of oceans; position of mountains near edges of continents; rising and sinking of coasts; changes since the Tertiary epoch; formation of deltas; river beds and formation of valleys; origin of lakes, deserts, steppes, &c. E. B. T.

Pilar, Dr. G. Ein Beitrag zur Frage über die Ursache der Eiszeiten. [Causes of Glacial Epochs.] *Agram.*

Rehearses evidence of glacial action in Europe, America, and New Zealand, citing the subarctic fauna and flora of the prehistoric age in W. Europe, and the lowering of temperature in historic times. Any theory to be satisfactory must be cosmical, not local. Prefers Croll's theory to Dr. Schmick's view, that solar attraction increases the volume of the ocean in each hemisphere alternately. Gives a *résumé* of other theories. W. H. D.

Ramsay, Prof. A. C. The Origin of Lake Basins. *Geol. Mag.* dec. ii. vol. iii. pp. 136–138.

A reply to Mr. Judd (see p. 183). The author never intended his theory of the glacial erosion of lake-basins to be applied universally. Some lakes are parts of old sea-bottoms; some are dammed up by Drift; some are volcanic; and some may be of unknown origin. His theory applies to rock-basins in glaciated areas. F. D.

Richardson, Ralph. The Ice Age in Britain, considered in Relation to the Depth of the North Atlantic Ocean as determined by Recent and Earlier Deep-Sea Soundings. Pp. 19. 8vo. *Edinburgh.*

Describes the bed of the Atlantic, and the oscillations of Glacial and Post-Glacial times in W. Europe. Suggests that in the Glacial Period Europe and Greenland were united and the Gulf Stream diverted. W. H. D.

Schmidt, Prof. Friedrich. On the Post-Glacial Period in Esthonia. (St. Petersburg Society of Naturalists.) *Nature*, vol. xv. p. 88.

Considers that Esthonia, Scandinavia, Finland, and Northern Russia to Waldai plateau, were covered during the Glacial epoch by an ice-sheet, after which there was a post-glacial submergence of Esthonia to 60 feet beneath the sea, and of E. Sweden to 100–120 feet, while in Finland marine clays do not occur above 62 feet. C. E. R.

Sternberg, H. [Researches on the Form of the Longitudinal and Cross Sections of Gravel-Bearing Rivers.] *Zeitschrift für Bauwesen*, vol. xxv. pp. 483–506. (Abstract in *Proc. Inst. Civ. Eng.* vol. xliv. pp. 258–261.)

A mathematical inquiry into the conditions of the abrasion and transportation of boulders, and into the form of an ideal cross section, which should remain unchanged, the velocity remaining constant at all levels, and the transport of gravel being continuous. It is necessary that the channel should be bounded by catenary curves. In most watercourses, from the wetted perimeter being too great when the water is low, and too small when the water is high, the boulders are not kept in motion in the former case, and are transported impetuously in the latter. F. D.

Symonds, Rev. W. S. Among Glaciers Recent and Extinct. *Pop. Sci. Rev.* vol. xv. pp. 169–182.

A general account of glacial action—of the oscillation of Swiss glaciers within recent years, and their great extension during the Glacial period, and of the glaciation of Britain and the Glacial deposits of the E. of England. The last stage of the Glacial period in Britain was a return of the glaciers on the Highlands and heavy falls of snow on the lower hills, the melting of which in summer caused great floods over the lower lands. This was after the days of the cave-men; the return of glacial conditions destroyed the mammoth and the tichorhine rhinoceros. W. T.

Torell, Prof. Otto. On the Glacial Phenomena of North America. *Proc. Amer. Assoc.* Abstract in *New York Times*, Aug. 30, and *Amer. Journ.* ser. 3, vol. xiii. pp. 76–79 (1877).

Describes deposits produced by glaciers in advancing and retreating. The American drift came from the N.E. (Greenland).

Tylor, A. Denuding Agencies and Geological Deposition under the Flow of Ice and Water, with the laws which regulate these actions, and the special bearing on river-action of observations on the Mississippi and other great rivers, and their present and past Meteorological conditions, and similar remarks on Marine Deposits, illustrated by the Irish Sea and the Chesil Beach. *Geol. Mag.* dec. ii. vol. iii. pp. 90–93. Fuller abstract than in *Quart. Journ. Geol. Soc.* vol. xxxii. *Proceedings*, pp. 4–9.

The present contours are mainly due to a Pluvial period. The rainfall is greater in summer than in winter. Flexures, not fractures, determined the valley system of the Weald. Longitudinal sections of large valleys are parabolic curves. *Curve* of denudation is a more correct term than *plane*. Tidal waves do not coincide with the time of high water, which depends on local causes. A slight horizontal motion of the central mass of the ocean will produce great vertical motion on the shores. W. H. D.

Vézian, A. Les périodes glaciaires et les causes de leur apparition. [Glacial periods, &c.] *Rev. Sci.* xi. pp. 536–543.

Reviews the various explanations of recurring glacial periods, adopting that of the unequal distribution of heat in space in which the solar system is moving. E. B. T.

See also :—

Ramsay, Prof. A. C. Anglesey: p. 31.

——. The Dee: p. 32.

Tyndall, Prof. J. Parallel Roads of Glen Roy: p. 37.

3. *ROCK-FORMATION.*

Boulger, Prof. G. S. Rocks of Animal Origin. *Proc. W. Lond. Sci. Assoc.* vol. i. pt. iii. pp. 103–109.

The Laurentian graphite and ironstone are probably due to vegetal organisms. All limestones are of organic origin. The formation from organic sources of chalk, greensand, red clay, and "coprolite" is referred to. W. H. D.

Duncan, Prof. P. M. Limestone Makers. *Nature*, vol. xiv. pp. 9, 10.

The form described by Mr. Munro (see below) as contributing largely towards the formation of coral-sand is the genus *Corallina*, a very common limestone-maker at the Bermudas. F. D.

Hardman, E. T. The Deep-sea Manganiferous Muds. *Nature*, vol. xv. pp. 57, 58.

Suggests that the *Globigerina*-shells may have contained carbonate of manganese derived from sea water, which carbonate would be dissolved as the shell passed through water charged with carbonic acid and oxygen, and the manganese would be deposited as a peroxide. C. E. D.

Jukes-Browne, A. J. The Origin of the Greensand. *Sci. Goss.* No. 134, pp. 30, 31, No. 140, pp. 170, 171.

Insists, in opposition to a paper by Mr. Stewart (see GEOLOGICAL RECORD for 1875, p. 192), that "some greensands do mainly consist of foraminiferal casts," giving as an example the Cambridge bed, which contains glauconitic casts in abundance. The second part is purely controversial. W. W.

Malet, H. P. Flints in Chalk. *Land and Water*, Oct. 7, p. 246.

Gives suggestions as to the mode of formation of the layers and nodules of flint in the chalk.

Monckman, J. The Staining of Rocks beneath the Magnesian Limestone. *Geol. Mag.* dec. ii. vol. iii. pp. 476, 477.

Endeavouring to account for some of the Carboniferous rocks having been stained through being overlain by Magnesian Limestone, an experiment was made in which water containing carbonic acid and limestone-powder was dropped on grit and stained it dark red, though no iron could be detected in the liquid. W. H. D.

Munro, John. On the Formation of Coral Sand. *Nature*, vol. xiii. pp. 510, 511.

At Santa Cruz, W. Indies, the coral-limestone is made up of coral-blocks, consolidated coral sand and mud, shells, &c. The mud may be

produced by the trituration of coral-skeletons; but the coarse-grained calcareous sand consists of fragments of the calcareous skeleton of a sea-weed which grows plentifully on the reefs. The sand on the beach was chiefly made up of scales of the sea-weed, more or less worn. (See **Duncan**, above.) F. D.

Murray, J. On the Distribution of Volcanic *Débris* over the Floor of the Ocean,—its character, source, and some of the Products of its Disintegration and Decomposition. *Proc. R. Soc. Edin.* vol. ix. no. 96, pp. 247–261.

Describes the instruments in use for obtaining information on the deposits, and enumerates the various kinds of volcanic *débris* found, and some of the products of their decomposition, concluding that clayey deposits far from land are chiefly derived from the felspars of fragmental volcanic rocks. Gives an account of the occurrence of peroxide of manganese, native iron, and cosmic dust. H. A. N.

——. Preliminary Reports to Prof. Wyville Thomson on Work done on board H.M.S. 'Challenger.' *Proc. R. Soc.* vol. xxiv. p. 471, pl. 20.

A detailed list of soundings made is classed under the following heads:—Shore Deposits (blue and green muds, near the shores of most of the great continents and islands; grey muds and sands, near oceanic islands of volcanic origin; red mud, E. coast of S. America; coral mud, near coral reefs). Globigerina-ooze, an oceanic deposit not met with S. of 50° S. lat. Radiolarian ooze, an oceanic deposit only in the W. and Mid Pacific. Diatomaceous ooze, an oceanic deposit met with only S. of 50° S. lat. Red and grey clays, the most abundant oceanic deposits. Remarks on the origin of deep-sea clays. R. E., Jun.

Pankhurst, E. A. Some of the Problems connected with the Deposition and Crystallization of Silica. 23*rd Ann. Rep. Brighton Nat. Hist. Soc.* pp. 142–153.

Refers to the presence of soluble silicates in mineral springs and sea-water, the manganese nodules of the Pacific, the Triassic Beekites, agates, opal, flint, and the general chemistry of hydrous silica. W. H. D.

Potter, C. The So-called Forest Beds. 23*rd Ann. Rep. Brighton Nat. Hist. Soc.* pp. 10–12.

Argues, from observations in Cheshire, against the forest-beds being in place. There is but 1 butt to 10 trunks; and the expansion in growth of roots would have destroyed the lamination of the silt in which they are imbedded. W. H. D.

Ramsay, William. On the Influence of various Substances in Accelerating the Precipitation of Clay suspended in Water. *Quart. Journ. Geol. Soc.* vol. xxxii. pp. 129–132. With note by **Prof. A. C. Ramsay.**

Those salts in solution which absorb most heat in dissolving precipi-

tate clay fastest. Saline solutions faster than acid. Strong solutions than weak. Hot solutions than cooler. Great amplitude of vibration of molecules of water is suggested as explaining the effect of heat. The note indicates the geological bearings of these facts. W. H. D.

Rawlinson, Sir H. C. Address at the Anniversary Meeting of the Roy. Geogr. Society. *Proc. Roy. Geogr. Soc.* vol. xx. pp. 413, 414.
An account of Prof. Wyville Thomson's observations on the sea-bottom of the Pacific, made on board the 'Challenger.'

Stewart, S. A. The Origin of the Greensand. *Sci. Goss.* No. 136, pp. 81, 82.
An answer to Mr. Jukes-Browne's communication (see above).

APPLIED AND ECONOMIC GEOLOGY.

Ackerman, R. The Iron Manufacture of Sweden at the present time. *Iron*, n. s. vol. vii. pp. 386, 450, 482, 514, 546, 611.

Describes coal of Skone and the various iron-ores. Later parts are metallurgical. Vol. viii. p. 66. Statistics of production.

——. On the Present State of the Iron Manufacture in Sweden. *Lond.* [A reprint of the foregoing.] With map, showing the position of the iron-mines, and Appendix containing over 500 analyses of Swedish iron-ores.

Aigner, A. Ueber die Fabrication von Cementröhren am k. k. Salzberg Ischl. [Manufacture of Cement Water-pipes.] *Berg- Hütt. Jahrb.* vol. xxiv. pp. 1–14.

At pp. 8–14 is a detailed list of memoirs on hydraulic limestones, cement, concrete, and allied subjects.

André, G. G. A Practical Treatise on Coal Mining. Vol. i. pp. x, 280, 36 plates (1–6 sections, &c., 7–12 fossils). Vol. ii. pp. viii, 563, pls. 37–84.

Anon. Sulle condizioni di sicurezza delle Miniere di Lercura in Sicilia. [Conditions of Security of Lercura Mines.] *Boll. R. Com. geol. Ital.* vol. vii. pp. 167–169.

Notice of work of a Commission whose report was published at Rome in 1875. The produce of sulphur in 1873 was 255,000 cwt.; but increase of water and destructive crumblings have much damaged the mines and reduced the output. E. B. T.

——. Carbon from Shale. *Journ. Soc. Arts*, vol. xxiv. no. 1227, p. 676.

The so-called "sanitary carbon" is the residual product of the destructive distillation of bituminous shale from Kimeridge Clay.

——. Winning of the Silkstone Coal at Hoyland Nether. *Coll. Guard.* vol. xxxi. pp. 388, 389.

——. Pyrites in France. *Iron*, n. s. vol. vii. p. 551.

Chiefly from two districts—Rhône and Gard and Ardèche.

——. The Iron Manufacture of Russia. *Iron*, n. s. vol. viii. p. 262. (From the *Deutscher Submissions-Anzeiger.*)

——. Iron Ore and Slate in Tennessee. *Iron*, n. s. vol. viii. p. 515.

A notice of hæmatite, copper-ores, and slate at Tellico in Munroe County.

Anon. Iron Mines of Cleveland. South Cleveland and the Iron Trade. Duration of the Cleveland Iron Fields. *Iron*, n. s. vol. vii. p. 678, vol. viii. pp. 553, 614.
Historical, statistical, and in part geological.

——. Iron in Tennessee. *Iron*, n. s. vol. viii. pp. 646, 710, 746, 810.
Statistics of production, and description of mineral districts.

——. Minerals at the Centennial Exhibition (Philadelphia). *Iron*, n. s. vol. viii. pp. 677, 678.
Notice of minerals, rocks, and ores exhibited. Relates chiefly to America.

——. [The Mining and Metallurgical Produce of Austria in 1875.] *Oest. Zeit. Berg- Hütt.* vol. xxiv. p. 293. (Abstract in *Proc. Inst. Civ. Eng.* vol. xlvi. pp. 356–358.)

——. Progress of Mining in Russia in 1875. *Iron*, n. s. vol. viii. p. 547. (From *Berg- Hütt. Zeitung.*)

——. Artesian Wells in Spain. *La Gaceta Industrial*, no. 20. (Abstract in *Proc. Inst. Civ. Eng.* vol. xlvii. pp. 356, 357.)
Description of wells in Valencia and Murcia.

Bell, R. Mining in Canada in 1875. *Iron*, n. s. vol. viii. pp. 6, 41, 229.
Notes on mineral districts, with statistics. Gold, silver, copper and lead, iron.

Bensusan, S. L. Facts in American Mining. *Trans. R. Soc. N. S. Wales*, vol. ix. pp. 73–85.
Divides the subject under following headings:—(1) Mode of occurrence of lodes, veins, &c. (2) Methods of gold mining. (3) Treatment of the metals. (4) Loss of gold. (5) Statistics. References are made to Australian localities by way of illustration. R. E., Jun.

Bilharz, O. The Zinc-Ore Deposit at Moresnet (Vieille Montagne). *Rev. Univ. Mines*, vol. xl. pp. 235–239. (Abstract in *Proc. Inst. Civ. Eng.* vol. xlvii. pp. 394–396.)
Occurs in Carboniferous Limestone, here generally a dolomite. The ore near the surface is carbonate, but changes in depth to hydrated silicate. W. T.

Blair, W. N. On the Building Stones of Otago. *Trans. N. Zealand Inst.* vol. viii. pp. 123–166.
The sections of geological interest are:—"On the Building Stones," pp. 124–148; and "Roofing Materials," pp. 162–164.

Blanchard, F. Sulla scoperta della Cassiterite a Campiglia Marittima. 1876. o

[Discovery of Tin-ore at Campiglia.] *Boll. R. Com. geol. Ital.* vol. vii. pp. 52–54.

Cento Camerelle, on the W. side of Monte Fumacchio, is the name given to old workings of Etruscans and Romans, who mined the iron-deposits. A small tin-vein is now found here, accompanied with limonite; it has an E.–W. direction, with underlay to S., and is enclosed in L. Lias limestones. In the neighbourhood are hot springs, which rise from a manganese vein. E. B. T.

Boyd, C. The Mineral Wealth of South-Eastern Virginia. *Iron*, n. s. vol. viii. pp. 330, 424. (*Amer. Inst. Min. Eng.*)

Callon, J. Lectures on Mining.... Translated by **Dr. C. Le Neve Foster** and **W. Galloway**. 8vo. *London and Paris*. Vol. i. pp. vii, 459; 4to Atlas of 40 plates (i.–viii. geological).

Chap. i. *Definitions and Introduction*: Summary of geological principles; description of beds, lodes, faults, &c. Chap. ii. *Various Examples of Deposits*: Coal-fields; lodes of Přibram, Freiberg, and Cornwall; Mass-deposits of Montchanin, Mokta-el-Hadid, Stahlberg, Saint-Pancré. Chap. iii. *Prospecting or Search for Minerals*: Various indications, geological structure, outcrops, &c. The rest of the work treats of boring, sinking, and mining generally. Artesian wells are described on pp. 89–96. W. T.

Collins, J. H. Principles of Coal Mining. Pp. 140, woodcuts. 8vo. *London and Glasgow*.

Cramer, H. Beiträge zur Geschichte des Bergbaues in der Provinz Brandenburg. Heft 4. Pp. 112. 8vo. *Halle*.

Dawkins, Prof. W. Boyd. On the Water Supply in the Red Rocks of Lancashire and Cheshire. *Trans. Manch. Geol. Soc.* vol. xiv. pt. vi. pp. 133–143.

Describes the Permian and Triassic sandstones as saturated with water, in such quantity that it has not been necessary to sink wells much below the sea-level. The Permian, from its varying thickness, is an uncertain source; but the New Red has a gross thickness of 1700 to 1900 feet, consisting of sandstones of various degrees of porosity. Considers that there is no evidence that faults are water-tight barriers, or that the quantity of water decreases in depth. Suggests that in the Triassic area of Lancashire and Cheshire there is a vast subterranean lake fed by subaërial wells. C. E. D.

Dunnachie, J. Fire-Bricks. *Iron*, n. s. vol. viii. p. 587. (*British Assoc.*)

Notes geological position and character of Scotch fire-clays.

Eassie, W. On the so-called Deposits of Onyx near Mexico; their History, and their Value as a Decorative Material. *Journ. Soc. Arts*, vol. xxiv. no. 1222, pp. 503–511.

Notices various stones used for decorative purposes. The Mexican stone is a marble (essentially carbonate of lime) of very many colours, and is said to be "of stalagmitic origin, formed by running water." A qualitative analysis is given. The quarry is at Tecali, 35 miles from the city of Mexico. The largest block yet shipped measured $10 \times 5 \times 4$ feet. W. W.

Easton, Edward. On the Yield of Wells sunk in the Chalk in the central portion of the London Basin. *Proc. Inst. Mech. Eng.* pp. 163–169, 3 pls. (2 Geological, 1 Rainfall and Level of Water in Wells), Discussion, pp. 169–176; and *Iron*, n. s. vol. vii. p. 585.

Discusses the disturbing causes influencing the flow of underground water, especially the fault (or faults) in the Thames valley E. of Deptford, and the fissures of the Chalk. Disturbing causes render the finding of water very uncertain. The flow of water through the Chalk to the wells at Brighton is described. Where wells are sunk through the Tertiary sand into the Chalk, a large part of the water in the wells comes from the sands—as is sometimes proved in the well itself, and at other times may be inferred from analyses. No very large quantity of water can now be obtained from the Chalk beneath London; additional supply for London must be looked for in outlying districts, where the Chalk comes to the surface. W. T.

Fenzl, Jelinek, v. Schroetter, Stefan, and **Suess.** Report of the Special Committee for the consideration of the memoir of **Hr. Hofrath G. Wex** upon the diminution of the water of Rivers and Streams. Translated in *Ann. Rep. Smithson. Inst.* pp. 198–204. (See notice of the original in the GEOLOGICAL RECORD for 1875, p. 205.)

Gamble, J. G. The Brighton Intercepting and Outfall Sewers. *Proc. Inst. Civ. Eng.* vol. xliii. pp. 191–203. (Discussion, pp. 204–224.)

Geology, p. 192; amount of water pumped from the Chalk, pp. 200, 201.

Geikie, Prof. A. Outlines of Field-Geology. With an Account of the Use of Surveying Instruments, and the Construction of Geological Maps. 8vo. *London.* Pp. 61.

Contains an explanation of maps, notes on the accoutrement of a field-geologist, character of field-work, preliminary traverses, determination of rocks and fossils, tracing of boundaries, determination of geological structure, construction of sections, &c. H. B. W.

Glinzer, Dr. E. Das Eisen, seine Gewinnung und Verwendung. Pp. vii, 106. 8vo. *Hamburg.*

Granström, G. A. Några underrättelser om grufvorna och grufdriften inom Norbergs Vergslag. [Mines and Mine-workings in the District of Norberg.] *Jernkontorets Annaler*, Arg. 31. *Stockholm.*

Harrington, B. J. Notes on the Iron Ores of Canada. *Iron*, n. s. vol. vii. pp. 9, 41, 70, 106. (Continued; see GEOLOGICAL RECORD for 1875, p. 121.)

Under the headings:—Bog Iron Ore; Spathic Iron Ore; Clay Ironstone; Province of Ontario; Province of Quebec, New Brunswick, and Nova Scotia; Clementsport; General Remarks. W. T.

Hayter, H. Holyhead New Harbour. *Proc. Inst. Civ. Eng.* vol. xliv. pp. 95–112. Discussion, pp. 113–130.

The stone employed was quartz-rock from Holyhead Mountain. The methods of working the stone are described, and the various parts of the quarries shown in woodcut plans and elevations. W. T.

Heatherington, A. The Gold Yield of Nova Scotia, 1861–75. Pp. 8. 8vo. *Halifax, N. S.*

Consists of annual statistics, showing that Nova Scotia is a gold region of importance.

Houghton, Jacob. The Ancient Copper Miners of Lake Superior. *Iron*, n. s. vol. viii. pp. 168, 199.

Hull, Prof. E. A Scheme of Water Supply for Villages, Hamlets, and Country Parishes of the Central and Eastern Counties. *Quart. Journ. Sci.* n. s. vol. vi. pp. 304–317; and *Rep. Brit. Assoc.* for 1875, *Sections*, pp. 249, 250.

Proposes to apply for this purpose the information published on the Geological Survey Maps. The permeable strata over the area in question have a thickness of from 1275 to 5600 feet; the impermeable strata of from 2110 to 5030 feet. The rocks described range from London Clay to Permian inclusive. The character of the water of each permeable bed is described, and the means of obtaining that water by wells discussed. W. T.

Humber, W. A Comprehensive Treatise on the Water Supply of Cities and Towns. Pp. xiv, 378; 32 plates, 257 woodcuts. 4to. *London.*

Chap. iv. Springs, and the Water-bearing formations of various districts (with geological sections). Chap. vi. On the Selection of Sources of Supply. Chap. vii. Wells (with geological sections). W. T.

Hunt, R. Mineral Statistics of the United Kingdom of Great Britain and Ireland for the year 1875. Pp. xv, 282. 8vo. *London.*

Huxham, Hort. On some Particulars of Boring with the Diamond Drill. *Proc. S. Wales Inst. Eng.* vol. ix. pp. 201–220.

Includes two tables:—1. Details of some borings in England, showing the progress through different strata, by Mather and Platt's boring machinery. 2. The results obtained in some of the bore-holes of the Diamond Rock-boring Company. R. B. N.

Jenkins, H. M. Report of the Agriculture of the Kingdom of Denmark. *Journ. R. Agric. Soc.* ser. 2, vol. xii. p. 307.
Map of Surface Geology. Physical features noticed pp. 319–322.

Kelb, Mich. Die Soolequellen von Galizien. [Salt-wells of Galicia.] *Jahrb. k.-k. geol. Reichs.* Bd. xxvi. Heft 2, pp. 135–208, tab. 7–14 (plans and sections).
Salt-works existed at one time or another in 209 localities in Galicia, and counted 385 shafts and 276 wells; of these a great number are abandoned. Particulars as to the yield, &c. of each are given in tables. Their chemical composition is compared with that of the Alpine salt-works and with sea water, the percentage of salts being graphically represented in a table. E. B. T.

Ker, D. The World's Future Coal-depôt. *Geogr. Mag.* vol. iii. pp. 60–63.
Treats of the coal-resources of China and Russia (see **Woeikof**, p. 199).

Kingzett, C. T. History, Products, and Processes of the Alkali Trade. *Iron*, n. s. vol. vii. pp. 578, 610.
Analyses and statistics of pyrites and nitre (later parts treat of manufacture).

Lencauchez, A. [Peat or Fuel for Industrial and Domestic Purposes.] *Ann. Génie Civil*, vol. xiii. p. 757. Abstract in *Proc. Inst. Civ. Eng.* vol. xliv. p. 289.
Chiefly relates to methods of working.

Molyneux, W. The Old River Courses, and the Recent Floods of the Trent Valley at Burton-on-Trent, with particulars of proposed works for the preservation of the Town from further Inundations. Pp. 19; plan and section. 8vo. *Burton-on-Trent.*
Floods do great damage to the district, and especially to the town; they obstruct the sewage-works and foul the wells. It is proposed to construct a series of embankments, taking advantage of the low terraces of old river-gravels. The flood-waters will then be confined to the E. side of the valley, and they can only affect the town by lateral percolation through the gravel. W. T.

Oxland, Dr. R. Mineral Resources of Devon and Cornwall. Earthy Minerals. *Trans. Plymouth Inst.* vol. v. pp. 196–204; part ii. pp. 485–493.
Water is considered under two heads—mechanical and chemical. Kaolin, refuse mica, and china-stone are noticed, and various stones enumerated. Part ii. contains remarks on the best way to improve the depressed conditions of the copper, tin, and iron markets. R. B. N.

Purnell, E. J. Description of the Coventry Waterworks. *Proc. Assoc. Municipal Eng.* vol. ii. pp. 156–158.
An account of the wells in New Red, with analysis of water.

Raymond, R. W. The World's Product of Silver. *Iron*, n. s. vol. vii. p. 132.
Gives the production in various countries, as estimated by different authors from 1800 to 1867.

Saward, F. E. The Coal Trade. *New York.*
Statistics of production for the chief countries of the world, but especially for the United States.

Schmidt, Dr. Adolf. Iron Manufacture in Missouri. A General Review of the Metallurgical Districts and their Resources. *Trans. Ac. Sc. St. Louis*, vol. iii. no. 3, pp. 261–272.
i. Eastern ore region, comprising 4 districts; ii. Central ore region; iii. Western ore region; iv. Southern ore region. These regions are described under the heads *Extent*, *Means of communication*, and *Resources and their development.* G. A. L.

Schwind, F. v. Eine neue Bauregel für die Salzberge. [New Rule for working Salt-Mines.] *Berg- Hütt. Jahrb.* Bd. xxiv. p. 299.
An investigation of the proper height to be given between the levels in mines that are worked by dissolving out the salt with a stream of fresh water, the conclusion being that water cannot easily exhaust a cone of ground more than 10 fathoms high. H. B.

Simms, F. W. Practical Tunnelling. Ed. 3. Revised by **D. K. Clark.** Plates. 8vo. *London.*
Geological notes on Bletchingley and Saltwood Tunnels in Kent. Notes on St. Gothard, Mont Cenis, and other tunnels, by the Editor.

Sola, F. A. Quicksilver. *Iron*, n. s. vol. viii. p. 712.
A description of Almaden Mine and works.

Stöhr, Em. Katechismus der Bergbaukunde. 48 woodcuts. *Vienna.*

Svedelius, G. T. f. bermästarens vid guldvaskerierna i finska Lappmarken till Bergsstyrelsen afgifna berättelse om guldletnings och vaskningsarbetet under år 1875. [Report on the Gold-digging and Gold-washing at Finlandic Gold-works in 1875.] Pp. 18. 8vo. *Helsingfors.*
From 1870 gold has been washed at the River Tvalojoki. Statistics of yield are given.

Tholander, H. Experimental Researches on the Reduction of Iron Ore, and on the effect of roasting upon Magnetites and Hæmatites. *Iron*, n. s. vol. viii. pp. 418, 482 [the parts before not geological].

Topley, W. Water Supply and Public Health. *Pop. Sci. Rev.* vol. xv. pp. 31–45.
Refers to the influence of agricultural drainage on springs and streams, hardness of water, yield of springs within the Thames Basin, &c.

Wahl, Dr. W. H. Infusorial Earth and its Uses. *Quart. Journ. Sci.* n. ser. vol. vi. pp. 336–351.

Notices the deposits of this earth in Europe and America. It is used as a polishing agent, as a poor conductor of heat, in the manufacture of dynamite, in making artificial stone, and in glazing pottery. W. W.

Wanklyn, J. A., and E. T. Chapman. Water Analysis: a practical treatise on the Examination of Potable Water. Ed. 4. Pp. x, 182. 8vo. *London.*

Part iii. pp. 121–140: Examples of complete mineral analyses; water supply to London, Manchester, Sunderland, Croydon, and Bonn.

Wigner, G. W. On the Water Supply of the Isle of Thanet. *Sanitary Record*, pp. 181, 182.

Analyses of water supplied in Ramsgate, Margate, Westgate, and Broadstairs.

Williams, James. Abstract of a notice on Mineral Lodes. *Trans. R. Geol. Soc. Cornwall*, vol. ix. p. 184.

Insists on the importance of working on the junctions of lodes.

Williams, W. M. Iron and Steel Manufacture. Lecture 1. *Journ. Soc. Arts*, vol. xxiv. no. 1234, p. 827.

Describes the various ores of iron (pp. 827–830), noting their localities.

Wosikof, A. The World's Future Coal Depôt. *Geogr. Mag.* vol. iii. p. 224.

Corrects some statements of Mr. Ker (see p. 197) as to the coal-resources of Russia.

Annuaire des Mines et de la Métallurgie Françaises, paraissant chaque année pendant le mois de mars. Pp. 408. 8vo. *Paris.*

British Manufacturing Industries. 8vo. *London.*

The following papers are in 2 vols., but the vols. are not numbered:—

Metallic Mining, by **W. W. Smyth**, pp. 1–50. Under the following heads:—Gold mines. Silver mines. Lead mines (1, of the limestone formations, generally poor in silver; 2, of the slaty rocks, often rich in silver; 3, in granite, variable as to silver, some very rich). Copper mines. Tin mines. Mines of zinc, antimony, and manganese. Iron mines.

Coal, by **A. Galletly**, pp. 51–96. Describes varieties of coal found in the coal-measures: 1. Anthracite; 2. Cannel coal; 3. Household coal (Caking, Cherry, and Splint Coal). Refers to the Brown Coal of Bovey Tracey, and to the distribution of coal-fields and their probable duration.

Working of Collieries, by **W. W. Smyth**, pp. 97–131.

Quarries and Building-Stones, by **Prof. E. Hull**, pp. 132–156. Mineral characters of the building-stones in their natural state. Geological position and enumeration of the principal quarries. Examples and illustrations of their use. Quotes analyses and experiments on some of the chief building-stones.

Iron, by **W. M. Williams**, pp. 1–47. Describes the conditions under which the iron ores occur.

Copper, by **J. A. Phillips**, pp. 77–121. Refers to the chief copper-minerals. Analyses given.

Tin, Tin Plate, and Tin Alloys, by **Walter Graham**, pp. 155–172. Considers the properties of tin and its manner of occurrence in the rocks. A table shows the development of our tin mines from 1818 to 1871.

Zinc, by **W. Graham**, pp. 173–181. The ores described, with analyses.

R. B. N.

Production der Bergwerke und Salzgewinnung aus wässeriger Lösung (Salinen) im Preussischen Staate für das Jahr 1875. [Mineral Produce of Prussian States in 1875.] *Zeitsch. Berg-, Hütt. Salinenw.* Bd. xxiv. Statist. Theil, p. 21.

Reports of the Inspectors of Mines for the year 1875. Pp. xxvii, 416. Fol. *London.*

See also :—

Foote, R. B. South Mahratta Country. (Chap. on economic geology): p. 149.

Mallet, F. R. Coal-fields of the Naga Hills, Assam : p. 150.

Prestwich, Prof. J. Water Supply of Oxford : p. 31.

Williams, J. J. Mineral Resources of Flintshire and Denbighshire : p. 40.

[Many papers that refer to the practical application of geology, and to the occurrence of coal, metalliferous ores, &c., are noticed under STRATIGRAPHICAL GEOLOGY.]

PETROLOGY.

Allport, S. On the Metamorphic Rocks surrounding the Land's End Mass of Granite. *Quart. Journ. Geol. Soc.* vol. xxxii. pp. 407–427, pl. xxiii.

Describes first some of the slates metamorphosed by contact with granite. These are changed into tourmaline-schist and mica-schist—new minerals, such as quartz, tourmaline, and three varieties of mica, resulting from the metamorphism, with a foliated texture and a concretionary action tending to segregate the quartz and mica, and produce a spotted schist. Then describes a number of altered dolerites; in these the pyroxenic constituent is replaced by actinolite and hornblende, in belonites, blades, and flakes. Many of the altered dolerites exhibit an imperfect cleavage. Calls attention to the possibility of some hornblende-schists being really altered doleritic rocks or diorites. The granite of Cornwall and Devon is an eruptive, not a metamorphic, rock. There is evidence to show that the Cornish rocks were cleaved and sometimes contorted before the granites were intruded. T. G. B.

Anon. Excursion to Antrim and Tardree. *Proc. Belfast Field Club*, ser. 2, vol. i. pp. 155–160.

Tardree Mountain trachyte-porphyry (Eocene) is coarsely crystalline, grey to white. Crystals of quartz and felspar in felspathic base.

Berwerth, Dr. Friedrich. Felsarten aus der Gegend von Rosignano und Castellina Maritima südlich von Pisa. [Rocks from S. of Pisa.] *Min. Mitth.* Heft iv. pp. 229–240, with woodcut.

The rocks described are diabase, gabbro, serpentine, and serpentine-rock (*Serpentingestein*). The last is composed of serpentine, diallage, and magnetite, with microscopic granules of calcite and particles of iron-glance. It may be regarded as a serpentine containing diallage; but as the diallage is fresh, and forms from $\frac{1}{4}$ to $\frac{1}{3}$ of the mass, the author prefers regarding it as a distinct rock. In some specimens the alteration of diallage to serpentine may be traced. No olivine was detected. F. W. R.

Bonney, Rev. T. G. On Columnar, Fissile, and Spheroidal Structure. *Quart. Journ. Geol. Soc.* vol. xxxii. pp. 140–154.

After briefly noticing columnar structure, in explanation of which the author accepts the contraction theory, he describes fissile, tabular, curvitabular, cup-and-ball, and spheroidal structure, giving numerous examples. The last is considered in detail, is shown to exist in rocks other than igneous, and to be identical with the perlitic structure of

obsidian, &c. All these structures are shown to be the result of contraction. T. G. B.

Bořický, Dr. Em. Petrographische Studien an den Melaphyrgesteinen Böhmens. [Bohemian Melaphyres.] *Arch. nat. Land. Böhm.* Bd. iii. Abth. 2, Heft 2, pp. 1–84; 2 chromo. pls.

Hornblende is almost entirely absent in the Bohemian melaphyres, while orthoclase is sometimes equal in amount to the plagioclase. The felspars are the predominant constituent, seldom falling below 50 p. c.; this distinguishes them from the felspar-basalts, where augite is the chief element. Examples are grouped first according to the proportions of mono- or triclinic felspar, and subdivided by their richness or poverty in augite, &c. Chemical analyses are adduced to supplement the optical; and thereby their composition is arrived at: *e.g.* the Trosky rock contains—andesine 55 p. c., augite 13, magnetite 10, olivine 3, apatite 1, silica, alumina, &c. 18 p. c. Chapters on secondary minerals, &c. follow. E. B. T.

Bouvé, Th. T. On the origin of Porphyry. *Proc. Boston Soc. Nat. Hist.* vol. xviii. p. 217.

Bruton, J. B. Testing for Water in Coals. *Iron*, n. s. vol. viii. p. 328. (*Amer. Inst. Min. Eng.*)

Describes methods of analyses, and the amount of water found in various samples.

Calderon, Salvador. Reseña de las Rocas de la Isla Volcánica Gran Canaria. [Rocks of the Volcanic Island of Grand Canary.] Pp. 33. 8vo. *Madrid.*

The same as the paper noticed in the Geological Record for 1875, p. 144.

Cavazzi, A. Puzzuolana of St. Paul in Rome, and that of Maremma in Tuscany. *Ing. Civ. Arti Indust.* vol. xxiv. p. 50. (Abstract in *Proc. Inst. Civ. Eng.* vol. xlvi. pp. 363–365.)

Analyses given.

Cohen, Dr. E. Vorläufige Notiz über ein massenhaftes Vorkommen basischer Gesteinsgläser. [Vitreous basic Rocks in Mass.] *N. Jahrb.* Heft vii. pp. 744–747.

A description of several lavas from the Sandwich Islands, which are believed to occur in mass, and not subordinately as enclosures or as salbands. They are basic, containing about 53 p. c. of silica, and are in part very vesicular. They consist of an apolar vitreous matrix, with crystals of plagioclase, augite, and olivine; associated in some specimens with concretionary structures, which present an opaque nucleus surrounded by a translucent fibrous anisotropic rind. F. W. R.

——. Ueber die sogenannten Hypersthenite von Palma. [The so-called Hypersthenites of Palma.] *N. Jahrb.* Heft vii. pp. 747–752.

W. Reiss described some hypersthenites occurring with diabase in the Island of Palma, where they form a lower or diabase-group partly overlain by a younger or lava-formation. These so-called hypersthenites contain no hypersthene, but are in different specimens diabase, diorite, and syenite. F. W. R.

Collins, J. H. On the China Clay and China Stone of Devon and Cornwall. *Journ. Soc. Arts*, vol. xxiv. no. 1224, pp. 565–572.

A bibliography of the subject given; the modes of occurrence and of working described; and the uses of the clay and of *débris* noticed. The decomposed parts of the granite are associated with veins of tourmaline and other minerals containing fluorine; and the author thinks that the decomposition has been caused by fluorine, &c., coming up from below, not by carbonic acid and water from above. Decomposition is more general at the junction of granite with other rocks than elsewhere. The clay-rock is mostly covered by a layer of stones, sand, or impure clay, up to 40 feet thick. Decomposed granite is found at all levels but the highest points. W. W.

Cossa, Prof. Alfonso. Ricerche di Chimica Mineralogica sulla Sienite del Biellese. [Chemico-mineralogical Examination of the Syenite of the Biellese.] *Mem. R. Ac. Sci. Torino*, ser. 2, t. xxviii. pp. 309–337.

Gives density, analysis, and crystallographic description of the orthoclase and hornblende, a general analysis of the syenite, and the result of the action on it of chemical solutions. W. H. D.

Dathe, Dr. E. Olivinfels, Serpentine und Eklogite des sächsischen Granulitgebietes. Ein Beitrag zur Petrographie. [Olivine-rock, Serpentine, and Eclogite of the Granulite District of Saxony.] *N. Jahrb.* Heft iii. pp. 225–249; Heft iv. pp. 337–351.

An inquiry into the origin of the Saxon serpentine. Olivine-rock has been found in three places: at Heiersdorf and Mohsdorf it is a garnet-olivine-rock, while at Russdorf it is an enstatite-bearing variety; each occurrence is described in detail. Two varieties of Saxon serpentine are recognized, and their occurrence described; one is characterized by the presence of garnet, the other by that of a mineral belonging to the enstatite group. Believes that the garnet-serpentine has been derived from the garnetiferous variety of olivine-rock, while the bronzite-serpentine is referred to the alteration of the enstatite-rock. Describes the occurrence of eclogite, and discusses its relations with serpentine. Concludes, however, that eclogite has not contributed to the formation of serpentine in the district. F. W. R.

Daubrée, Prof. —. Observations sur un nouvel exemple des décompositions chimiques qui s'opèrent journellement dans les silicates, notamment dans le feldspath. [New Instance of the Chemical Decomposition daily taking place in Silicates, especially in Felspar.] *Bull. Soc. Agric. France*, t. xxxvi. p. 568.

Dawson, Dr. J. W. Notes on the Phosphates of the Laurentian and Cambrian Rocks of Canada. *Quart. Journ. Geol. Soc.* vol. xxxii. pp. 285–291.

Names Lower Silurian horizons yielding phosphatic nodules of coprolitic origin, probably derived from animal food. Describes Laurentian apatite, also regarded as of coprolitic origin. W. H. D.

Doelter, Dr. C. Die Bestimmung der petrographisch wichtigeren Mineralien durch das Mikroscop, eine Anleitung zur mikroskopischen Gesteinsanalyse. [Determination of Minerals by the Microscope.] Pp. 36. 8vo. *Vienna.*

An elementary sketch of the method of observing thin sections, *e. g.* with polarized light, and of the determination of minerals by their optical properties, combined with the outline of their sections, form of twinning, enclosures, &c. Lists of uni- and bi-axal crystals are given, and 5 tables of detailed application of the above means for the detection of the commoner mineral constituents in thin rock-slices. E. B. T.

Doelter, Dr. C., and **R. Hoernes.** Osservazioni chimico-genetiche sulle Dolomiti del Tirolo Meridionale. [Chemico-genetic Observations on the S. Tyrol Dolomites.] *Boll. R. Com. geol. Ital.* vii. pp. 41–51. Translation of the paper noticed in the Geological Record for 1875, p. 210.

Douville, H. Les études lithologiques en France. [Lithologic Studies in France.] *Rev. Sci.* x. pp. 377–381.

Notice of recent researches on the microscopic structure of rocks in France. Adopts the theory that the texture is in immediate relation with the age of rocks; thus the acid rocks in order of appearance are crystalline or granitoid, compact or lithoid (porphyries, &c.), vitreous or retinoid; these are further divided. E. B. T.

Duvillier, —. Analyse des nodules des schistes du Dévonien supérieur de Glageon (Schistes de Frasne). [Analysis of Nodules from the U. Devonian Schists of Glageon (Frasne Schists).] *Ann. Soc. Géol. Nord,* t. iii. p. 33.

Egleston, Dr. T. Refractory Materials. *Iron,* n. s. vol. viii. pp. 297, 431, 486. (*Amer. Inst. Min. Eng.*)

A description of fire-clay, gannister, &c.

Ferretti, Ant. Considerazioni sui prodotti minerali del territorio di Scandiano. [Mineral Products of Scandiano.] *Boll. R. Com. geol. Ital.* vii. pp. 132–139, 218–223.

Notes on hydraulic limestone, sulphur, manganese, ruin-marble, &c. found in the district.

Fouqué, —. Détermination des minéraux microscopiques des roches. [Microscopical Analysis of Rocks.] *Rev. Sci.* t. xi. pp. 589–596.

Elementary instructions for determining minerals in thin rock-sections, the different appearance under polarized light, according to the crystalline system, giving the most important aid. E. B. T.

Frazer, Prof. P. A Study of the Igneous Rocks. *Iron*, n. s. vol. viii. p. 747. (*Amer. Inst. Min. Eng.*)
Describes the methods of study.

Garrigou, Dr. Étude d'un Ciment Métamorphosé par la Source Bayen de Luchon. [Cement altered by the Mineral Waters of Bagnères de Luchon (Pyrenees).] *Compt. Rend. Assoc. Franç.* 1875, pp. 677–679.
Analyses of the altered and unaltered cement.

Gasparin, P. de. Sur la formation du sol arable dans les terrains granitiques. [Formation of Arable Soil on Granites.] *Bull. Soc. Agric. France*, t. xxxvi. p. 523.

Geinitz, Dr. Eugen. Ueber einige Grünschiefer des sächsischen Erzgebirges. [Green Slates of the Saxon Erzgebirge.] *Min. Mitth.* Heft iv. pp. 189–206.
Detailed description of the so-called green slates, which occur, associated with phyllites, in the Muldenthal between Aue and Stein, and also near Tharandt and Herzogswalda. The "hornblende green-slates" consist of hornblende, epidote, titanite, quartz, orthoclase, plagioclase, and sometimes chlorite. In the "chlorite green-slates" the hornblende is replaced by primary chlorite. Sahlite is present in some of the hornblende varieties. F. W. R.

Gilmore, Col. Report on the compressive strength and specific gravity of the building stones in the United States in most general use. In the *Annual Report of the Chief of Engineers to the Secretary of War, for the year* 1875.

Gooch, Frank A. Ueber vulkanische Gesteine der Galapagos-Inseln. [Volcanic Rocks of the Galapagos Islands.] *Min. Mitth.* Heft ii. pp. 133–140.
Describes the microscopic characters of some lavas from the Galapagos Archipelago. A limestone-breccia, containing fragments of altered lava, shows the formation of glauconite or a similar substance; and it is argued that this mineral and similar silicates may be regarded as products of the decomposition of volcanic minerals, even when occurring in sedimentary rocks like the glauconite-bearing Cretaceous beds. F. W. R.

——. Bemerkungen über die Pechsteine von Arran. [Pitchstones of Arran.] *Min. Mitth.* Heft iii. pp. 185, 186.
Sections of pitchstone from Lamlash and Clachland Point contain belonites which exhibit dichroism, and which are therefore referred to hornblende. F. W. R.

Green, W. L. On a Probable Origin for many Magnesian Limestones and Dolomites, for the Serpentine Streaks in Verde Antique Marble, and for the Serpentine found in *Eozoön Canadense* and other Limestone Fossils. *Journ. R. Geol. Soc. Ireland,* ser. 2, vol. iv. pt. 3, pp. 140–143.

The lava of the Hawaiian group of islands is a basic variety containing much olivine; and when it is broken up by the sea a large quantity of olivine-sand is formed. A mixture of this with coral-sand is common over the group, extending 400 miles. The olivine-sand also penetrates into the pores of the coral-reef rock. Such mixtures might give rise by metamorphism to serpentines, verde antiques, and dolomites; and ancient rocks of these classes may have been so formed. The olivine-sand might penetrate organic matter, and so lead to mineralization, such as in *Eozoön*. Suggests that the red clays and manganiferous muds of the Pacific are a residue from lavas and volcanic dust. E. T. H.

Gümbel, Dr. C. W. Variolit von Berneck im Fichtelgebirge. [Variolite from Berneck in the Fichtelgebirge.] *N. Jahrb.* Heft i. pp. 42, 43.

Asserts the relation of this rock to diabase, against the views of Zirkel.

Guyerdet, A. Analyse et Examen du Dépôt laissé par les dernières Inondations de la Garonne au Faubourg Saint-Cyprien à Toulouse. [Analysis of Flood-mud of the Garonne at Toulouse.] *Compt. Rend. Assoc. Franç.* pp. 577–581.

5 other analyses of river-mud are quoted for comparison.

Hardman, E. T. On the Origin of Anthracite: with Suggestions as to the possible Correlation in Time and Manner of Production of the Anthracites of Southern Ireland, Wales, Devonshire, and France. *Journ. R. Geol. Soc. Ireland,* ser. 2, vol. iv. pt. 3, pp. 200–209.

There are two theories of the origin of anthracite—that it is due to crumpling of strata, and that it is caused by plutonic influences. The author maintains the latter. After glancing at the chemistry of the process by which woody matter may gradually change into anthracite or even graphite, it is pointed out that this will not account for the partial alteration of beds of coal in the same coal-field, and subject to the same conditions. Such alteration cannot be ascribed to flexuring; for contorted anthracitic coal-fields are rare, whilst many bituminous coal-districts are highly disturbed. In most coal-districts there is evidence of an outburst of igneous rock of later date than the coal, sufficiently near, either to visibly effect the alteration, or of such extent that hidden masses may have approached close enough to the Coal Measures to have driven off the volatile matter. All the immediate coal-fields N.E. of a line through the semibituminous coal of Leitrim and

S. Wales, prolonged S.E. into France, are bituminous, while those S.W. are anthracitic; and not only this, but the coals are more altered towards the S.W. in the direction of the lateral extension of the granite of Cornwall. The granites of Dartmoor (which has certainly altered the Culm Measures) and Lundy Island, and perhaps some of those of the N.E. of France, are possibly only partial exposures of a subterranean axis, extending along the line referred to, and which, penetrating at intervals near the Coal Measures, may have developed sufficient heat to drive off some of the gaseous matter. In this way the anthracite and steam coal of Leinster and Leitrim might have been formed. E. T. H.

Hardman, E. T. Analyses of Coals and Ironstones from the Dungannon Coal-Field, Co. Tyrone. *Proc. R. Irish Acad.* ser. 2, vol. ii. no. 6, pp. 529–538.

8 analyses of coals and 5 of ironstones. The coals are of good quality, highly bituminous, and well suited for gas-making. There are 2 seams of cannel, one equal to the best Lesmahagow coal. The heating power of all is very high. The ironstones are of average composition, but as yet of no importance. A well-marked point is the complete agreement between the specific gravities and the proportion of ash, a matter that has been disputed; but this relation holds, not only in respect of these coals, but of most others; and an approximate idea of the amount of ash of a coal may be had from its specific gravity.

E. T. H.

Haughton, Rev. Prof. Samuel, and **Prof. Edward Hull.** Report on the Chemical, Mineralogical, and Microscopic Characters of the Lavas of Vesuvius from 1631 to 1868. *Trans. R. Irish Acad.* vol. xxvi. pt. iii. *Science*, pp. 49–164, plate.

Part I. On the Chemical and Mineralogical Composition of the Lavas of Vesuvius. By **Rev. S. Haughton.** The collection made by Prof. Guiscardi consists of 20 specimens, of which the chemical analyses are given. From these, and microscopic determination of the minerals, the percentage of the latter constituent is obtained from a series of indeterminate equations, and by the aid of the principle that, "Of the numerous possible solutions, that one will occur in Nature which involves the largest amount of Definite Minerals and the least amount of Indefinite Paste.' An Appendix, by **William Early,** gives the methods adopted in the chemical analysis.

Part II. On the Microscopical Characters of the Lavas. By **Prof. Hull.** The lavas are rich in leucite and allied minerals. The specimens exhibit a remarkable uniformity of structure; and the essential and distinctive minerals are leucite and augite; hence they are leucite-basalt. In certain cases some of the accessory minerals become rather abundant, as sanidine, in many specimens, when the lava becomes a sanidine-leucite-rock: these are more highly silicated varieties. Augite, although still an essential, becomes less abundant in the more recent specimens. Altogether 16 minerals are observed—leucite, nepheline,

sodalite, augite, plagioclase, sanidine, hornblende, olivine, mica, quartz, meionite, vesuvian, sulphur, apatite, titano-ferrite, and hatite. E. T. H.

Hawes, George W. Contributions from the Sheffield Laboratory of Yale College.—No. xxxvii. The Rocks of the "Chloritic formation" on the Western Border of the New Haven region. *Amer. Journ.* ser. 3, vol. xii. pp. 122–126.

Gives analyses of the trap-like massive metamorphic rocks of this formation (see **Dana**, p. 131), under the names metadoleryte, metadiabase, and metamelaphyre, the prefix "meta" indicating the metamorphic origin of the rock; and compares them with the corresponding igneous rocks, with which they closely agree. G. A. L.

Hunt, Dr. T. S. The decayed Gneiss of Hoosac Mountain. *Proc. Boston Soc. Nat. Hist.* vol. xviii. p. 106.

——. Prof. J. D. Dana on the Alteration of Rocks. *Proc. Boston Soc. Nat. Hist.* vol. xviii. p. 108.

Kalkowsky, Ernst. Über grüne Schiefer Niederschlesiens. [Green Slates of L. Silesia.] *Min. Mitth.* Heft ii. pp. 87–116.

N. of the valley of the Bober, near Hirschberg, at the foot of the Riesengebirge, is a mountain consisting of clay-slate and of certain rocks, which G. Rose described as "green slates." These have been petrographically examined. The principal mass of the true green slates consists of orthoclase, hornblende, and iron-ore, with quartz, plagioclase, calcite, and augite as subordinate constituents. The hornblende is more or less altered to chlorite and epidote. The "chloritic green slates" consist of chlorite (primary, not secondary), quartz, orthoclase, hornblende, and epidote or iron-glance, and microlites. No calcite or augite; the hornblende is but rarely decomposed. F. W. R.

——. [Diabase-porphyry of the Tannebergsthal.] *N. Jahrb.* Heft vi. pp. 623–626.

Reply to Vom Rath's strictures on a former communication (see *post*). Maintains that the Tannebergsthal rock is a diabase-porphyry and not a basalt. F. W. R.

——. Ueber einige Eruptivgesteine des sächsischen Erzgebirges. [Eruptive Rocks of the Saxon Erzgebirge.] *N. Jahrb.* Heft ii. pp. 136–161.

Describes the syenites of Scharfenstein and the neighbourhood; a compact micaceous diorite, or kersantite, from the Tannebergsthal in Voigtland; and the mica-porphyrite of Flöha. F. W. R.

Kinahan, G. H. On the Classification and Nomenclature of Rocks. *Geol. Mag.* dec. ii. vol. iii. pp. 114–117.

Igneous rocks should be classed according to their age. Nevadite would be a good name for elvanites and passage-rocks between tra-

chytes and granites. Plutonic rocks are not necessarily connected with volcanic eruptions, though volcanic rocks must be connected with plutonic masses. Owing to imperceptible gradations, the division into acid and basic is found unsatisfactory in the field. W. H. D.

King, Prof. W., and **Prof. T. H. Rowney.** On the Serpentinite of the Lizard—its original Rock-condition, Methylotic Phenomena, and Structural Simulations of Organisms. *Phil. Mag.* ser. 5, vol. i. pp. 280–293, plate ii.

Regard the serpentine as the result of metamorphism, in some cases of an igneous, in others of a metamorphic rock. The included crystals are pseudomorphs after pyroxene; associated chrysotile, calcite, or dolomite are rare, especially the last two. Call attention to various microscopic structures which are considered to simulate organisms, such as foraminifera and corals. T. G. B.

Klunge, A., and **M. de Tribolet.** Études Géologiques et Chimiques sur quelques gisements de calcaires hydrauliques de l'Oxfordien et de l'Astartien du Jura Neuchâtelois et Vaudois. [Oxfordian and Astartian Hydraulic Limestones of the Neuchâtelese and Vaudois Jura.] *Bull. Soc. Vaud. Sci. Nat.* ser. 2, t. xiv. pp. 65–90. [See **Tribolet**, Geological Record for 1874, p. 103, and 1875, p. 397.]

Many analyses (by **Klunge, Kern, Mathey, Brelaz,** and **Bonjour**) of limestones, generally both before and after calcination.

Knop, A. Der vulkanische Kaiserstuhl im Breisgau. [The Kaiserstuhl in Breisgau.] *N. Jahrb.* Heft vii. pp. 756–760.

This hill represents an old submarine volcano, and consists mainly of dolerites, some peculiarly rich in olivine, forming the variety *Limburgite*. Phonolite occurs in dykes, and is sometimes marked by large crystals of sanidine (sanidine-phonolite), or by hauyne (hauyne-phonolite), or by leucite (leucite-phonolite). True trachytes are not found; and the author believes that Neis's rock "*sanidinite*" was founded on loose transported blocks. Titanic acid is found in many of the rocks and minerals of the Kaiserstuhl; thus limburgite yielded 4·33 p. c. A full description of analytical methods for separating titanic acid is given. F. W. R.

Lagorio, A. Microscopische Analyse ostbaltischer Gebirgsarten. [Microscopical Analysis of E. Baltic Rocks.] *Arch. Nat. Liv- Ehst- Kurlands*, ser. 1, Bd. viii. Heft ii. pp. 145–299, pls. i.–v.

Description of limestone, serpentine, massive crystalline rocks, schists, and clastic rocks.

Lasaulx, A. von. [Rocks from near Trèves.] *N. Jahrb.* Heft ii. pp. 175–178.

Notices of porphyry from near Gottesberg, and of the diorite of Kürenz. The porphyry is nearly snow-white, almost destitute of quartz, and decomposes with great ease. The diorite contains horn-

blende and augite intimately associated, and passing into a substance like uralite; whilst the altered diorite also contains calcite and a mineral resembling serpentine. F. W. R.

Laufer, E. Die Quarz-Porphyre der Umgegend von Ilmenau. [Quartz-porphyries of Ilmenau.] *Zeitsch. deutsch. geol. Ges.* Bd. xxviii. Heft 1, pp. 22–48.

Gives descriptions and analyses of 21 porphyries from the district, grouped under quartz-porphyries, or those with distinct quartz-crystals, and felsite-porphyries, in which no quartz is visible to the eye, but whose paste contains more silica than is present in felspar; indeed the quartz is often visible in the microscope. They are chiefly of Rothliegende age, though not necessarily synchronous; *e. g.* the Hermannstein porphyry seems to cut through that of Kickelhahn. None contain titanic acid, though this is often present in the porphyrites. There are veins with fluor, barytes, and manganese; but these are later introductions. E. B. T.

Luedecke, Otto. Der Glaukophan und die Glaukophan führenden Gesteine der Insel Syra. [Glaucophane-rocks of Syra Island.] *Zeitsch. deutsch. geol. Ges.* Bd. xxviii. Heft 2, pp. 248–292, pl. 7.

The microscopic structure and chemical composition of glaucophane, omphacite, &c. are investigated, and the same methods extended to many varieties of rocks occurring in the island. Among these are described glaucophane-eclogite, omphacite-paragonite-rock, glaucophane-epidote-rock, omphacite-zoisite-gabbro, smaragdite-chlorite-rock, &c. E. B. T.

Malherbe, Renier. De l'analyse des Charbons. [Coal analysis.] 8vo. *Liége.*

Mello, Rev. J. M. A Chapter in the History of Rock Structure. *Sci. Goss.* No. 137, pp. 101–103, woodcuts.

Illustrates the mineral and microscopic examination of rocks by means of a specimen of granite.

Morgan, Alfred. A Note on Itacolumyte, or flexible Sandstone. *Proc. Liverpool Geol. Soc.* vol. iii. pt. ii. pp. 148–151.

Occurs in Brazil and S. Carolina as a micaceous granular quartz-rock, said to be associated with gold and topaz. In India, at Kaliana, 60 miles west of Delhi, are patches in a band of earthy cellular quartzite, used for millstones, sometimes in the line of bedding, sometimes in the lines of joints, probably due to the removal of cementing material by water, the particles being imbedded in a paste permitting motion. C. E. D.

Moss, —. A Section of Quartz-rock from Shankill, Co. Dublin, exhibited at the Dublin Microscopical Club. *Quart. Journ. Micr. Sci.* vol. xvi. p. 415.

The rock was said to be a sandstone, consisting of rounded grains of

quartz, with a siliceous cement. The specimen contained many irregular opaque specks, apparently ferruginous, as analysis showed the presence of iron. E. T. N.

Muck, F. Chemische Beiträge zur Kenntniss der Steinkohlen. [Chemical Contributions on Coals.] Pp. 40. *Bonn.*

Neminar, Dr. E. F. Die Eruptivgesteine der Gegend von Banow in Mähren. [Eruptive Rocks of Banow, Moravia.] *Min. Mitth.* Heft iii. pp. 143–156.

A microscopic and chemical description of hornblende-andesites, augite-andesites, and felspar-basalts. Many of these, even when fresh, contain minerals of secondary formation, such as calcite, siderite, pyrites, limonite, &c., the origin of which is referred to the neighbouring rocks. F. W. R.

Öberg, K. V. Analyser af Svenska dioriter. [Analyses of Swedish Diorites.] *Academical Treatise.* Pp. 26. 8vo. *Upsala.* Abstract in *Geol. Fören. Stockholm Förh.* Bd. iii. pp. 188–191.

14 analyses given, with the method of analysis.

Pettersen, Karl. [Eukrite.] *N. Jahrb.* Heft ii. p. 174.

The beautiful rock *Eukrite* occurs in large masses on the island of Seiland, S. of Hammerfest.

——. [Enstatite Gneiss.] *N. Jahrb.* Heft v. pp. 515, 516.

Fragments of an almost pure enstatite gneiss were found at a great height on the Slunkas Berg in Nordland, Sweden. It is hard to account for their presence. Suggests the bare possibility of their meteoric origin. F. W. R.

Phillips, J. A. On the so-called "Greenstones" of Western Cornwall. *Quart. Journ. Geol. Soc.* vol. xxxii. pp. 155–178.

Gives results of microscopic and chemical analyses of the so-called greenstones of the Penzance district; concludes that they belong principally to three classes:—1. Gabbros or dolerites, in which the original minerals are to a great extent unchanged, but are sometimes almost wholly replaced by pseudomorphs; 2. Ordinary clay-shales (killas); 3. Highly basic hornblendic rocks, fissile, and presenting microscopically the characteristic appearance of metamorphic shales. Most of the greenstones of the Cape Cornwall district are hornblendic slates. The slaty and doleritic rocks of St. Ives and Gurnard's Head resemble those of Mount's Bay. The hornblende slates contain about 10 p. c. less silica than the crystallized pyroxenic rocks. T. G. B.

Phipson, Dr. T. L. On the Tripolite of Barbadoes. *Chem. News,* vol. xxxiv. no. 876, p. 108.

Contains original analyses of tripolite from Barbadoes and from

Dagesfors, Sweden. Names the principal genera of microscopic organisms which these deposits contain. F. W. R.

Pond, J. A. Analyses of a Few of the Fire-Clays of the Province of Auckland. *Trans. N. Zealand Inst.* vol. viii. p. 348.

Six analyses, with remarks.

Poussin, Ch. de la V., and **A. Renard.** Mémoire sur les Caractères Minéralogiques et Stratigraphiques des Roches dites Plutoniennes de la Belgique et le l'Ardenne Française. [Mineralogical Characters of the so-called Plutonic Rocks of Belgium and the Ardennes.] Pp. 264; 9 plates. 4to.

Describe the petrography and microscopic structure of the quartzose diorite of Quenast and Champ St.-Veron, of the gabbro of Hozémont and Grand Pré, of the quartz-porphyry of Spa, and of a number of rocks with a general resemblance to felstones, more or less schistose in structure, named "porphyroids." These rocks are shown to be of clastic origin, though often very greatly altered. Details of their mode of occurrence and of their microscopic structure are given, as well as those of some hornblendic rocks of like origin. T. G. B.

——, ——. Ueber die Feldspath- und Hornblende-Gesteine der französischen Ardennen. [Felspar- and Hornblende-rocks of Ardennes.] *Zeitsch. deutsch. geol. Ges.* Bd. xxviii. Heft 4, pp. 750–774, pl. xi. (map) and 6 cuts.

Partly a translation from the original memoir, with a supplement in answer to certain criticisms by Rothpletz.

Rath, G. vom. Das Syenitgebirge von Ditro und das Trachytgebirge Hargitta. [Syenitic Mountains of Ditro, and the Trachytic Mountains of Hargitta, near Büdösch, E. Transylvania; with Observations on the Auriferous Districts of Vöröspatale and Nagyag.] Pp. 55. 8vo. *Bonn.*

Describes *Miascite* (nepheline-syenite) and *Ditroite* (sodalite-syenite). Gives analyses of andesite and particulars of the auriferous rocks. W. H. D.

——. [Basalt-dyke in the Saxon Voigtland.] *N. Jahrb.* Heft iv. pp. 400–402.

Reply to Kalkowsky's criticisms (see p. 208). Holds that the rock which occurs as a dyke near Tannenbergsthal is a basalt modified by contact with the neighbouring rocks, and not a diabase-porphyry. F. W. R.

——. [The Topaz-rock of Schneckenstein.] *N. Jahrb.* Heft viii. pp. 855, 856.

Describes a visit to the quarries in this rock, and refers again to the Tannenbergsthal rock.

Renard, A. Sur la structure et la composition mineralogique du coticule, et sur ses rapports avec le phyllade oligistifère. [Structure

of Coticule, &c.] Reports by MM. de Koninck and Malaise on the above paper. *Bull. Ac. R. Belg.* ser. 2, t. xlii. nos. 9, 10.

Gives a sketch of the author's views of this rock, which is used for whetstones. It contains a micaceous mineral allied to damourite, garnet, tourmaline, and many other microliths. T. G. B.

Renard, A. Some Results of a Microscopical Study of the Belgian Plutonic Rocks. *Micr. Journ.* vol. xv. pp. 212–218; plate.

Attention is paid more especially to the fluid-cavities and their contents, with a view to the determination of the temperature and pressure under which the rocks were formed. E. T. N.

Rodriguez, F. Q. y. [Ophite of Pando, in Santander.] *Ann. Soc. Españ. Hist. Nat.*

The rock, of supposed Triassic age, contains a mineral intermediate between augite and diallage. C. E. D.

Roemer, Ferd. Ueber ein Vorkommen von Blitzröhren oder Fulguriten bei Starczynow unweit Olkusz im Königreiche Polen. [Occurrence of Fulgurites at Starczynow, near Olkusz, Poland.] *N. Jahrb.* Heft i. pp. 33–40, woodcut.

In a broad waste of sand S.W. of Olkusz many fulgurites were found; the relative positions of 24 are marked on a plan. The tubes vary in shape, their sections being round, angular, or compressed laterally. In those tubes which are about the thickness of the finger the walls are only from 1 to 2 mm. thick; in larger tubes the walls are thicker. The longest tube which has been dug out of the sand measures 2·19 metres. The sand is the common white quartzose sand of the N. German diluvial plain. The tubes may have been formed by lightning at very different dates, as the vitreous material of their walls would not be readily altered. F. W. R.

Rosenbusch, H. Einige Mittheilungen über Zusammensetzung und Structur granitischer Gesteine. [Structure of Granitic Rocks.] *Zeitsch. deutsch. geol. Ges.* Bd. xxviii. Heft 2, pp. 369–390.

Classes granites under:—1. Muscovite granite; 2. Granitite, where the mica is biotite; 3. Hornblende-granite, where there is hornblende instead of mica; 4. Granite proper, with potash- and magnesia-mica; 5. Hornblendic granitite, with hornblende and biotite. Notes the presence of augite in granitite-dykes and in granite-porphyry veins, aschaffite, &c., but not in Muscovite granite. Adopts Vogelsang's name of "Granophyre" for rocks intermediate between granite and quartz-porphyry, a complete passage being found between the two; such occur in veins chiefly; the microscopic appearance is described and examples given. E. B. T.

Roth, J. Ueber eine neue Berechnung der Quantitäten der Gemengtheile in den Vesuvlaven. *Zeitsch. deutsch. geol. Ges.* Bd. xxviii. Heft 3, pp. 439–444.

Note on Prof. Haughton's calculations of the proportions of consti-

tuent minerals in lavas of Vesuvius (see p. 207). Doubts the sufficiency of the method. E. B. T.

Roth, J. Ueber die Wirkung verdünnter Essigsäure auf dolomitische Kalke. [Action of Dilute Acetic Acid on Dolomitic Limestone.] *Min. Mitth.* Heft i. p. 69.

Calculates the composition of a given dolomitic limestone by the quantity dissolved out by acetic acid.

Rutley, Frank. On the Microscopic Characters of some Eruptive Rocks from Somersetshire and Gloucestershire. [Appendix to Woodward's Memoir on the Geology of East Somerset, &c. (see p. 42). Pp. 208–212, plates v.–ix.]

Describes the microscopic structure of 7 specimens of the igneous rocks of this district; they are, as a rule, highly altered. One is a "felstone containing much magnetite and a little hornblende;" another a devitrified porphyritic pitchstone; the others are dolerites or basalts, in one of which fragments of porcellanite are entangled. T. G. B.

——. On some Structures in Obsidian, Perlite, and Leucite. *Micr. Journ.* vol. xv. pp. 176–183; 2 plates.

The microscopic structure of sections of these rocks having been described and compared, the conclusion is drawn that there is a close relationship between certain of their structures. Analyses are given of obsidian from Lipari, and of leucite from Vesuvius. Of the spherulitic obsidian the author says, "To my mind we have here not merely a microscopic section, but a geological section of considerable significance, ... and we have here a somewhat correct rendering, I believe, of the way in which many great geological phenomena have taken place." E. T. N.

Sauer, G. A. Untersuchungen über phonolithische Gesteine der Canarischen Inseln. [Phonolites of the Canary Islands.] *Zeitsch. gesammt. Nat.* n. F. Bd. xiii. pp. 303–365, pl. v.

Describes sanidine, orthoclase, hornblende, augite, hauyne, and nosean, nepheline, mica, chlorite, titanite, apatite, magnetic and titan-iron, giving several analyses. The phonolites yielding these are divided into felspar-, nephelin-, hauyne-, and nosean-phonolites. W. H. D.

Schmid, E. E. Die Kaoline des thüringischen Buntsandsteins. [Porcelain-clay in Thuringian Trias.] *Zeitsch. deutsch. geol. Ges.* Bd. xxviii. Heft i. pp. 87–110; 6 woodcuts.

The Thuringian porcelain-clays belong mostly to the Middle Bunter Sandstone; they contain quartz-granules to the extent of 6–26 p. c., with microscopic plates of mica, schorl, &c. They are classed therefore as kaolinite rather than pure kaolin, and are of secondary origin. Many analyses given. The chief localities are Eisenberg, Osterfield, and Kmenau. E. B. T.

——. [Ilmenau Porphyrites.] *Zeitsch. deutsch. geol. Ges.* Bd. xxviii. Heft 3, pp. 640–643.

Among the quartzless porphyries, distinguishes those with orthoclase and albite, *e. g.* the micaceous porphyry of Oehrenstock, and those with a felspar differing in composition from oligoclase, and called paroligoclase. E. B. T.

Selwyn, R. A. C. Notes on a stratigraphical collection of Canadian rocks. [Appended to Descriptive Catalogue of a Collection of Minerals exhibited in the Philadelphia Exhibition, pp. 137–147.] *Montreal.* 8vo.

Notes accompanying a collection of 902 specimens of rocks and 172 fossils, arranged stratigraphically to illustrate the geology of Canada. The collection of "Economic Minerals" also contains many rock-specimens, such as coals, building-stones, clays, &c. F. W. R.

Senft, Dr. Ferd. Fels- und Erdboden, Lehre von der Entstehung und Natur des Erdbodens. [Rocks and Soils.] Pp. xvi, 392; 17 cuts. 8vo. *Munich.*

Begins the consideration of the rocks of the earth's crust by describing the minerals of which they are formed, under the head of salts, spars, metallic oxides, &c., pp. 12–81. Silicates are grouped under those containing clay (felspars, zeolites, &c.), or those with magnesia (hornblende, augite, mica), pp. 84–137. By an aggregation of these are formed the mixed crystalline rocks, thus divided:—Those rich in (1) felspar, (2) mica, (3) hornblende, (4) augite, pp. 137–147. Sedimentary or klastic rocks, pp. 147–160. The process of weathering and detrition by which soil is formed are fully treated; the formation of humus, its chemical action, and the exigencies of plant-life and its dependence on the nature of the soil, form the practical side of the question, up to which the petrological portion leads. E. B. T.

Sjögren, A. Om platinans förmodade moderklyft. [The supposed Matrix-rock of Platinum.] *Geol. Fören. Stockholm Förh.* Bd. iii. pp. 179–181.

Concludes, from microscopical researches, that the three metals, chromium, vanadium, and platinum, have a similar origin, and that they were originally formed in a matrix of eruptive rock rich in olivine. The rocks investigated are:—Serpentine, with platinum, from Aurorinsky, Martianfluss, V. of Ural; platinum-conglomerate from Siberia; Chrome-ore from Frankenstein Grochau, and from Veltjord in Norway. E. E.

Stagi, Dr. Francesco. Ricerche Chimiche sui Calcari dei Monti Pisani. [Chemical Examination of Limestones of Pisa.] *Atti Soc. Tosc. Sci. Nat.* vol. ii. pp. 68.

Describes many limestones, giving analyses.

Steenstrup, K. J. V. Om de Nordenskiöldske Jærnmasser, og om Forekomsten af gediegent Jærn i Basalt. [Nordenskiöld's Iron Blocks, and the Occurrence of Native Iron in Basalt.] *Vid. Nat. Fören. Kjöbenhavn,* 1875, pp. 284–306, 2 plates.

An examination of Prof. Nordenskiöld's conclusions as to the meteoric derivation of the native iron associated with basalt near Disco, and of Dr. Nauckhoff's observations and analyses, on which they were in part based. Thinks it of telluric origin, brought up with the basalt or chemically separated within it. Doubts the bedded character of the basalt, among which it was supposed to have fallen; states the breccia and pebbles to be due to re-cementing, or only apparent; describes the iron as occurring not only in lumps and plates but also as dendritic; and while asserting the eukrite of Nauckhoff to be basalt peculiarly weathered, throws doubt on the genuineness of his troilite. Describes his discovery at Assuk, Waigat Strait, of native iron, finely sprinkled through basalt, the largest speck ·45 mm., associated with small knots of graphite, and giving traces of copper, cobalt, and nickel, together with phosphoric acid. H. M.

Steenstrup, K. J. V. Über das Eisen von Grönland. [The Greenland Iron.] *Zeitsch. deutsch. geol. Ges.* Bd. xxviii. Heft 2, pp. 225–233.

Translated and abridged from the Danish by **C. Rammelsberg,** who adds comments. Concludes that the Ovifak iron is probably not meteoric; the basalt is much altered near the iron; the rock accompanying the iron is not eucrite, since the felspar is shown to be not anorthite. E. B. T.

Stelzner, A. [Varallo Rocks.] *Zeitsch. deutsch. geol. Ges.* Bd. xxviii. Heft iii. pp. 623–625.

Describes rocks from the nickeliferous-pyrites locality of Varallo, Val Sesia; one is a hornblende-rock with chromespinell, the other a bronzite-gabbro, with olivine, hornblende, and bronzite in about equal parts. E. B. T.

Steudel, Prof. Material der Steinwaffen aus den Bodenseepfahlbauten. [Material of the Stone Weapons from the Bodensee Lake-dwellings.] *Jahresh. Ver. Nat. Württ.* Jahrg. 32, pp. 75–90.

Describes verrucano, hornblende-rock, quartz, spilite, serpentine, firestone, and nephrite.

Stoddart, W. W. On Auriferous Limestone at Walton. *Rep. Brit. Assoc.* for 1875, *Sections*, pp. 81, 82.

The specimen was from the Carboniferous Limestone near Clevedon, containing 94 p. c. of carbonate of lime. Silver varies from 94 grains to nearly an ounce per ton; gold from 3 to 5 grains per ton. The limestone was more weathered than the rest of the beds. W. T.

Svedmark, E. Mikroskopisk undersökning af uralit-porfyr från Vaksala. [Microscopical Researches on Uralite-porphyry of Vaksala, Sweden.] *Geol. Fören. Stockholm Förh.* Bd. iii. pp. 151–164.

Describes the microscopical structure of the rock. In a crystalline matrix of partly transformed hornblende are imbedded crystals of plagioclase, hornblende, uralite, titaniferous iron, pyrite, epidote.

apatite, and small particles of quartz. The uralite is of somewhat different appearance from that of some foreign localities also examined, (Ural, Dolgelly and Tyn-y-groes in Wales, and Viezena at Predazzo in Tirol). He regards the uralite as altered augite, with the crystalline form unchanged. Chlorite or viridite has afterwards replaced the hornblende, the alteration always beginning at the surface of the crystals, and slowly spreading inwards. E. E.

Terglav, Joh. Die petrographische Beschaffenheit der im Grazer Devon vorkommenden Tuffe. [The Tuffs in the Devonian Rocks of Gratz.] *Min. Mitth.* Heft iv. pp. 207–228.

Describes these rocks with special reference to the microscopic structure of the matrix and of the enclosed black and brown fragments. All the tuffs are not related to one kind of rock: some represent eruptions of melaphyre; others correspond with porphyries. Crystals of felspar have been developed in the matrix of some. F. W. R.

Törnebohm, A. E. Mikroskopiska vergartsstudier. Nos. v.–viii. [Microscopical Rock-studies.] *Geol. Fören. Stockholm Förh.* Bd. iii. pp. 184–187, 210–218.

V. On the distribution of zircon in rocks.—Microscopical zircons are very common in granite, gneiss, porphyry, "eurite," and "hälleflinta" from several localities in Sweden; they also occur in some granites from Christiania in Norway, from Robschütz and Wechselburg in Saxony, from Brixen in Tyrol, the so-called Adamello granite, from St. Gotthard (protogine-granite), from N. America, &c.

VI. On tourmaline as an accessory constituent of "hälleflinta" and "eurite."

VII. On calc-granite.—Gives a sketch of the microscopical structure and composition of the rock; calc-spar (not of secondary origin) takes the place of the quartz.

VIII. Contribution to the knowledge of the mode of origin of the quartzites. Thinks that at least some of the quartzites are quartz-sandstones, whose clastic structure has been totally effaced by silica-cementation, and replaced by a crystalline structure. E. E.

——. [Varieties of Diabase and Gabbro in Sweden.] *Academy of Science, Stockholm*, April. [*Nature*, vol. xiv. p. 174.]

Umlauft, —. Beiträge zur Kenntniss der Thonschiefer. [Clay Slate.] *Lotos.*

Wallace, W. Tripolite. *Chem. News*, vol. xxxiv. no. 878, p. 133.

Note on a diatomaceous deposit in Loch Oich, one of the chain of lakes forming the Caledonian Canal.

Wichmann, Arthur. Ueber Puddingstein. [Pudding-stone.] *N. Jahrb.* Heft ix. pp. 907–918.

Discusses the origin of the concentric coloured rings in the flint-pebbles of the Hertfordshire conglomerate; describes the characters

of the siliceous cementing material; and explains the geological position of the rock. F. W. R.

Wiik, F. J. Mineralogiska och petrografiska meddelanden. [Mineralogical and Petrographical notes.] *Öfv. Finska Vet. Soc. Förh.* Bd. xvii. pp. 7–50.

Gives a description of the physical, optical, and microscopical characters of the following Finland minerals and rocks, viz.:—Triplite, metaxoite, pikrofluite, marmolite, skotiolite, hisingerite, ripidolite, olivine-diabase (pseudo-hyperite), sardovalite, olivine-gabbro (2 localities), gabbro (2 localities), diabase, diabase-aphanite, uralite-porphyry, diorite (2 localities), and diorite-porphyry. E. E.

Winther, A., and W. Will. Ueber den Basalt des Schiffenberges. *Ber. oberhess. Ges.* t. xv. pp. 33–44.

The Schiffenberg basalt is composed of augite, olivine, magnetic and titaniferous iron, with other minerals. Many analyses are given. W. H. D.

Zirkel, Prof. Ferdinand. Microscopical Petrography. *Rep. U. S. Geol. Expl. 40th Par.* vol. vi. pp. 298; 12 pls. 4to. *Washington.*

The following rocks are described:—Crystalline schists and related rocks; granite and granite-porphyry; felsite-porphyry and syenite; diorite, hornblende-porphyry, diabase, melaphyre, and gabbro; propylite, quartz-propylite, hornblende-andesite, dacite; trachyte and rhyolite; basalts, with augite, andesite, leucite rocks, and clastic rocks. The work is the result of the examination of a large collection of rocks made by the Survey. More than 2500 specimens have been examined microscopically. Holds that the eruptions in the Tertiary period in this district took place in the following order—Propylite, andesite, trachyte, rhyolite, basalt,—an order established elsewhere by Richthofen. The schists consist of gneiss, micaceous and hornblendic, hornblende-rock (containing few other minerals), quartzites, mica-slate, garnet-rock, paragonite-schist with disthene, clay-slate, and crystalline marble. The eruptive granites are supposed to be Jurassic; others are metamorphic. T. G. B.

——. [On some American Rocks.] *Zeitsch. deutsch. geol. Ges.* Bd. xxviii. Heft 3, pp. 630, 631.

Note on rock specimens from the 40th parallel, United States, comprising archaic schists with liquid CO_2 cavities, granites, diorites, &c. Comparisons between European augite-andesites and American basalts are added. E. B. T.

——. [Variolite.] *N. Jahrb.* Heft iii. pp. 279, 280.

Reply to Gümbel's strictures on the writer's remarks on the variolite of Berneck in the Fichtelgebirge. Denies that this variolite is petrologically related to diabase. Admits the term *perldiabase* on the understanding that it is not to indicate a *perlitic diabase*. F. W. R.

See also:—

Boué, Dr. A. Serpentine: p. 50.

Clough, C. T. Basalt: p. 8.

Day, St. J. V. Analyses of Scotch Coals and Limestones: p. 10.

Dewalque, C. Plutonic Rocks, Belgium: p. 59.

Dove, G. Analyses of Lincolnshire Stone and Clay: p. 11.

Hauer, C. von. [Analyses of Rocks in S. Tyrol.] *Boll. R. Com. geol. Ital.* vii. pp. 146–149. Translated from *Verh. k.-k. geol. Reichs.*, see GEOLOGICAL RECORD for 1875, p. 212.

Haughton, Prof. S. Trap-dykes, N.E. Ireland: p. 15.

Hawes, G. W. Greenstones, New Hampshire: p. 133.

Judd, Prof. J. W. Volcanic Rocks: p. 80.

Koch, Dr. A. Serpentine, Slavonia: p. 82.

Lill, — von. Analyses. MINERALOGY, *post.*

Nolan, J. Rocks of Siebengebirge and Eifel: p. 99.

Penning, W. H. Concretions: p. 30.

Pettersen, K. Serpentine and Olivine-rock, N. Norway: p. 103.

Seeland, F. Hüttenberg Rocks: p. 109.

Stoddart, W. W. Analyses of River Avon Mud: p. 17 (under Howard).

——. Analyses of Bristol Coals: p. 35.

Ward, J. C. Rocks of Lake District: p. 38.

Westmoreland, J. W. Analyses of Yorkshire Coals: p. 13 (under Green).

METEORITES.

Anon. (A. W. ? Weissbach.) Der Eisenmeteorit von Rittersgrün im sächsischen Erzgebirge. [Iron meteorite of Rittersgrün, Saxony.] Pp. 5, plate. 4to. *Freiberg.*

Fell in 1862, weight 175 lbs., sp. gr. 4·29, composition ·3 of nickeliferous iron, the rest hypersthenic bronzite, troilite, and a little schreibersite. W. H. D.

Burton, B. S. Notice of a Meteorite from Madison Co., N.C. *Amer. Journ.* ser. 3, vol. xii. p. 439.

Fell in August 1873; said to have weighed about 25 lbs.; but pieces have since been detached. Consists of iron 94·24 p. c., nickel 5·17 p. c., with a little cobalt, phosphorus, and copper. T. G. B.

Daubrée, —. Expériences faites pour expliquer les alvéoles de forme arrondie que présente très-fréquemment la surface des Météorites. [Pitted Surface of Meteorites.] Pp. 7. 4to. *Paris.*

Flight, Dr. W. The Fall of Meteorites in Berkshire in the Seventeenth Century. *Athenæum*, July to Dec. pp. 661–662.

Historical references.

Geinitz, Dr. F. E. Das Nenntmannsdorfer Meteoreisen im Dresdener Museum. [The Nenntmannsdorf Meteoric Iron.] *N. Jahrb.* Heft vi. pp. 608–612.

This iron, now in the Dresden Mineralogical Museum, was found in 1872. It contains iron 93·04, nickel 6·16, phosphorus 0·22 p. c.; sp. gr. 6·21. Troilite is disseminated through the iron; and some crystals occur which are supposed also to belong to this species. Treatment with acid exposes the granules of troilite, but does not develop Widmannstättian figures. Brownish red liquid drops are exuded from the iron, and are referred to the presence of a chlorine-compound. F. W. R.

Maskelyne, Prof. N. S. The Rowton Siderite. *Nature*, vol. xv. p. 272.

Fell at Rowton, near Wellington in Shropshire, on the 20th of April. Presented to the British Museum. The second iron meteorite known to have fallen in Great Britain. C. E. D.

——. The Pitted Surface of Meteorites. *Phil. Mag.* ser. 5, vol. ii. pp. 126–131.

Refers to an explanation of this structure given by Daubrée, from which the author differs; the structure is very similar to that exhibited by the surfaces of fragments of gunpowder projected unconsumed from the 35-ton and 80-ton guns at Woolwich. He regards it as due to the

want of homogeneity of the mass of the meteorite allowing the heat to penetrate more rapidly from its exterior in some places than in others, so that the sudden expansion produced by the intense heat in a body (probably brittle, owing to the cold of space traversed before reaching the earth's atmosphere) tears out small pieces and thus pits the surface. The greater fusibility or combustibility of some of the ingredients of the meteorite may sometimes produce effects, but not as a general rule.

T. G. B.

Pisani, —, and — Daubrée. Meteorito de Roda, provincia de Huesca. *Bol. Com. map. geol. Españ.* p. 277.

Smith, J. Lawrence. Researches on the solid carbon compounds in Meteorites. *Chem. News*, vol. xxxiii. no. 859, pp. 196, 197; no. 860, pp. 204, 205; no. 861, pp. 216, 217; and 8vo. *Louisville.*

Certain meteorites called *carbonaceous* meteorites, from containing a small proportion of carbon, might more appropriately be termed *melanotic*, from their black colour. Four of these are known—one which fell at Alais in 1806, one at Kold-Bokeveldt in 1838, another at Kaba in 1857, and the last at Orgueil in 1864; they contain respectively about 3, 2, 0·6, and 6 p. c. of carbonaceous matter. The author publishes results of his examination of the Alais and Orgueil meteorites, and compares the characters of the carbon which they contain with that occurring as graphitic matter in certain iron meteorites. He is inclined to adopt Berthelot's suggestion, that the graphitic carbon of meteorites may have been formed by the reaction of bisulphide of carbon upon incandescent iron. Meteoric graphite is more readily oxidized than terrestrial graphite. The carbon of the melanotic meteorites is referred to a similar origin to that of the carbon of meteoric iron.

F. W. R.

——. Account of a New Meteoric Stone that fell on the 15th March, 1865, in Wisconsin. *Amer. Journ.* ser. 3, vol. xii. pp. 207–210.

Two fragments discovered, thrown off from a main body supposed not to have fallen. One was lost; the other weighed about 700 grains. From the analysis given, the meteorite appears to contain bronzite (? with a little anorthite), hyalosiderite, nickeliferous iron, and troilite. The analysis corresponds closely with that of the Meno meteorite: fell Oct. 1, 1861.

T. G. B.

See also:—

Steenstrup, K. J. V. Reputed Meteoric Iron of Ovifak: p. 216.

MINERALOGY.

[In preparing abstracts of mineralogical papers it has been thought right to adhere as far as possible to whatever system of nomenclature, chemical notation, and crystallographic formulæ may have been used by the authors. No attempt has therefore been made to secure uniformity on these points. Where two or more symbolical expressions for the same thing have been used, the first has generally been taken. In some cases exceptions to the foregoing rules have been made to avoid typographical difficulties.]

Achiardi, Prof. A. d'. Su di alcuni Minerali Toscani. Brevi Notizie. [Tuscan Minerals.] *Atti Soc. Tosc. Sci. Nat.* vol. ii. pp. 112–118.

Describes Guadalcazarite of Levigliani, pyrrhotine and Meneghinite of Bottino, and hæmatite of Borghetto, giving analyses of the last two by **Martin** and **Funaro**, and quoting others of nos. 1 and 3. W. H. D.

——. [Tin-ore in Tuscany.] *N. Jahrb.* Heft iii. p. 286.

Note on the discovery of cassiterite, with brown iron-ore, in the Cento Camerelle, where the Romans, and perhaps the Etruscans, had important mines. The tin-stone contains 72·45 p. c. of tin. F. W. R.

——. [Tuscan Minerals.] *N. Jahrb.* Heft v. pp. 636, 637.

Records the discovery of fine crystals of magnetic pyrites at the Bottino Mine, near Seravezza, and of a mineral which appears to be a variety of *Guadalcazarite* from the quicksilver mine of Levigliani. The new mineral differs, however, from typical Guadalcazarite in containing no selenium, and in being richer in zinc and iron. If it should prove on quantitative analysis (for which not sufficient has yet been obtained) to be a new species, it is to be termed *Leviglianite*. F. W. R.

Anon. Descriptive Catalogue of a collection of the Economic Minerals of Canada. Pp. 152. 8vo. *Montreal.*

A catalogue, with full descriptive notes, of a large collection of minerals exhibited in the Philadelphia International Exhibition. It follows Logan's classification of the Canadian minerals exhibited in London in 1862. **Mr. Selwyn** contributes notes on stratigraphical geology in illustration of a collection of rocks and fossils. F. W. R.

——. A Tin Mine in Tuscany. *Journ. App. Sci.* vol. vii. p. 56.

Note of the discovery of cassiterite in Lias near Campiglia.

——. Carbonado. *Ibid.* p. 60.

Note of the finding in Brazil of black carbon as hard as diamond.

Archbold, Dr. —. On the formation of Flint. *Norwich Geol. Soc.*; reprinted from the *Norwich Argus*, March 11.

Gives analyses of four specimens of flint.

Baumhauer, H. Die Aetzfiguren am Lithionglimmer, Turmalin, Topas und Kieselzinkerz. [Erosion-figures on Lithia-mica, Tourmaline, Topaz, and Silicate of Zinc.] *N. Jahrb.* Heft i. pp. 1–8, plate i.

Lepidolite from Zinnwald, acted on by fluor-spar and sulphuric acid, exhibits erosion-figures which appear to be triclinic. After many fruitless experiments a black tourmaline was etched with fused caustic potash, the character of the figures agreeing with the hemimorphism of the crystal. Rhombic impressions were produced on the two parallel basal pinacoids of crystals of topaz, thus tending to prove that this species is not hemimorphic. Silicate of zinc from Altenberg was treated with warm hydrochloric acid, and a face of $\infty\breve{P}\infty$ showed figures which agree with the hemimorphism of the species; but to show the correspondence between the form of the figure and that of the crystal it is necessary to invert the position of the erosion-figures. F. W. R.

——. [Erosion-figures on Pyromorphite, Mimetesite, and Vanadinite.] *N. Jahrb.* Heft iv. pp. 411–413.

The crystals were etched with warm dilute nitric acid. Pyromorphite from Bleistadt (Bohemia) exhibited very fine pyramidal-hemihedral structure; and it was less marked in crystals of the same species from other localities. Mimetesite is also shown to be pyramidal-hemihedral; but no definite results were obtained from the crystals of vanadinite, which were very small. F. W. R.

——. Die Aetzfiguren am Adular, Albit, Flusspath und chlorsauren Natron. [Erosion-figures on Adularia, Albite, Fluor-spar, and Chlorate of Soda.] *N. Jahrb.* Heft vi. pp. 602–607, plate.

Treated with fluor-spar and sulphuric acid, crystals of adularia exhibited figures which exactly corresponded with the symmetry of the monoclinic system; while albite showed markings corresponding with the symmetry of triclinohedral crystals; fluor-spar etched with sulphuric acid showed depressions which were probably referred to $m\mathrm{O}m$ and $m\mathrm{O}$. F. W. R.

Beck, W. von. Ueber eine neu entdeckte Lagerstätte von Silbererzen im Troitzker Bezirk des Gouvernement Orenburg. [New Deposits of Silver Ores in the Government of Orenburg.] *N. Jahrb.* Heft ii pp. 162–170.

A quartz vein, running through crystalline schists, is bounded by ochreous saalbands, which contain compounds of silver with chlorine, bromine, and iodine. Two other silver-bearing veins occur in the neighbourhood. The haloid combinations of silver in these Russian veins resemble those of South America. F. W. R.

Bergstrand, C. E. Bidrag till kännedomen om den i Wemdalen förekommande vivianiten samt andra i samband dermed uppträdande jordaflagringar. [Vivianite and other associated Ores in Wemdal.] *Geol. Fören. Stockholm Förh.* Bd. ii. pp. 335–340.

Two analyses are given.

Blake, Dr. James. On Roscoelite, a Vanadium Mica. *Amer. Journ.* ser. 3, vol. xii. pp. 31, 32; *Chem. News,* vol. xxxiv. no. 871, p. 46.

Describes under this name a well-marked species of mica, containing a large percentage of vanadium. It occurs in the hanging wall of a small quartz-vein in porphyry, in a gold-mine at Granite Creek, El Dorado County, in the lower hills on the western slope of the Sierra Nevada, California (see **Genth,** p. 228). G. A. L.

Blake, Prof. W. P. Notes on the Occurrence of Siderite at Gay Head, Mass. *Trans. Amer. Inst. Min. Eng.* vol. iv. pp. 112, 113.

This mineral occurs in thick beds in the clay formations of Martha's Vineyard. It is found in masses which have been loosened from the clay beds forming the bluffs; and they contain imprints of leaves and stems of plants. Some of the beds are of secondary origin. R. B. N.

——. Manufacture of Ferro-Manganese in Austria. (*Amer. Inst. Min. Eng.*) *Iron,* n. s. vol. vii. p. 551.

Analysis of ore.

Blomstrand, C. W. Bidrag till kännedomen af Långbangrufvans mineralier. [Minerals of Långban Mine, Sweden.] *Geol. Fören. Stockholm Förh.* Bd. iii. pp. 123–133.

Contains a description of the mode of occurrence of manganesite and some other minerals, and analyses and description of *Barylite,* a new mineral, whose formula is :—

$$Ba^4Al^2Si^7O^{24} = \left.\begin{matrix} 4R\ SiO^3 \\ 3R^2SiO^4 \end{matrix}\right\}.$$

E. E.

Bořický, Prof. Dr. Em. Ueber einige ankerit-ähnliche Minerale der silurischen Eisensteinlager und der Kohlenformation Böhmens, und über die chemische Constitution der unter dem Namen Ankerit vereinigten Mineralsubstanzen. [On Minerals of the Ankerite Group from the Silurian Iron-ore deposits and from the Coal formation of Bohemia, and on the Chemical Constitution of the Substances grouped under the name of Ankerite.] *Min. Mitth.* Heft i. pp. 47–58.

With few exceptions the ankerite-minerals may be referred to the general formula—$CaCO_3 + FeCO_3 + x(CaCO_3 + MgCO_3)$, where x may have 10 values, viz. $\frac{1}{2}$, 1, $\frac{4}{3}$, $\frac{3}{2}$, $\frac{5}{3}$, 2, 3, 4, 5, 10. Proposes to separate the first 5 varieties as *Ankerite*, and the second 5 as *Parankerite.* If $x=1$ the variety is called *normal ankerite*; if $x=2$, *normal parankerite*; while the other varieties are distinguished by addition of Greek letters, as *Ankerite* γ, which is an association of one molecule of ankerite with one molecule of parankerite. F. W. R.

Braun, Max. [Silicate of Zinc in Sardinia]. *N. Jahrb.* Heft v. pp. 538, 539.

Note on occurrence of Galmei-veins near Elvas in Sardinia. The mineral forms horizontal strings in the saalbands of a dyke of porphyry which cuts through syenite. The sides of the dyke are formed by a

breccia of hornstone, quartz, and clay, in which occur galena, cerussite, and pyromorphite. The occurrence of galena, with trivial exceptions, had previously been recorded only from limestone or from the neighbourhood of limestone. F. W. R.

Brögger, W. C. Über neue Vorkommnisse von Vesuvian und Chiastolith in Norwegen. [Vesuvian and Chiastolite in Norway.] *Zeitsch. deutsch. geol. Ges.* Bd. xxviii. Heft i. pp. 69–74; 2 woodcuts.

1. Notices vesuvian crystallized out in fossiliferous limestone, occupying cavities left by the solvent action of water on corals (*Cyathophyllum* and *Halysites*) contained in the rock. Contact with granite seems to be the cause of this appearance. Locality, between Drammen and Konerud. 2. Notices the occurrence near L. Ekern of chiastolite in Graptolite-slates, the Graptolites not being obliterated by the action which has produced the crystals in their midst. E. B. T.

Brögger, W. C., and G. vom Rath. Über grosse Enstatit-Krystalle von Kjörrestad im Kirchspiel Bamle, südliches Norwegen, aufgefunden von W. C. Brögger und H. H. Reusch. [Large Enstatite Crystals, S. Norway.] *Monatsb. k. preuss. Ak. Wiss.* pp. 549–564, pls. i., ii.; *Phil. Mag.* ser. 5, vol. ii. pp. 379–387.

Gives analyses and crystallographic description.

Brush, Prof. G. J. Contributions from the Sheffield Laboratory of Yale College. No. xxxix.—On the Chemical Composition of Durangite. *Amer. Journ.* ser. 3, vol. xi. pp. 464, 465.

Gives analysis. The formula arrived at is :—

$$(Na, Li)^2 (Al, Fe, Mn)\, As^2(O, F^2)^9.$$

Burghardt, [Dr.] C. A. On the formation of Azurite from Malachite. *Proc. Lit. Phil. Soc. Manch.* vol. xv. pp. 72, 73.

Notes the change of condition of a specimen of malachite from Alderley Edge, by exposure to the atmosphere for a few months.

Chapman, E. J. On some Blowpipe Reactions. *Phil. Mag.* ser. 5, vol. ii. pp. 459–466.

Church, [Prof.] A. H. Dysodile. *Chem. News*, vol. xxxiv. no. 881, p. 155.

The analysis of the combustible portion of a specimen of dysodile from Rotl, near Bonn. Dysodile does not belong to the same group of minerals as tasmanite. F. W. R.

Cloud, T. C. Note on Atacamite. *Chem. News*, vol. xxxiv. no. 890, p. 254.

Describes the occurrence of the mineral at Wallaroo, S. Australia, giving an analysis of a sample, and explaining its behaviour under the influence of heat and air. F. W. R.

Cohen, E. [Microscopical Inclosures in South African Diamonds.] *Naturforscher*, November.

——. Ueber Einschlüsse in sudafrikanischen Diamanten. [Enclosures in S. African Diamonds.] *N. Jahrb.* Heft vii. pp. 752, 753.

Finds that some of the specks in diamonds, taken for carbon, consist of iron-glance, in some cases showing crystalline forms. Concludes that most, if not all, the specks are due to this mineral. F. W. R.

Cossa, Prof. A. Sulla predazzite periclasifera del Monte Somma. [Periclase-Predazzite of Monte Somma.] Pp. 8. 4to. *Rome.*

Dana, E. S. Mineralogical Notes.—No. i. On the Optical Character of the Chondrodite of the Tilly Foster Mine, Brewster, New York. *Amer. Journ.* ser. 3, vol. xi. pp. 139, 140.

Repeated measurements, of which particulars are given, confirm the results, before obtained, that chondrodite crystals of the second type belong optically to the monoclinic system. A crystal of the third type has been examined, and is also shown to be at variance with the supposed orthorhombic character of the species. G. A. L.

——. Mineralogical Notes.—No. ii. On the Samarskite of Mitchell County, North Carolina. *Amer. Journ.* ser. 3, vol. xi. pp. 201–204; figs. in text.

This mineral is found in the mica mines of this region, which are worked in granite-veins intersecting gneiss and mica-slate. Other localities are given. The associated species are columbite, another mineral of this tantalic group closely allied to pyrochlore and to microlite, and a yellow mica. An analysis of samarskite, by **Miss Ellen Swallow**, gives:—Metallic acids, tantalic group, 54·96; SnO^2, 0·16; UO, 9·91; FeO, 14·02; MnO, 0·91; CeO, 5·17; YO, 12·84; MgO, 0·52; insol. 1·25. Full crystallographic characters are given. G. A. L.

——. Mineralogical Notes.—No. iii. On new twins of Staurolite and Pyrrhotite. *Amer. Journ.* ser. 3, vol. xi. pp. 384–388. With notes on the composition and mode of occurrence of the pyrrhotite from Elizabethtown, Ontario, pp. 387, 388. Figures in text by **Dr. B. J. Harrington.**

The twin Staurolites are from Cherokee County, N. Carolina, and Tannin County, Georgia. Analyses of the pyrrhotite are given by Dr. Harrington. G. A. L.

——. On the Chondrodite from the Tilly-Foster Iron-mine, Brewster, New York. *Trans. Conn. Ac. Sci.* vol. iii. pt. 1, pp. 67–96, pls. xi.–xiii.

Noticed, from condensed account in *Amer. Journ.*, in GEOLOGICAL RECORD for 1875, p. 235.

Daubrée, Prof. Exemples de formation contemporaine de la Pyrite

de fer dans des sources thermales et dans l'eau de la mer. [Recent Formation of Iron Pyrites in Thermal Springs and in Sea-water.] *Bull. Soc. Géol. France*, 3 sér. t. iv. pp. 53, 54.

Résumé of the paper noticed in the GEOLOGICAL RECORD for 1875, p. 236.

Daubrée, Prof. Formation contemporaine de diverses Espèces Minérales sous l'action des Sources Thermales. [Formation of Minerals by Thermal Springs.] *Compt. Rend. Assoc. Franç.* 1875, pp. 687–689.

Enumerates several minerals formed by thermal springs. See GEOLOGICAL RECORD for 1875, p. 236.

Des Cloiseaux, Prof. A. Memoir on the three new types of Humite. *Phil. Mag.* ser. 5, vol. ii. pp. 286–291.

The different forms of humite have been referred to three types belonging to the orthorhombic system. In consequence of examination of the optical characters, the author removes type II. (yellow humite, Vesuvius, brown chondrodite, Sweden) and III. (pale yellow and white humite, Monte Somma) to the clinorhombic system. Proposes to restrict humite to the orthorhombic form, chondrodite to type II., and to call III. provisionally clinohumite. T. G. B.

——. [Humite.] *N. Jahrb.* Heft vi. pp. 640–645; 4 woodcuts.

Crystallographic and optical description of Humite. Only type I. is rhombic, the two others being monoclinic. Restricts the term *Humite* to type I.; uses *Chondrodite* for type II., and *Clinohumite* for type III. Tables of observed forms and goniometric determinations are given, with figures illustrating the optical characters. F. W. R.

Doelter, C. Minerali del Monzoni nel Tirolo meridionale. *Boll. R. Com. geol. Ital.* vii. pp. 84, 85.

Table of minerals, &c., extracted from the paper in *Min. Mitth.* See GEOLOGICAL RECORD for 1875, p. 239.

——. Die Bestimmung der petrographisch wichtigeren Mineralien durch das Mikroskop. [Microscopic Determination of the Principal Petrographic Minerals.] 8vo. *Wien.* 1876. Pp. vii, 36.

Describes the preparation of sections; the best form of microscope; the use of the micrometer, polariscope, and dichroiscope; chemical tests; structure of minerals; microscopic enclosures; value of morphological and optical peculiarities; and gives tables for the diagnosis of minerals under the microscope. F. W. R.

Eck, H. [Relation between different Species grown together.] *N. Jahrb.* Heft iv. pp. 405–409.

Discusses the law of growth between quartz and calcite, and recognizes the work of Breithaupt.

Engström, N. Analys af s. k. ljus knebelit från Dannemora. [Ana-

lysis of so-called "pale knebelite" from Dannemora, Sweden.] *Geol. Fören. Stockholm Förh.* Bd. iii. pp. 116, 117.

The chemical composition of the mineral is represented by the formula:—$FeCl_2+3(5RO+4SiO_2)+8H_2O$. It is the same mineral which was determined in 1874 by Prof. A. E. Nordenskiöld to be pyrosmalite. E. E.

Field, Frederick. Note on a New Cornish Mineral. *Chem. News*, vol. xxxiv. no. 880, p. 146.

Preliminary note on a mineral found to contain $3FeO . P_2O_5 . 4H_2O$. [Afterwards described as *Ludlamite*.]

Foster, Clement Le Neve. Henwoodite. *Chem. News*, vol. xxxiv. no. 882, p. 173.

Letter on Major Ross's blowpipe examination of Henwoodite. His supposed "new test for cupric phosphate" is only a modification of Berzelius's method of fusing with lead. F. W. R.

Frenzel, A. [Quartz with Fluor-spar at Schneeberg.] *N. Jahrb.* Heft ii. p. 171.

Continuation of a controversy with Dr. Stelzner.

Friedel, Ch. Histoire de la Mineralogie. [History of Mineralogy.] *Rev. Sci.* xi. pp. 505–511.

Recounts researches, especially on the artificial production in the laboratory of numerous minerals.

Geinitz, F. E. Studien über Mineralpseudomorphosen. [Studies on Pseudomorphs.] *N. Jahrb.* Heft v. pp. 449–503; plate and 2 woodcuts.

Applies the microscope to the study of pseudomorphs. Maintains that the classification of pseudomorphs must be based on the chemical relation of the original to the altered mineral. Blum's division of "Verdrängungs-Pseudomorphosen" is criticised, and the name rejected. The microscopic characters of 30 pseudomorphs are described. Some pseudomorphs of chalcedony after calcite show microscopic particles of calcite, which do not represent the original mineral, but are recent products. Like appearances are presented by some of the well-known pseudomorphs of blue chalcedony after cubic fluorite, from Transylvania. F. W. R.

Genth, Dr. F. A. On some American Vanadium Minerals. *Amer. Journ.* ser. 3, vol. xii. pp. 32–36; and *Chem. News*, vol. xxxiv. no. 874, pp. 78–80; and "On Roscoelite," *Phil. Mag.* ser. 5, vol. ii. pp. 156–158.

Gives analyses and full descriptions of Roscoelite (see **Blake**, p. 224), a vanadium-mica; and of *psittacinite*, a new hydrous vanadate of lead and copper, from Iron Rod Mine, Silver Star District, Montana.

——. Second Preliminary Report on the Mineralogy of Pennsylvania. *Harrisburg.*

Contains numerous analyses of minerals, rocks, waters, and natural gases.

Gonnard, F. Minéralogie du Département du Puy-de-Dôme. [Mineralogy of Puy-de-Dôme.] Ed. 2, pp. 192. 12mo. *Paris.*

The geological position and localities of each mineral species found in the district are given.

Grattarola, Prof. Giuseppe. Note mineralogiche. *Boll. R. Com. geol. Ital.* vii. pp. 323–345.

Notes first minerals from fresh localities in Elba. *Idrocastorite* is described as new, formula given $=12{\cdot}5\ SiO_2$, $2{\cdot}5\ Al_2O_3$, CaO, $10\ H_2O$. Pinite pseudomorphic after andalusite by alteration, is noted, &c. Passes then to Tuscany, where some new localities are noted; among these is goslarite, from near Massa Marittima, formed from decomposition of blende. E. B. T.

Groth, P. Physikalische Krystallographie, und Einleitung in die krystallographische Kenntniss der wichtigeren Substanzen. [Physical Crystallography, and Introduction to Crystallographic Knowledge of the more important Substances.] Pp. 530, 557 woodcuts, and 3 plates (1 coloured). 8vo. *Leipzig.*

Part i. treats of the physical characteristics of crystals in general, without reference to their form, and includes their density, elasticity, cohesion, hardness, and molecular vibrations, as well as their optic, thermic, magnetic, and electric properties. Part ii. is devoted to geometrical and physical crystallography. Part iii. describes and explains the instruments employed and methods adopted in physico-crystallographical researches, and concludes with a comparative table of symbols used in the crystallographic systems of Naumann, Miller, and Levy. The author's object is to supply a course of crystallographic study sufficient for those who have not the advantage of professional or other instruction. T. W. D.

Hartley, W. N. On the presence of Liquid Carbon Dioxide in Mineral Cavities. *Journ. Chem. Soc.* ser. 2, vol. xiv. pp. 137–143; with 4 figs.

By observing the critical point of the liquid in certain crystals of quartz, shows that this liquid is condensed carbon dioxide, often associated, however, with water. Contact of a carbonate with a hot solution of silica would under considerable pressure yield carbon dioxide, which on cooling would condense, along with water, to the state of liquid in the cavities of the silica. F. W. R.

——. On Variations in the Critical Point of Carbon Dioxide in Minerals, and Deductions from these and other Facts. *Journ. Chem. Soc.* ser. 2, vol. xiv. pp. 237–250; 3 figs.

Gives variations in the critical point of carbon dioxide, from about 25°·5 to 33°·7, as observed in cavities in topaz, tourmaline, sapphire, beryl, and rock-crystal. Contains inferences as to the formation of

corundum, topaz, and diamond. Suggests that diamonds may have been formed by the action of reducing agents on very highly compressed carbon dioxide at temperatures above its critical point. F. W. R.

Hartley, W. N. The Identification of Liquid Carbonic Acid in Mineral Cavities. *Micr. Journ.* vol. xv. pp. 170–175, pl. 132.

It being known that liquid carbonic acid becomes a gas at a temperature of 30°·92 C., various sections of crystals with fluid-cavities were examined by first heating to a certain temperature, and then observing under the microscope whilst cooling. From repeated experiments the author concludes that many such cavities contain liquid carbonic acid. An explanation of the appearance of boiling exhibited by the fluid in these cavities is also given. E. T. N.

Hawes, G. W. Contributions from the Sheffield Laboratory of Yale College.—No. XL. On a Lithia-bearing variety of Biotite. *Amer. Journ.* ser. 3, vol. xi. pp. 431, 432.

This biotite is from the felspar-quarries of Portland, in Connecticut. Two analyses are given, showing that the mica is an iron-biotite, in which part of the potash is replaced by lithia, and containing more ferrous oxide and less magnesia than usual. G. A. L.

Heddle, Prof. Chapters on the Mineralogy of Scotland. Chap. 1st. The Rhombohedral Carbonates. Part I. *Trans. R. Soc. Edin.* vol. xxvii. pt. 4, p. 493.

Notes and analyses of the following minerals:—ankerite, breunnerite, dolomites (various), variously coloured calcites. Concludes with notes on dolomite pseudomorphous after scalenohedra of calcite from trap tuff at Kinkell, near St. Andrews. R. E., Jun.

Helland, A. Om Kogsaltkrystaller og flydende Kulsyre i et og samme Hullrum i Kvarts fra en Pegmatitgang. [On Crystals of Sodic Chloride and Fluid Carbonic Acid in the same Cavity in Quartz from a Vein of Pegmatite.] *Arch. Math. Naturvid.* pp. 6, 5 figs. in text.

Microscopic description. The writer's observation, that crystals of sodic chloride occur in cavities which also contain fluid carbonic acid, tends to throw light on the nature of the so-called "outer zone" which is known to separate the carbonic acid from the surrounding quartz in many carbonic acid cavities. E. E.

Helmkacker, R. Pyrit von Waldenstein in Kärnthen. [Pyrites of Waldenstein, in Carinthia.] *Min. Mitth.* Heft i. pp. 13–24; 2 plates.

A crystallographic memoir. 202 crystals have been studied, and the following new forms have been detected:—π (940), π (180), (433), (322), π (532), π (742), π (13·73), π (14·11·10), π (13·96), π (314). F. W. R.

——. Mineralogische Beobachtungen aus dem östlichen Böhmen.

[Mineralogical Observations from E. Bohemia.] *Min. Mitth.* Heft i. pp. 25–38; woodcut.

Records the occurrence of a large number of minerals from various localities where they had not been previously detected. The woodcut illustrates the occurrence of amber, in a lenticular mass, in Cretaceous sandstone (Cenomanian) near Peklo. Amber is also found in E. Bohemia, in Neogene strata. F. W. R.

Hintze, Dr. C. Regelmässige Verwachsung von Eisenkies mit Eisenglanz. [Regular Growth of Iron-pyrites and Iron-glance.] *Min. Mitth.* Heft ii. p. 141.

A crystal of pyrites from Elba shows some of the faces of the cube, covered with a thin layer of iron-glance, with triangular markings corresponding with rhombohedron. F. W. R.

Hirschwald, Prof. Dr. J. [Double Refraction of Leucite.] *N. Jahrb.* Heft vii. pp. 733–735.

Tschermak finds that the leucite of Aquacetosa is doubly refracting; Vom Rath thereupon maintains that this supports his view of the quadratic crystallization of this species; and Hirschwald now denies the validity of this inference by pointing to the anomalous optical properties of many isometric species, whence he concludes that the cubic crystallization of leucite is not disproved. F. W. R.

——. [Leucite.] *N. Jahrb.* Heft v. pp. 519–525.

Controversial. A reply to Vom Rath's objections to the author's "Zur Kritik des Leucitsystems."

How, H. Contributions to the Mineralogy of Nova Scotia. *Phil. Mag.* ser. 5, vol. i. pp. 128–138.

Doubts having been expressed (*Chem. News*, vol. xxx. p. 165) as to three minerals from Triassic trap in the Bay of Fundy, described by the author (*Edin. New Phil. Journ.* vol. x. p. 84), and named respectively cyanolite, cerinite, and centralassite; the author states his adherence to the former opinion as regards the first two, and adds several particulars concerning the third, to show that while it, okenite, and gyrolite are closely related, "the merging of one in either of the others as a species is not admissible." T. G. B.

Hudleston, W. H. Visit to the Mineralogical Department of the British Museum. *Proc. Geol. Assoc.* vol. iv. no. 8, pp. 480–482.

Reports a demonstration on the feldspars and micas by **Prof. N. S. Maskelyne.**

Hunt, Dr. T. S. The Cornwall Iron Mine and some Related Deposits in Pennsylvania. *Trans. Amer. Inst. Min. Eng.* vol. iv. pp. 319–325.

Contains observations on the crystalline iron-ores of Pennsylvania. These are chiefly magnetites, occurring along both borders of the Meso-

zoic red sandstone which stretches through the State, though considered to belong to a lower horizon than the Potsdam sandstone of the New York system. Analyses of the ores, by **Dr. F. A. Genth,** are appended. R. B. N.

Hunt, Dr. T. S. A New Ore of Copper and its Metallurgy. *Trans. Amer. Inst. Min. Eng.* vol. iv. pp. 325–328.

Occurs in the clay-ore of Jones's Mine, Pennsylvania. Hitherto known as a clay-carbonate, though on a quantitative examination it was found to contain no carbonates, but to be a kind of copper-chlorite. Its physical and chemical characters prove it a new species, for which the name *Venerite* is proposed. Analyses, by the author and **G. W. Howes,** given. R. B. N.

Hutchings, W. M. Notes on Mineral Analyses. *Chem. News*, vol. xxxiv. no. 879, p. 141.

Contains original analyses of chrysocolla and "copper pitchblende" imported into this country from Mexico for copper-smelting. [The "copper pitchblende" is what is usually called "pitchy copper-ore" (Kupferpecherz)]. F. W. R.

Jones, Prof. T. R. On Quartz, Chalcedony, Agate, Flint, Chert, Jasper, and other forms of Silica, geologically considered. *Proc. Geol. Assoc.* vol. iv. no. 7, pp. 439–458.

A *résumé* of facts and inferences as to modes of origin. Ordinary quartz and its varieties have been deposited by aqueous (probably hydrothermal) agency. Chalcedony has been formed by water holding silica in solution, derived immediately from the rocky matrix; sometimes the silica seems to have replaced calcite or zeolites; how far such stones are due to gelatinous silica has yet to be determined. Flint has usually been formed by the replacement by silica of detrital carbonate of lime. Siliceous replacement of the outer layers of carbonate of lime has produced beekite, potato-stones, &c. Hornstone and chert are of two kinds, one formed of grains of silica united by siliceous cement, the other formed in the same way as flint. Jasper is usually an altered clay. W. T.

Kenngott, A. [Sicilian Sulphur.] *N. Jahrb.* Heft i. p. 41.

Note on specimens of sulphur and aragonite recently received from Cinanciana in Sicily.

——. [Metaxoite.] *N. Jahrb.* Heft v. pp. 517–519.

Suggests that the metaxoite of Lupikko, in Finland, is a doubtful species. It is described as made up of a crystalline and an amorphous substance, and is therefore not homogeneous. F. W. R.

Kern, Sergius. On some recent discoveries of fields of Iron-ore in the South of Russia. *Chem. News*, vol. xxxiii. no. 842, p. 12.

Gives analyses of iron-ore from the rivers Ingouletz and Saksagane. The new fields of ore are estimated to contain 90 million tons of red and brown hæmatite and magnetite. F. W. R.

Kitton, F. On the Origin of Flint. (Norwich Geol. Soc.) *Eastern Daily Press*, April 7.

Considers that the Chalk-flints have a spongious origin, and that the flint-bands may have been due to the former presence of layers of protoplasm similar to those which have been found to occur on the surface of calcareous ooze at the bottom of the sea. Maintains that the decomposition of this organic matter caused a deposition of silica, as evidenced by the sponges which have led to the formation of the flint-nodules.

H. B. W.

Klein, Carl. Einleitung in die Krystallberechnung. [Introduction to Crystallographic Calculations.] Pp. vi, 394; 12 plates, 196 woodcuts. 8vo. *Stuttgart.*

——. [Humite.] *N. Jahrb.* Heft vi. pp. 633–635; woodcut.

Crystallographic and optical examination of two crystals of humite from Vesuvius, belonging to type III. The results show that they are not rhombic, but clinorhombic. This agrees with E. S. Dana's conclusions from the examination of crystals of types II. and III. from the Tilly Foster Mine. F. W. R.

Kloos, J. H. [Hemimorphism of Calcite.] *N. Jahrb.* Heft iv. pp. 413–415.

Crystals of calcite from Brigels, Tavitschthal, exhibit hemimorphism; thus some are terminated at one end by the scalenohedron R3, and at the other by the rhombohedron $-\frac{1}{2}$R. Believes this to have been previously unobserved. F. W. R.

Knop, Dr. A. System der Anorganographie. [System of Anorganography.] Pp. xxviii, 296. 8vo. *Leipzig.*

——. Zur Verständigung über Pachnolith und Kryolith. [On Pachnolite and Cryolite.] *N. Jahrb.* Heft viii. pp. 849–854.

Two varieties of pachnolite have been described; and analyses are here collected from different authors to show their identity. Wöhler has separated "var. A" under the name of *Pyroconite*. König's *Thomsenolite* is identical with pachnolite. Knop and Vom Rath have regarded pachnolite as probably rhombic; Des Cloizeaux and Dana as monoclinic; and Websky as triclinic. F. W. R.

Lasaulx, A. von. [New Minerals.] *N. Jahrb.* Heft ii. p. 175.

Preliminary description of Melanophlogite and Aerinite (see below).

——. Mineralogisch-krystallographische Notizen. [Mineralogico-crystallographic Notes.] Erste Folge. *N. Jahrb.* Heft iii. pp. 250–278, plate; and Heft iv. pp. 352–368.

Melanophlogite is a new species containing 86 p. c. of silica, with water and sulphuric acid. It crystallizes in minute white or light-brown cubes, having H=7 and S. G. =2·04. Becomes black, B. B., whence the name. It occurs with calcite and celestine on the sulphur

of Girgenti, in Sicily. The other notes describe a pseudomorph of calcite after rhombohedral dolomite from Traversella; crystals of quartz, with indented edges, from Oberstein and from Lisso, near Bologna; and crystals of cuprite showing similar irregularities from Cornwall.

The second part contains descriptions of two new species, and a note on ardennite. *Aërinite* is a bright blue compact hydrous silicate, in which the bases are chiefly the two oxides of iron. It is a product of decomposition, and is intimately associated with fragments of quartz, olivine, felspar, and augite. Probably the mineral was obtained from Spain. *Pilinite* is a new species from the granite of Striegau, occurring in fine needles, and having the following composition: $2CaO . Al^2O^3 . 5SiO^2 . H^2O$. F. W. R.

Lasaulx, A. von. [Mineralogical Notices.] *N. Jahrb.* Heft iv. p. 409–411.

Describes (1) twin-crystals of Chabasite from Striegau, formed according to the law—twin-plane a face of R, twin-axis a normal to R; (2) a kind of elastic bitumen from S. Australia; (3) growth of garnet and calcite in the porphyry of Rathen, in Silesia. F. W. R.

——. [Mineralogical Notes.] *N. Jahrb.* Heft vi. pp. 623–633.

Further remarks on the new species melanophlogite and pilinite. Description of the microscopic structure of fibrous blende (*Spiauterite*) from Przibram and from Albergaria Velha. The former consists mainly of doubly-refracting hexagonal wurtzite, mixed probably with regular blende; the latter is throughout isotropic, and therefore not referable to wurtzite. Microscopic examination of certain garnets shows the presence of a doubly refracting substance (Vesuvian ?). The typical colophonite of Arendal is a mixture of Vesuvian and garnet, the former prevailing. F. W. R.

Laspeyres, H. [New Nickel-mineral.] *N. Jahrb.* Heft vii. p. 737.

Gives the name *Polydymite* to a nickel-ore which contains R_4S_5, and occurs in polysynthetic twins of regular octahedra. Nickel-bismuth-glance (Saynite) is not an independent species, but a mixture of bismuth-glance and polydymite. F. W. R.

Laur, Fr. Les Calamines: Etude sur les minerais oxydés du zinc. [Calamine.] *Bull. Soc. Indust. Min. St. Etienne,* 2 sér. t. iv. p. 275.

Lea, Isaac. Further Notes on "Inclusion" in Gems. Pp. 11. 8vo. *Philadelphia.*

Leidy, Prof. Remarks on the Structure of Precious Opal. *Proc. Ac. Nat. Sci. Philad.* p. 195.

Lemberg, J. Ueber Silicatumwandlungen. [Alteration of Silicates.] *Zeitsch. deutsch. geol. Ges.* Bd. xxviii. Heft 3, pp. 519–621.

Gives analyses of felspars in tourmaline-granite and red porphyry of Predazzo, and laboratory experiments illustrating the decomposition

affecting only the oligoclase, &c.; analyses of Grodno sandstone and adjacent porphyry are compared. Dolomitization is shown by the action of magnesic chloride on calcic carbonate. The absence of zeolites in granites is exemplified by a series of experiments on the action of alkaline salts on leucite, nepheline, &c.; an artificial silicate with the composition of analcime was formed by sodium salts acting on leucite; and this was reformed by treating analcime with potash salts. A genetic relationship between Gmelinite and Herschellite is proved by experiments; also between mesolite and natrolite. A compound similar to Edingtonite was formed, and substitutions effected in chabasite, Thompsonite, stilbite, &c. From experiments on kaolin, &c. it is deduced that the action of soils is a purely chemical one, a silicate varying according to the salts which percolate through it; ammonia salts are shown to act on silicates like other alkalies, so that no intervention of humus is necessary. A mineral from Vesuvius is analyzed, and shown to be a lime-cancrinite, or anorthite with carbonate of lime. Pyrochemical reactions illustrate the genesis of the sodalite group. Again the relation of pachnolite and arksutite is elucidated by the action of calcic chloride on cryolite. E. B. T.

Leuchtenberg, Duke N. de. Les propriétés de la Leuchtenbergite sous le microscope dans son état pur et métamorphosé. [Leuchtenbergite, original and altered.] *Bull. Ac. Imp. Sci. St. Pétersbourg*, t. xxii. pp. 502–512.

——. Mikroskopische Beschaffenheiten des grünen Avanturins aus Indien. [Microscopic Structure of Green Avanturine from India.] *Bull. Ac. Imp. Sci. St. Pétersbourg*, t. xxii. p. 512.

Lill, — von. Analysen, ausgeführt im Laboratorium des k. k. General-Probiramtes in Wien in den Jahren 1875 und 1876. [Analyses of Minerals and Rocks.] *Jahrb. k.-k. Berg-Akad.* Bd. xxiv. no. 4, pp. 328–340.

Liversidge, Prof. A. The Minerals of New South Wales. *Trans. R. Soc. N. S. Wales*, vol. ix. pp. 153–215.

A catalogue, comprising 65 metallic and 81 non-metallic minerals and their varieties. Some analyses are given; and the localities are named, with notes on the mode of occurrence and other characters of the species. R. E.

Lundström, C. H. Analys af ett egendomligt talksilikat från Nordmarken. [Analysis of a peculiar Magnesian Silicate from Nordmark, Sweden.] *Geol. Fören. Stockholm Förh.* Bd. iii. pp. 191, 192.

The analysis leads to the formula $3MgO+2SiO^2+2HO$, a composition agreeing fairly well with that of the serpentine.

McCreath, Andrew S. Report of Progress in the Laboratory of

the Survey at Harrisburg. *Second Geological Survey of Pennsylvania.* Pp. viii, 106. 8vo. *Harrisburg.*

Maskelyne, Prof. N. S. Crystallography—Mineralogy. Handbook to the Special Loan Collection of Scientific Apparatus, pp. 304–320.

Refers especially to the measurement of crystals.

Meissonnier, —. Sur l'existence, en Espagne, d'un gisement de minerais de Nickel analogues à ceux de la Nouvelle-Calédonie. [Occurrence of Nickel-ores in Spain like those of New Caledonia.] *Compt. Rend.* t. lxxiii. p. 229.

Miller, W. H. On a new form of the Reflecting Goniometer. *Phil. Mag.* ser. 5, vol. ii. pp. 281–285.

Describes the instrument, and points out its advantages over previous forms. Discusses methods of obtaining bright and faint signals.

Moiser, H. R. On Quartz. *Naturalist*, ser. 2, vol. i. pp. 161, 162. Abstract.

Chemical and crystallographical description, colouring matters, and origin noticed.

Morgan, Alfred. A note on the theory of metalliferous deposits in veins. *Proc. Liverpool Geol. Soc.* vol. iii. pt. ii. pp. 90–93.

Refers to experiments of R. Hunt, in which unstable equilibrium in a chemical solution was sufficient to produce metalliferous deposition on surfaces widely separated. C. E. R.

Neminar, Dr. Edmund F. Die Krystallform des Barytocölestins. [Crystallization of Barytocelestine.] *Min. Mitth.* Heft i. pp. 59–64; 2 woodcuts.

A study of the crystalline form of *Barytocelestine* from the Binnenthal, Switzerland; and a comparison with the forms of barytes and celestine. Concludes that barytocelestine is independent, and does not stand between barytes and celestine in its crystalline forms. F. W. R.

——. Minerale aus dem nordwestlichen Theile Schlesiens. [Minerals from N.W. Silesia.] *Min. Mitth.* Heft ii. pp. 141, 142.

Note on occurrence of garnet, vesuvian, staurolite, and magnetite.

Nordenskiöld, A. E. Kupferpecherz från Ural. [Pitch Copper-ore from Ural.] *Geol. Fören. Stockholm Förh.* Bd. iii. pp. 117, 118.

Analyses given. It is thought possible that the substance has a composition represented by the formula:—

$$5\dot{R}^2 \left\{ \begin{matrix} \ddot{S}i \\ \ddot{C} \end{matrix} \right. + 2\ddot{F}^2H^3 + HO.$$

E. E.

—— . Meddelanden i mineralogi. [Notes on Mineralogy.] *Geol. Fören. Stockholm Förh.* Bd. iii. pp. 226–229.

I. Thorite from the felspar-quarries near Arendal in Norway. This mineral, hitherto found only at Brevig in Norway, occurs at the new locality as large brown crystals, with fergusonite and orthite, usually attached to plates of black mica, and surrounded by ochre-tinged orthoclase. Analysis given.—II. Cyrtolite from Ytterby in Sweden. Occurs together with fergusonite, xenotime, and arrhenite. Analysis given. The composition shows a relationship with the American cyrtolite and the malakone from Björkboda, Sweden. E. E.

Paijkull, S. R. Homilit, ett mineral från Brevig i Norge. [Homilite, a Mineral from Brevig in Norway.] *Geol. Fören. Stockholm Förh.* Bd. iii. pp. 229–232.

Analyses given. The mineral is closely related to datolite. Occurs together with melinophane and erdmannite. Its formula is:—

$$3(CaO, FeO)+2SiO^2+BO^3.$$ E. E.

Paterson, G. Analysis of an Iron Deposit. *Chem. News*, vol. xxxiv. no. 885, p. 198.

Analysis of a deposit from the surface of the Lochar Moss, on the Solway Firth. It contains 50·74 per cent. of organic matter and water, with 43·29 per cent. of ferric oxide. It is largely made up of *Didymohelix ferruginea*, with a small proportion of amorphous ferric oxide. F. W. R.

Phillips, J. A. Some Recent Metallurgical Processes. *Journ. Soc. Arts*, vol. xxiv. no. 1215, p. 284.

Gives an analysis of cupreous pyrites from San Domingo, Portugal (p. 285).

Phipson, Dr. Brown crystals of Calcite. *Chem. News*, vol. xxxiii. no. 845, p. 56.

Dark liver-coloured calcite, occurring in white quartz near Helensburgh, on the Clyde, was found to leave, on solution, about 5 p. c. of brown residue, chiefly oxide of manganese with peroxide of iron. F. W. R.

Pichler, A. Aus dem Quartzphyllit bei Innsbruck. *N. Jahrb.* Heft ix. p. 923.

Announces the occurrence of fluor-spar and antimonite in quarries of quartz-phyllite S. of Innsbruck.

Plant, John. Vivianite at Barton-on-Irwell. *Trans. Manch. Geol. Soc.* vol. xiv. pt. ii. p. 78.

Describes a metatarsal bone of a deer from peat beds, impregnated with this mineral.

Popov, —. [Analysis of Titaniferous Iron, &c.] *Gornoi Journ.* vol. iii. pp. 300–313.

Rammelsberg, C. Ueber die Zusammensetzung des Leukophans und des Melinophans. [Leucophane and Melinophane.] *Zeitsch. deutsch. geol. Ges.* Bd. xxviii. Heft 1, pp. 57–63; and *Monatsb. k. preuss. Ak. Wiss.* pp. 22–26.

The rarity of melinophane has hitherto prevented fresh analyses; it is shown that glucina was mistaken for alumina: new results give percentages from which is deduced the formula

$$6NaFl+7\left\{\begin{matrix}RSiO_3\\R^2SiO^4\end{matrix}\right\},$$

while that of leucophane from new analyses is declared to be

$$6NaFl+\left\{\begin{matrix}13RSiO_3\\R^2SiO^4\end{matrix}\right\}.$$

E. B. T.

——. Ueber Aerinit und Ginilsit. *Zeitsch. deutsch. geol. Ges.* Bd. xxviii. Heft 2, pp. 234–237.

Aerinite, a homogeneous mineral, avowedly from Aragon. Sp. gr. 2·671. Analysis suggests the formula $2RSiO_3 . R_2SiO_4$, the basis being lime, magnesia, ferrous and ferric oxide, and alumina. Of *Ginilsite*, from the Ginilsalp (Grisons) a new analysis is here given. E. B. T.

——. Ueber die Zusammensetzung des Nephelins. [Composition of Nepheline.] *Monatsb. k. preuss. Ak. Wiss.* pp. 695–703.

Ramsay, William. On Bismuthiferous Tesseral Pyrites. *Journ. Chem. Soc.* ser. 2, vol. xiv. pp. 153, 154.

Small metallic crystals from an unknown locality, and too small to be measured, were analyzed and found to contain 37·64 p. c. of bismuth. The formula of the mineral is $(Ni, Co, Fe)(As, Bi)_3$; and its sp. gr. 7·55. F. W. R.

Rath, G. vom. Zwillingverwachsung der triklinen Feldspathe nach dem sogen. Periklin-Gesetze und über eine darauf gegründete Unterscheidung derselben. [Twinning of Triclinic Felspar.] *Monatsb. k. preuss. Ak. Wiss.* pp. 147–174, plate.

Crystallographic description, with analyses by the author, **Prof. A. Koch**, and others.

——. Die Zwillingsverwachsung der triklinen Feldspathe nach dem sogen. Periklin-Gesetze und über eine darauf gegründete Unterscheidung derselben. [Twin-growth of Triclinic Felspar according to the "Pericline Law," &c.] *N. Jahrb.* Heft vii. pp. 689–715; plate and 2 woodcuts. Also in *Monatsb. k. Ak. Wiss. Berlin*, Feb.

Various views have been held with respect to the law of twinning in pericline. The author confirms Mohs and Breithaupt in their expression of the law, axis of rotation parallel to the macrodiagonal. Describes peculiar double twins of albite formed according to this law,

and also—axis of rotation the normal to the basis. The macrodiagonal law holds also in anorthite. Concludes, from the character of twin-striation on $\infty\breve{P}\infty$, that certain crystals from Bamle, in Norway, are oligoclase and not anorthite. Finds typical labradorite twinned according to the macrodiagonal law. Shows the value of the direction of twin-striæ as a means of diagnosing the triclinic felspars. F. W. R.

Rath, G. vom. [Crystallization of Leucite.] *N. Jahrb.* Heft iii. pp. 281–285.

Reply to objections of Dr. Hirschwald against the view that leucite crystallizes in the quadratic system. Dwells on his opponent's misconception of polysymmetry; and holds that as polysymmetry is only a special case of dimorphism, it follows that if leucite is polysymmetric it must be dimorphous, and that Hirschwald is wrong in recognizing only one species—the regular. F. W. R.

——. [Mineralogical Notes.] *N. Jahrb.* Heft iv. pp. 386–405; plate.

Occupied chiefly with crystallographic details referring to—(1) small crystals (R . oR) of iron-glance seated on large octahedra of magno-ferrite, from Vesuvius; (2) parallel growth of small crystals of biotite on older and larger crystals of augite, from the eruption of Vesuvius of April 1872, and of crystals of hornblende and of augite similarly placed; (3) twin-crystals of turnerite from Tavetsch and the Binnenthal; (4) crystals of scorodite from Dernbach, Nassau; (5) paramorphs of rutile after Arkansite from Magnet Cove. Also discusses the priority of description of the regular growth of calcite and quartz at Schneeberg, and carries on the discussion as to the crystallization of leucite. F.W. R.

Reid, W. C. Mineral Phosphates and Superphosphate of Lime. *Chem. News*, vol. xxxiv. no. 871, pp. 48–50; no. 872, pp. 55, 56.

1. Contains analyses of Cambridge, Suffolk, and Boulogne nodules; of S. Carolina and Bordeaux phosphates. 2. Contains analyses of phosphate of lime from Nassau, Spain, Norway, and Canada; and of guano from Sombrero and Navassa in the Caribbean Sea. F. W. R.

Reusch, E. Note zur Laspeyres's Abhandlung: Krystallographische Bemerkungen zum Gyps. [Laspeyres's Crystallographic Remarks on Gypsum.] *Min. Mitth.* Heft i. pp. 67, 68.

Roscoe, Prof. [H. E.] Recent Discoveries about Vanadium. *Proc. R. Inst.* vol. viii. pp. 221–230.

Two new vanadium minerals are mentioned, viz. *Mottramite*

$$(CuPb)_3V_2O_8 + 2(CuPb)(OH)_2;$$

and *Roscoelite*

$$4Al'''VO_4 + K_4Si_9O_{20} + H_2O;$$

the latter is a greenish talc-like substance, occurring in cavities in schistose porphyry. R. B. N.

Ross, Major W. A. Blowpipe-analysis of the new mineral Henwoodite. *Chem. News*, vol. xxxiv. no 881, pp. 156, 157.
Describes the blowpipe-characters exhibited by the mineral when examined according to the author's method.

——. Pyrology.—Quantitative Analyses by the Blowpipe. *Nature*, vol. xiv. pp. 130, 131.

Roster, Dr. G. Note mineralogiche su l'Isola d'Elba. [Mineralogical Notes on Elba.] *Boll. R. Com. geol. Ital.* vol. vii. pp. 297–323, 410–437; 6 woodcuts.
The material for these notes is taken chiefly from the Foresi collection at Porto Ferraio, which contains over 400 finely crystallized examples of hæmatite, and others in proportion: those described from the iron and augite rocks are, picroallumogene, blende, cerussite, asbolite, orthoclase, blue vitriol, chrysocolla. In the granite are uranite, arsenical pyrites, magnetite, limonite, epidote, tourmaline. In quartzites, vesuvian, leucopyrite. In serpentine rocks, thulite, opal, giobertite. Of these *picroallumogene* is a n. sp.: its analysis agrees with the formula $2MgSO^4$, $Al^2S^3O^{12}+28H^2O$; crystallographic system probably monoclinic; occurs in radiately fibrous masses.
E. B. T.

Roth, J. Ueber die Wirkung verdünnter Essigsäure auf dolomitische Kalke. [Action of Dilute Acetic Acid on Dolomitic Limestone.] *Min. Mitth.* Heft i. p. 69.

Rutley, Frank. Mineralogy. Revised Edition (2nd). Pp. x, 214. 8vo. *London.*
Some corrections and additions. See Notice of Ed. 1 in the Geological Record for 1874, p. 247.

Sadebeck, A. Ueber die Krystallisation des Diamanten. [Crystallization of Diamonds.] *Monatsb. k. preuss. Ak. Wiss.* pp. 578–587.

Sandberger, F. [Minerals from Bavaria.] *N. Jahrb.* Heft iii. pp. 280, 281.
Announces the occurrence of a mineral in the Heubach, believed to be Frenzel's *Heterogenite*, which is a hydrous proto-peroxide of cobalt; and of a mineral from the Reinerzau, supposed to be identical with the same author's *Chlorotile*. Also notices the Mexican mineral Livingstonite.
F. W. R.

——. [Zinckenite.] *N. Jahrb.* Heft v. pp. 514, 515.
Announces the occurrence of Zinckenite at the Ludwig Mine, near Hausach, in the Black Forest, and gives analyses.

Scacchi, Prof. Microsommite del Monte Somma. 4to. *Naples.*

——. *N. Jahrb.* Heft vi. pp. 637–640; 3 woodcuts.
Crystallographic note on the regular growth of iron-glance and magnetite from Vesuvius.

Scharff, Dr. Friedrich. Ueber die Selbsthätigkeit in ihrer Ausbildung gestörter, sowie im Berge zerbrochener und wieder ergänzter Krystalle. *N. Jahrb.* Heft i. pp. 24–32.
An attempt to show that crystals possess a kind of life.

——. Ueber den inneren Zusammenhang der verschiedenen Krystallgestalten des Kalkspaths. [Interior Crystalline Structure of Calcite.] Pp. 61; 5 pls. 4to. *Frankfort.*

Shepard, Prof. Charles Upham. On Hermannolite, a new species of the Columbium Group. *Amer. Journ.* ser. 3, vol. xi. pp. 140, 141.
Gives an analysis of this new mineral by **Dr. R. Hermann.** The formula is given thus:—

$$2(2RO, 3NbO^2)+(RO, Me^2O^5)II^2O^5=(\tfrac{1}{4}Ta^2O^5+\tfrac{3}{4}II^2O^5).$$

G. A. L.

——. On New Minerals. *Phil. Mag.* ser. 5, vol. ii. pp. 319, 320.
Describes the following:—*Vanuxemite* (massive), a hydrous silicate of alumina and zinc; *Keatingine* (probable new species resembling Fowlerite); *calcozincite* (massive), ZnO, with CaO, CO_2, H_2O; *euchlorite* (massive), a hydrous silicate of magnesia, iron protoxide, and alumina; *Pelhamine*, a mineral resembling serpentine, of the following composition —SiO_2 38·40, Al_2O_3 2·80, FeO 15·52, MgO 39·88, H_2O 3·40. T. G. B.

Silvestri, Prof. O. La scombinazione chimica (dissociazione) applicata alla interpetrazione di alcuni fenomeni vulcanici; sintesi e analisi di un nuovo minerale trovato sull' Etna e di origine comune nei vulcani. [Dissociation as explanatory of some Volcanic Phenomena; a new mineral from Etna, common in volcanoes.] *Atti Ac. Gioen. Sci. Nat.* ser. 3, t. x. pp. 17–27.
Describes certain experiments, and gives analyses of iron nitride (not new) of formula Fe_5N_2.

——. Sopra alcune Paraffine ed altri Carburi d'Idrogeno omologhi che trovansi contenuti in una Lava della Etna. [Paraffin and other Hydrocarbons in a Lava from Etna.] 4to. *Catania.*

Sjögren, A. Mineralogiska notiser. III. Manganosit och pyrochroit funna i Mossgrufvan å Nordmarksfältet i Vermland. [Mineralogical notes. III. Manganosite and Pyrochroite found at the Moss-mine in the Mining-district of Nordmark, Vermland, Sweden.] *Geol. Fören. Stockholm Förh.* Bd. iii. pp. 181–183.
Describes the mode of occurrence.

Smith, J. L. Gas Wells in Pennsylvania. *Ann. Chim. Phys.* t. viii. p. 566; Abstract in *Proc. Inst. Civ. Eng.* vol. xlvi. pp. 355, 356.
Analyses of natural gases.

——. Aragonite on the surface of a meteoric iron, and a new mineral (Daubréelite) in the concretions of the interior of the same. *Amer. Journ.* ser. 3, vol. xii. pp. 107–110; *Chem. News*, vol. xxxiv. no. 875, pp. 87, 88.
The first mineral is shown by physical characters and analysis to be aragonite; and the author regards it as formed subsequently to the fall of the meteorite. The second is a black lustrous crystalline mineral of the composition—sulphur 37·62, chromium 62·38. T. G. B.

Sohncke, Dr. Leonhard. Die unbegrenzten regelmässigen Punktsysteme als Grundlage einer Theorie der Krystallstruktur. [The unlimited regular Dot-system as a Foundation of a Theory of Crystal-structure.] *Verh. nat. Ver. Karlsruhe*, Heft vii. pp. 83; 2 pls.

Sorby, H. C. On some hitherto undescribed Optical Properties of Doubly Refracting Crystals. *Proc. R. Soc.* vol. xxvi. pp. 384–386.
Preliminary notice of a new refractometer, as described by Dr. Royston-Pigott in vol. xxiv. p. 393, the principle of which the author considers might, with advantage, be applied to the determination of the index of refraction of minerals. R. B. N.

Sorby, H. C., and **P. J. Butler.** On the Microscopical Structure of Amber. *Micr. Journ.* vol. xvi. pp. 225–231, pl. clviii.
Very thin sections of this substance exhibit many cavities from $\frac{1}{1000}$ to $\frac{1}{30000}$ of an inch in diameter. For convenience these are divided into three kinds:—1, filled with fluid; 2, containing both liquid and gas; 3, filled with gas. The probable mode in which these cavities have been formed is investigated, and also the behaviour of the various parts of the section under polarized light. The important bearing of this examination upon the study of the minute cavities in minerals is noticed. E. T. N.

Soret, J. L., and **E. Sarasin.** Sur la Polarisation rotatoire du Quartz. [Rotary Polarization of Quartz.] *Arch. Sci. Phys. Nat.* t. liv. pp. 253–264. [From Abstract in *Phil. Mag.* ser. 5, vol. ii. pp. 475, 476.]
Describes the results of experiments on the light of sodium, and tabulates the measurements for the solar lines D_1 and D_2, by Fizeau and Foucault's method. T. G. B.

Spiller, John. On the occurrence of native Calcium Chloride at Guy's Cliffe, Warwickshire. *Journ. Chem. Soc.* ser. 2, vol. xiv. pp. 154–159.

A black slime on Keuper sandstone was found to contain calcium chloride 27·15, sodium chloride 11·03, potassium chloride 1·21, calcium sulphate 14·55, water and vegetable extractive matter 42·25. It is the only recorded instance of native chloride of calcium in Gt. Britain. Its origin is unknown. An analysis of the greyish-white micaceous sandstone is also given. F. W. R.

Stelzner, Alfred. [Trapezohedral Quartz.] *N. Jahrb.* Heft iv. pp. 416.

Against the author's views on the origin of trapezohedral quartz, Frenzel has objected that this mineral is a young formation in the Schneeberg lodes. Stelzner uses this argument in his own favour. The quartz was contemporaneous with the fluor-spar, and was formed in cavities which contained solutions of fluorine compounds. F. W. R.

Streng, A. Ueber Augit- und Adular-Krystalle. [Crystals of Augite and Adularia.] *N. Jahrb.* Heft ii. pp. 178–180.

Describes some remarkable crystals of augite from Nordmark in Sweden, and of adularia from Cavradi in the Tavetsch, Switzerland.

——. [New Mineral.] *N. Jahrb.* Heft viii. pp. 854, 855.

Note on the cacoxene of the Bieberthal, near Giessen. Announces the occurrence with it of a new mineral resembling scorodite, but containing P instead of As. It was formerly taken for manganese-spar, but has been found by A. Nies to be a ferric phosphate. F. W. R.

Struever, G. Studi sui minerali del Lazio. [Minerals of Latium.] Parte I. *Atti R. Ac. Linc.*, Jan. 2; 2 plates. Noticed in *Boll. R. Com. geol. Ital.* vii. pp. 85, 86, 252, 253.

The materials are drawn from the Spada and Riccioli collections in the museum of the Roman University, supplemented by the author's researches: the chief species illustrated are sulphur, magnetite, pleonaste, Hauyne, lapis lazuli. E. B. T.

Strüver, J. [Alban Minerals.] *N. Jahrb.* Heft iv. p. 413.

Note on the author's studies of the minerals of the Alban Mountains.

Szabo, Dr. J. [On a new Method of Determining the Species of Felspars in Rocks.] Pp. 88; 5 pls. 8vo. *Budapest.*

Depends on fusibility and flame-coloration.

Tennant, Prof. J. Notes on the South-African Diamonds. *Rep. Brit. Assoc.* for 1875, *Sections*, p. 82.

About 10 p. c. are 1st class, 15 p. c. 2nd class, 20 p. c. 3rd class; the remainder (called "bort") are used for cutting-purposes. The value of the diamonds found from March 1867 to 1875 exceeds £12,000,000. W. T.

Thomas, J. W. On the Gases enclosed in Cannel Coals and Jet. *Journ. Chem. Soc.* ser. 2, vol. xiv. pp. 144–152.

Contains analyses of the gases enclosed in Wigan cannel, Scotch cannels, and Whitby jet. The cannels differ from the bituminous, anthracitic, and steam coals previously examined, in that they enclose hydride of ethyl, and most probably C_3H_3, and all the gases of the paraffin series. F. W. R.

Trautschold, H. [Siberian Minerals.] *N. Jahrb.* Heft vi. pp. 635, 636.

Notes on minerals received from gold-washings in E. Siberia, including samples of *black-gold*. These are found to consist of brilliant nuclei of gold surrounded by a dark-coloured incrustation. F. W. R.

Trechmann, Dr. Ch. O. Beiträge zur Kenntniss des Turnerit. [Turnerite.] *N. Jahrb.* Heft vi. pp. 593–601; plate.

Examination of crystals of Turnerite from the Binnenthal and the Tavetschthal. Gives a table of forms, and compares them with those of Monazite. $-\frac{3}{5}\overline{P}\infty$ is new for Turnerite. The axial ratios are $a:b:c = 0{\cdot}958444 : 1 : 0{\cdot}921696$. $\beta = 77° 18'$. The Binnenthal crystals were too opaque to allow of determination of their optical constants. The Tavetsch crystals were partially examined. Dispersion in oil $\rho < \nu$. For red $\mu = 1{\cdot}4706$, for green $= 1{\cdot}47475$. $2E = 34° 12'$ red, $34° 48'$ green. Pleochroism was determined. The crystals were too small and rare for quantitative analysis; but the presence of phosphoric acid and cerium was determined. Not sufficient material for taking sp. gr. F. W. R.

Tschermak, [Prof.]. Entstehung einer schaligen Textur im Steinsalz durch Schlag. [Development of a Shaly Texture in Rock-salt by Impact.] *Min. Mitth.* Heft iv. pp. 242, 243; part of plate and 2 woodcuts.

Rock-salt from Szlatina in the Marmaros contains small cup-shaped concretions (*Näpfchen*), which, like the surrounding mass, consist only of salt. They exhibit a concentric shaly structure, which has probably been developed by blows of the hammer in working the salt. The heat resulting from impact may have aided it, but was not sufficient to fuse the salt, as has been suggested. F. W. R.

T[schermak ?]. Verwandlung von Grammatit in Talk bei Gegenwart von Olivin. [Alteration of Grammatite into Talc in Presence of Olivine.] *Min. Mitth.* Heft i. pp. 65, 66.

Note on occurrence of talc pseudomorphous after grammatite, and associated with olivine partially altered into serpentine. Observed by Dr. Fuchsofer in the Koralp, Carinthia. Notable for its bearing on the genesis of serpentine. F. W. R.

——. Ueber Leucite. *Min. Mitth.* Heft i. pp. 66, 67.

A properly-cut section of leucite from the lava of Acquacetosa, near Rome, was dark in parallel-polarized light, showed a cross in converging light, and tested with the mica-plate was found to be negative. An analysis of the mineral given. F. W. R.

T[schermak ?]. Biotitzwillinge von Vesuvius. [Biotite-twins from Vesuvius. *Min. Mitth.* Heft iii. p. 187.

Differs from Vom Rath as to certain twin-crystals. Holds that all Vesuvian biotite is monoclinic, not rhombohedral. Twins are constituted with twin-face $\bar{3}31$. F. W. R.

Typke, P. G. W. On a new Nickel Mineral from New Caledonia. *Chem. News*, vol. xxxiv. pp. 193, 194.

This nickel-ore is not homogeneous. The separation and analysis of the more important constituent, an apple-green mineral, lead to the conclusion that it is a hydrated nickel disilicate of the formula $Si_2O_6NiH_2$. The author points out wherein this differs from other analyses, and concludes that the mineral probably results from the action of hydrated or soluble silicic acid upon some nickel compound, producing products of variable composition. F. W. R.

Ulrich, G. H. F. Selwynite, Noumeïte, Garnierite. *Amer. Journ.* ser. 3, vol. xi. p. 235. (Note dated Nov. 3, 1875.)

Urba, Dr. K. Krystallographische Tafeln. iii Aufl. [Crystallographic Plates.] Ed. 3. 8vo. *Prague.*

18 plates of drawings of crystals, mostly with Naumann's symbols, some figures with Dana's; no letterpress.

Uzielli, G. Sopra lo zircone della costa tirrena. [Tuscan Zircon.] *Atti R. Ac. Linc.* Pp. 18.

On zircon from the Tyrrhenian coast.

——. Sopra la baritina e il ferro oligisto di Calafuria; e sulla pirrotina della miniera del Bottino. [Barytes and Specular Iron of Calafuria, and Pyrrhotine of the Bottino Mine.] *Atti R. Ac. Linc.* Pp. 8.

W[atts ?], H. M. Blowpipe-analysis of the new mineral Henwoodite. *Chem. News*, vol. xxxiv. p. 173.

Letter pointing out that what Major Ross has described as a "new test for cupric phosphate" is an old method due to Berzelius, who used metallic lead, whilst Ross uses oxide of lead. F. W. R.

Websky, Prof. Ueber die Relation der Winkel zwischen vier Krystallflächen in einer Zone und die der Winkel zwischen vier Kanten in einer Fläche. [The Relation of the Angle between 4 Planes in one Zone with that between 4 Edges in one Plane.] *Monatsb. k. preuss. Ak. Wiss.* pp. 4–21.

Wholly mathematical.

——. Ueber Isomorphie und chemische Constitution von Liëvrit, Humit, und Chondrodit. [Isomorphism and Composition of Liëvrite, Humite, and Chondrodite.] *Monatsb. k. preuss. Ak. Wiss.* pp. 201–210.

Websky, Prof. Ueber Beryll von Eidsvold in Norwegen. [Bery from Eidsvold, Norway.] *Min. Mitth.* Heft ii. pp. 117, 118.
A crystallographic description.

Weisbach, A. [Growth of Calcite and Quartz.] *N. Jahrb.* Heft ii. pp. 171–174.
Claims priority for Breithaupt's observations on the regular growth of crystals of calcite and quartz in Saxony.

——. [Growth of Calcite and Quartz.] *N. Jahrb.* Heft vii. pp. 730–733.
Controversial letter supporting Breithaupt's claim to priority in enunciating the law of the regular growth of calcite and quartz.

Widman, O. Ett bidrag till Kännedomen om Kondroditens sammansättning. [Contribution to the Knowledge of the Composition of Chondrodite.] *Geol. Fören. Stockholm Förh.* Bd. iii. pp. 113–115.
Analysis given. Suggests that the formula ought to be written thus:—
$$n(5MgO \cdot 2SiO^2) + 5Mg\,Fl^2\,2Si\,Fl^4.$$

Wiik, F. J. Analyser af finska mineralier utfönda på universitetets kemiska laboratorium under ledning af Prof. J. J. Chydenius. [Analyses of Finland Minerals.] *Öfv. Finska Vet.-Soc. Förh.* Bd. xvii. pp. 69–76.
Chemical analyses given of the following minerals—white felspar (orthoclase), scapolite, spodumene, malacholite, green malacholite (two localities), green pyroxene, black pyroxene, hypersthene, hornblende-anthophyllite, a steatitic mineral and dolomite. E. E.

Williams, Edward H. On crystals of Tourmaline with enveloped Orthoclase. *Amer. Journ.* ser. 3, vol. xi. pp. 273–275, figs. in text.
The specimens described come from a quarry 5 miles W. of Port Henry, N.Y., and seem to point to simultaneous crystallization.

Zängerle, M. Lehrbuch der Mineralogie. 8vo. *Brunswick.*

Z[ezi], P. Le nuove specie minerali studiate e descritte negli anni 1873–75. [New species of Minerals studied and described in 1873–75.] *Boll. R. Com. geol. Ital.* vol. vii. pp. 54–76, 155–164, 238–248.
A continuation of descriptions of new species of minerals, collected and translated from various foreign journals in those years.

See also:—

Graham, Walter. Ores of Tin and Zinc: p. 200.

Phillips, J. A. Copper-ores: p. 200.

Smyth, W. W. Metallic Minerals: p. 199.

MINERAL WATERS.

Fresenius, R. Analyse der fünf Eisen-Quellen in Bad Neudorf in Böhmen. [5 Iron-Springs, Neudorf, Bohemia.] 8vo. *Wiesbaden.*

——. Analyse der Mineral-Quelle bei Birresborn in der Eifel. [Mineral Spring in the Eifel.] 8vo. *Wiesbaden.*

——. Analyse der warmen Quelle zu Assmannshausen. [Thermal Spring at Assmannshausen.] 8vo. *Wiesbaden.*

——. Chemische Analyse der Mineral-Quelle bei Biskirchen im Lahnthale. [Mineral Spring in the Lahn Valley.] 8vo. *Wiesbaden.*

Godefroy, Dr. Rich. Das Fischauer Badewasser. [The Fischau Spa.] *Zeitsch. allgem. österr. Apothek.-Ver.* Bd. xiv. no. 16.

Heinrichs, Prof. On Waters of deep-lying rocks of Iowa, resembling the waters of the sea. *Nature*, vol. xv. p. 303.

Hirschfeld, Dr., and **Dr. Pichler.** Die Bäder, Quellen und Curorte Europa's. [The Baths, Springs, and Health-Resorts of Europe.] 2 vols. *Stuttgart*, 1875–1876.

Jervis, William. Guida alle acque minerali d'Italia, Provincie meridionali. [Guide to the Mineral Waters of S. Italy.] Pp. 320; 14 plates. 8vo. *Turin.*

Loebisch, Dr. W. F., and **L. Sipöcz.** Analyse des Wassers vom "Mare Morto" auf der Insel Lacroma. [Analysis of Water of the "Dead Sea" on the I. of Lacroma.] *Min. Mitth.* Heft iii. pp. 171–174.

Sp. gr. of the water at 17°·6 C.=1·0245. Results of analysis tabulated as (in 10,000 parts of water) NaCl 222·7060, $MgCl_2$ 42·4634, $CaCl_2$ 10·9663, $MgBr_2$ 0·9650, $MgCO_3$ 3·1835, K_2SO_4 7·8340, and Na_2SO_4 29·3204. F. W. R.

Ludwig, E. Chemische Analyse der Darkauer jodhaltigen Salzsoole. [Analysis of the Iodine-saline Spring of Darkau.] *Min. Mitth.* Heft ii. pp. 119–132.

The mineral water at Darkau, in Austrian Silesia, had a temp. of 11°·75 C., that of the air being 6° C. Its sp. gr. is 1·01865. Details of analysis are given. It contains ·002256 p. c. of iodine, and ·01097 of bromine. Gas extracted from the water contained 25·64 p. c. of CO_2, 51·74 of CH_4, and 22·62 of N. Free gas is also disengaged from the spring; and of this ananalys is is given. The same constituents are present as in the dissolved gas. The water is notable for its exceptional richness in bromine. F. W. R.

Moore, Dr. J. M. The Mineral Springs of California. *Homœopathic World*, vol. xi. pp. 75–78.

General composition, temperature, and medicinal values are mentioned. (See also vol. x. p. 548, 1875.)

Pryor, R. A. On the supposed Chalybeate Spring at Watford, and on other Medicinal Waters in Herts. *Trans. Watford Nat. Hist. Soc.* vol. i. pt. 4, pp. 109–111.

References to and quotations from works previous to 1831, mentioning mineral waters at Walton, Barnet, Northaw, Welwyn, Broadfield, and Clothall. The notice in the National Gazetteer of Great Britain and Ireland of a mineral spring at *Watford* is probably an error in copying. W. H. D.

Than, Carl. Analyse der Harkányer Therme. [Analysis of the Thermal Spring of Harkány.] *Min. Mitth.* Heft i. pp. 1–12.

The thermal waters of Harkány in Hungary are noteworthy for containing carbon oxysulphide (COS), a gas discovered by Than. The temperature of the water is 62°·6 C., and the sp. gr. at 20° C. 1·00076. Details of analysis are given. A litre contains 6·81 c. c. of the oxysulphide of carbon in solution. On exposure to air the oxysulphide decomposes thus : $COS+H_2O=CO_2+H_2S$. The spring is further notable for containing ·02061 p. c. of Na_2CO_3, and ·01297 p. c. of Na_2SiO_3. The proportion of iodides and bromides is likewise high. Gas is abundantly discharged from the spring, and burns with a yellowish-blue flame. Analysis of this gas is given. The constituents are COS, CO, CO_2, N, H, and CH_4. F. W. R.

Thorpe, Prof. T. E. A contribution to the History of the Old Sulphur Well, Harrogate. *Phil. Mag.* ser. 5, vol. ii. pp. 50–58.

Gives a detailed analysis of the water, and a comparison with earlier analyses. The amount of soluble matter has varied since 1783. The proportion of potash has much diminished of late years. The amount of barium salt is unusually large, and appears to be increasing. F. D.

PALÆONTOLOGY.

1. *VERTEBRATA.*

Allen, J. A. Description of some remains of an Extinct Species of Wolf and an Extinct Species of Deer from the Lead Region of the Upper Mississippi. *Amer. Journ.* ser. 3, vol. xi. pp. 47–51.

The new species *Canis Mississippiensis* and *Cervus Whitneyi* are described. The specimens form part of a collection of mammalian remains from the lead-crevices and superficial strata of the lead-region of Wisconsin, Iowa, and Illinois. G. A. L.

——. The American Bison, Living and Extinct. *Mem. Mus. Harvard Coll.* vol. iv. no. 10, pp. 246; 12 plates and map.

Describes *Bison latifrons*, Leidy, and *B. antiquus*, Leidy (=*B. crassicornis*, Richardson), both extinct.

Anon. Album de Paléontologie du Bassin Parisien (La Seine aux Ages anté-historiques). 4to. *Paris*, 1876? (not dated). No text, 78 plates.

Baily, W. H. Description of a new species of Labyrinthodont Amphibia from the Coal at Jarrow Colliery, near Castlecomer, Kilkenny. *Rep. Brit. Assoc.* for 1875, *Sections*, p. 62.

Side view of skull, detached ramus of mandible, detached teeth, vertebræ, ribs, and limb-bones of *Anthracosaurus Edgei*, n. sp.

Bassani, Fr. Pesci fossili nuovi del calcare eoceno di Monte Bolca. [New Fossil Fish from the Eocene Limestone of Monte Bolca.] *Atti Soc. Ven. Trent. Sci. Nat.* vol. iii. pp. 23–38, plate.

Beneden, Prof. P. J. Van. Les Thalassothériens de Baltringen (Würtemberg). [Thalassotherians of Baltringen, Wurtemberg.] *Bull. Ac. R. Belg.* 2 ser. t. xli. pp. 471–495, plate.

These fossils come from beds deposited in Miocene times, when the Black Sea extended as far as Vienna, Linz, and the Lake of Constance. The remains described are *Squalodon serratum*, Amphitherians, Sirenia, *Platyrhynchus canaliculatus*, *Orcopsis acutidens*, *Delphinus Baltringii*, *Delphinus* sp.?, *Aulocetus molassicus*. G. A. L.

Beneden, Prof. P. J. Van. Un mot sur le *Selache* (*Hannovera*) *aurata* du crag d'Anvers. [*S. aurata* of the Antwerp Crag.] *Bull. Ac. R. Belg.* 2 sér. t. xlii. pp. 294–299, plate.

Concludes that *Hannovera* is the Pliocene representative of the living *Selache*. The plate refers to the male appendix of the latter (*S.*

maxima) containing, implanted in its upper and internal border, the characteristic tooth-like solid bodies which are found fossil in the Antwerp Crag. G. A. L.

Bennett, Dr. G. Notes on the *Chlamydosaurus* or Frilled Lizard of Queensland (*C. Kingii*, Gray), and the discovery of a Fossil Species on the Darling Downs, Queensland. *Papers R. Soc. Tasmania for* 1875, pp. 56–58.

Jaw and teeth of a new extinct species, *Chlamydosaurus Bennettii* (Owen), from the superficial deposits at Gowrie Station, Darling Downs, Queensland, accompanied by parts of the jaws of *Nototherium Mitchelli* and *Diprotodon*. R. E., Jun.

Bettany, G. T. On the genus *Merycochœrus* (Family Oreodontidæ), with Descriptions of two new species. *Quart. Journ. Geol. Soc.* vol. xxxii. pp. 259–273, pls. xvii., xviii.

Skulls from Miocene beds, John-Day's River, Oregon, are minutely described and compared with *Oreodon*. *M. temporalis* and *M. Leidyi* are proposed as new species. A list of Oreodontidæ is given. L. C. M.

Biedermann, Dr. W. G. *Mastodon angustidens*, Cuv. *Abh. schweiz. pal. Ges.* iii. pp. 7, pl. 2.

This species occurs through a thickness of 95 metres in the Winterthur molasse; the present example comes from Veltheim in the upper freshwater molasse (Œningen stage). The parts preserved are chiefly the left side of upper jaw (the tusk has a length of 1·08 metre and a double curve), and the lower jaw with worn incisors (its length 1·29 m., of which the symphysis and incisors occupy 0·7 metre). E. B. T.

Blake, J. F. The Yorkshire Lias (**Tate** and **Blake**). See p. 35.

A section (pp. 243–260) is devoted to the Vertebrates. The Reptiles comprise 16 species, including 1 of *Teleosaurus* and 1 of *Steneosaurus*, 9 of *Plesiosaurus*, and 5 of *Ichthyosaurus*. *Steneosaurus brevior*, *Plesiosaurus propinquus*, *P. longirostris*, and *Ichthyosaurus crassimanus* are described as new. Of Fishes 24 species are recorded, though apparently only 20 are accepted as beyond dispute. None are new. H. A. N.

Böckh, Johann. *Brachydiastematherium transilvanicum*, Bkh. & Maty., ein neues Pachydermen-Genus aus den cocänen Schichten Siebenbürgens. [New Pachyderm, &c.] *Mitth. Jahrb. k. ung. geol. Anst.* Bd. iv. Heft 3, pp. 125–150, pls. 17, 18.

Noticed in the Geological Record for 1875, p. 273, by mistake.

Boulger, Prof. G. S. Note on a Cetiosauroid Tooth. *Proc. W. Lond. Sci. Assoc.* vol. i. pt. iii. pp. 99, 100.

Describes teeth of *Iguanodon* and *Cetiosaurus*, and notes the discovery of two of the latter in the Gt. Oolite, Gloucestershire, and Portlandian, Wilts. W. H. D.

Brandt, J. F. Untersuchungen über das Kaninchen (*Lepus cuniculus*) in antiquarisch-linguistischer, zoogeographischer und paläontologischer Beziehung. [Researches on the Rabbit from a Zoogeographical and Palæontological Point of View.] *Bull. Ac. Imp. St. Pétersbourg*, t. xxi. pp. 1–21.

——. Einige Bemerkungen über die bisher in Russland aufgefundenen drei verschiedenen Arten angehörigen Reste ausgestorbener Nashörner. [Remains of three species of Rhinoceros found in Russia.] *Bull. Ac. Imp. St. Pétersbourg*, t. xxi. pp. 81–84. [Title inserted in the Geological Record for 1875, p. 273.]

R. antiquitatis, *R. Merckii*, and *R. leptorhinus*. The last had its home in W. and S. Europe.

Busk, Prof. G. On the Ancient or Quaternary Fauna of Gibraltar, &c. *Proc. Zool. Soc.* p. 415.

Remains of bear, cat, horse, rhinoceros, stag, ibex, &c. noticed.

Calvin, Prof. S. On seven new species of Palæozoic Fossils found in Iowa; also a probable species of Elephant found in the modified Drift near West Union. *Nature*, vol. xv. p. 303. Notice of Meeting of Academy of Science, Iowa, Jan. 23.

Capellini, Prof. G. Sulle balene fossili Toscane. [Fossil Whales of Tuscany.] *Atti R. Ac. Linc.* t. iii. ser. 2 *a*, pp. 8. Noticed in *Boll. R. Com. Geol. Ital.* vol. vii. pp. 77–79.

——. [Discovery of Fossil Cetacea in Italy.] *Bull. Ac. R. Belg.* sér. 2, t. xli. pp. 957, 958.

The localities are Briatico, Gravina, and Gælatone; and the species are:—*Plesiocetopsis Hupschii*, Van Ben.; *P. Garopii*, V. B.; *Aulocetus*, sp.; and *Pachyacanthus*, sp. G. A. L.

Cope, Prof. E. D. On a Gigantic Bird from the Eocene of New Mexico. *Proc. Ac. Nat. Sci. Philad.* ser. 3, vol. vi. pp. 10, 11.

Tarso-metatarsus. Named *Diatryma gigantea*.

——. On the *Tæniodonta*, a new group of Eocene Mammalia. *Proc. Ac. Nat. Sci. Philad.* ser. 3, vol. vi. p. 39.

Supposed to be intermediate between Edentata and Insectivora. 2 families—Ectoganidæ (molars with several roots) and Calamodontidæ (molars with simple conical roots). See Geological Record for 1875, p. 402. L. C. M.

——. On the Geologic Age of the Vertebrate Fauna of the Eocene of New Mexico. *Proc. Ac. Nat. Sci. Philad.* ser. 3, vol. vi. pp. 63–66. Translated in *Journ. Zool.* t. v. pp. 307–311.

A synopsis of species and formations. The American Eocene rocks are classified thus:—

Formation.	Equivalent.	Locality.	Characteristic Fossils.
Bridger.	M. Eocene.	S.W. Wyoming.	*Palæosyops.* *Tillodonta.* *Dinocerata.*
Wahsatch.	L. Eocene.	N.E. New Mexico, S.W. Wyoming.	*Coryphodon.* *Tæniodonta.* *Phenacodus.* *Diatryma.*

L. C. M.

Cope, Prof. E. D. On some supposed Lemurine Forms of the Eocene Period. *Proc. Ac. Nat. Sci. Philad.* ser. 3, vol. vi. pp. 88, 89.

Mesodonta (suborder) proposed for supposed lemurine mammals of the type of *Tomitherium*. Bunotheria (*olim* Insectivora, Cope) proposed for the order including Creodonta, Mesodonta, Insectivora, Tillodonta, and Tæniodonta. L. C. M.

——. On a new genus of Fossil Fishes. *Proc. Ac. Nat. Sci. Philad.* ser. 3, vol. vi. p. 113.

A fragment of jaw, said to be from phosphatic deposit near Charleston; perhaps allied to *Pachyrhizodus* and *Conosaurus*, is named *Cyclotomodon vagrans*, n. gen. and sp. L. C. M.

——. On a new genus of Camelidæ. *Proc. Ac. Nat. Sci. Philad.* ser. 3, vol. vi. pp. 144–147.

The dental formula of *Procamelus* is I. $\frac{1}{3}$, C. $\frac{1}{1}$, Pm. $\frac{4}{4}$, M. $\frac{3}{3}$. *P. heterodontus*, Cope (see Geological Record for 1874, p. 265), has I. $\frac{3}{3}$, M. $\frac{4}{4}$, and is therefore placed in a new genus, *Protolabis*. The evolution of Camelidæ is discussed. L. C. M.

Davies, W. On the Exhumation and Development of *Omosaurus armatus*, Owen. *Geol. Mag.* dec. ii. vol. iii. pp. 193–197, pls. vii., viii.

Describes the mode of raising and developing, from a huge septarium in Kimmeridge Clay, Swindon, Wilts.

Davis, J. W. On a Bone-bed in the Lower Coal Measures, with an Enumeration of the Fish-Remains of which it is principally composed. *Quart. Journ. Geol. Soc.* vol. xxxii. pp. 332–340.

Geological and palæontological description of the shale immediately above the Better-bed coal. *Hoplonchus* (n. gen.) is proposed for spines resembling those of *Onchus*, but with minute denticles along the posterior margin. L. C. M.

Dawkins, Prof. W. B. On the Mammalia and Traces of Man found in the Robin-Hood Cave [Cresswell Crags.] *Quart. Journ. Geol. Soc.* vol. xxxii. pp. 245–258.

——. [Note on Mr. Plant's Fossil Sacrum from Windy Knoll.] *Proc. Manch. Lit. Phil. Soc.* vol. xv. pp. 149, 150.

Delfortrie, E. Sur quelques Dents de Formes singulières provenant des faluns de Saucats, Gironde. [Singular Teeth from Gironde Miocene.] *Act. Soc. Linn. Bordeaux*, sér. 4, t. i. pp. 31, 32.

Describes 5 forms of teeth of *Trichiurides*. *T. miocœnus* (n. sp.) is proposed.

——. Éclaircissements sur une Mâchoire Fossile provenant du Pliocène Toscan de Volterrano attribuée par M. Robert Lawley au genre *Sphœrodus*. [Fossil Jaw from the Pliocene of Volterrano.] *Act. Soc. Linn. Bordeaux*, sér. 4, t. i. pp. 33–35.

States reasons for assigning this jaw to *Pagrus* (Ctenoid), and not to *Sphœrodus*, as proposed by R. Lawley. (See Geological Record for 1875, p. 284.)

——. Nouvelle preuve à l'appui de la théorie de la filiation et de la transformation des espèces. [New Proof of the Filiation and Transformation of Species.] *Act. Soc. Linn. Bordeaux*, sér. 4, t. i. pp. 37–39.

Describes a fragment of ruminant mandible found in the faluns of Bazas, for which the name *Elaphotherium Domenginei* is proposed. Transitional between the Anoplotheridæ and the Cervidæ. R. B. N.

Dudgeon, P. Note on a New Fossil Foot-Print from the Permian Sandstone of Dumfriesshire. *Proc. R. Soc. Edin.* vol. ix. no. 95, pp. 154, 155, pl. 9.

Describes a new species, *Herpetichnus loxodactylus*, from Locharbriggs Quarry, near Dumfries.

Egerton, Sir P. de M. G. Notice of *Harpactes velox*, a Predaceous Ganoid Fish of a new Genus, from the Lias of Lyme Regis. *Geol. Mag.* dec. ii. vol. iii. pp. 441, 442; see also p. 576.

Describes an imperfect specimen found some years ago. On p. 576 the generic name *Harpactira* is substituted, *Harpactes* being appropriated to a bird. W. H. D.

Ferretti, A. Scoperta paletnologica a San Valentino (Reggio Emilia). [Palæ-ethnological Discovery.] *Boll. R. Com. geol. Ital.* vol. vii. pp. 276, 277.

Notice of discovery of a perforated bone-fragment. It is roughly pentagonal in shape, and attributed to the agency of man, though it comes from undisturbed M. Pliocene beds. The perforation is 7 mm. diameter, and bears no resemblance to the work of lithodomous mollusks. There are other bone fragments associated with it, all having lost their terminations. E. B. T.

Filhol, H. Recherches sur les Phosphorites du Quercy; étude des fossiles qu'on y rencontre et spécialement des Mammifères. [Mammalia of Quercy Phosphate-deposits, &c.] *Ann. Sci. Géol.* sér. 4, t. vii. cah. 2, pp. 220, pls. 10–36.

The following Mammalia from the phosphatic deposits [see p. 64], described mostly from detached jaws, are, from their dentition, &c.,

ranked as new species:—Cheiroptera: *Vespertilio Bouryuignati*, *Amphidozotherium Cayluxi*, n. gen. Rodentia: *Hystrix*(?) *Lamandini*, teeth not preserved, so that the presence of this genus in U. Eocene is not certain; *Theridomys platiceps*, founded on a skull with teeth, and *Issiodoromys minor*. Carnivora: *Amphicyon ambiguus* differs much from the dog in the form of jaw; *Brachycyon Gaudryi* (Filhol, 1872), dentition given, viz. one premolar less than dog; allied both to *Canis* and *Amphicyon*. The skull of *Cynodictis Borieri* (Filhol, 1875) is figured: one of the most powerful carnivora of the deposit; upper jaw has i. 3, c. 1, pm. 3, cr. 1, t. 2; but pm. 4 in lower jaw, or one premolar less than *Amphicyon*: the base of the skull offers mixed characters, some canine, some viverrine, and others peculiar and not found in any living forms. *C. Gryei* shows some relations to Viverridæ; but the facial bones are as in Canidæ; the pterygoid processes are very long. *C. crassidens* has affinity with *Amphicyon*. *C. Leymeriei*; *C. brachyrostris*; *C. curvirostris*, near to *C. robustus* (Filhol, 1872); *C. crassirostris*, a small form near to *C. compressidens* (Filhol, 1872), occurs also in Miocene of Auvergne. *C. ferox*, allied to *Viverra angustidens* (Filhol, 1872), has the points of the carnivorous tooth the most elevated of the genus; *C. intermedius* a small form, the second tubercular tooth constantly small, always present in the type; but in the next form, *C. intermedius viverroides*, it disappears altogether, showing a carnivore with *Cynodictis* form of teeth, but dental formula of *Viverra*; this character seems constant, as it holds in 20 examples, and indicates a passage of Viverroid Canidæ into Viverridæ; *C. gracilis*; *C. leptorhynchus*, known by a skull and numerous jaws, has again leanings towards *Amphicyon*. In *C. compressidens* (Filhol, 1872) the first tubercular has exactly the same shape as the carnivorous tooth, suggesting the existence of forms with 2 or more teeth (as in *Cynohyænodon*); *C. exilis* [see Filhol, *Compt. Rend.*] shows the same feature. *Viverra minima* is a small new form. *Machœrodus insignis*, from portions of canines, is larger than any Miocene examples; *M. bidentatus* (Filhol, 1873)=*Eusmilus perarmatus* (Gerv.) is allied to *Drepanodon*. Fresh material enables a re-description of *Pseudælurus Edwardsii* (Filhol, 1872), which is allied to *Cryptoprocta* of Madagascar: *P. intermedius* is a new species. A skull of *Hyænodon* shows the milk-dentition, and proves that this genus is not marsupial; *H. Heberti*, based on fragmentary jaws, is the largest form yet known; *H. compressus* and *H. Cayluxi* are separated by details of dentition; *Pterodon bi-incisivus*, founded on an upper jaw, has 4 premolars,—also a third molar, which has not been previously found. E. B. T.

Filhol, H. Note sur la découverte d'une dent de Rhinocéros fossile à la Nouvelle Calédonie. [Tooth of Fossil Rhinoceros from New Caledonia.] *Ann. Sci. Nat.* sér. 6, *Zool.* t. iii. p. 1.

Note on a first upper premolar of Rhinoceros, said to have been found in gold-searching. It has all the appearance of being fossil, but does not differ from the Sumatran species. E. B. T.

Flower, W. H. Description of the Skull of a Species of *Xiphodon*, Cuvier. *Proc. Zool. Soc.* part 1, pp. 3–7, pl. i.

Obtained from a rolled and waterworn nodule, from near Woodbridge, Suffolk, and apparently of "Diestian" age, as the matrix resembles the "Box Stones" of the Crag. This skull, which has the teeth in a continuous series, is most nearly allied to Cuvier's *Xiphodon*; it is proposed to distinguish it as *X. platyceps*. E. T. N.

——. The extinct Animals of N. America. *Proc. R. Inst.* viii. pp. 103–125; 3 woodcuts. Translated in *Rev. Sci.* t. xi. pp. 467–477.

Notices some of the more remarkable forms of Tertiary mammals and their relation to the development theory; *e. g.* modification of foot through Eocene *Orohippus*, Miocene *Miohippus*, to recent horse; *Tillodonta*, related to Carnivora, Ungulates, and Rodents; *Dinocerata*, intermediate between Proboscidea and Perissodactyles, &c. E. B. T.

——. On the Extinct Animals of North America. *Pop. Sci. Rev.* vol. xv. p. 276.

——. Hunterian Lectures on the Relation of Extinct to Existing Mammalia, with special reference to the Derivative Hypothesis. *Nature*, vol. xiii. pp. 307, 308, 327, 328, 350–352, 387, 388, 409, 410, 449, 450, 487, 488, 513, 514; vol. xiv. p. 11.

Abstract of the lectures. Special attention is given to the gaps between orders or other large groups, and to the way in which some of these gaps are filled by extinct species. L. C. M.

——. The Uintatherium. *Nature*, vol. xiii. p. 404.

Leidy's name (*Uintatherium*) has priority, though remains of animals referable to the same group were earlier discovered and described (as *Titanotherium*) by Marsh. L. C. M.

Forsyth-Major C. J. Considerazioni sulla Fauna dei Mammiferi pliocenici et postpliocenici della Toscana. [Pliocene and Post Pliocene Mammalia of Tuscany.] *Atti Soc. Tosc. Sci. Nat.* vol. i. fasc. 3, pp. 223–245. [Continuation, see Geological Record for 1875, p. 279.]

On the range and specific differences of some of these mammals.

Garrod, H. A. On the Kangaroo called *Halmaturus luctuosus* by D'Albertis, and its affinities. *Proc. Zool. Soc.* pp. 48–59.

Reference to the extinct genera *Protemnodon*, Ow., and *Sthenurus*, Ow. Considers them to be identical with *Dendrolagus*.

Gaudry, A. Matériaux pour l'Histoire des Temps Quaternaires. [History of Quaternary Times.] Fasc. i. pp. 1–62, pls. i.–xi. 4to. *Paris*.

Preliminary Observations, pp. 5–21; the various genera are passed in review, from Eocene to Recent; and a table is given showing the probable climate of each period. Quaternary Fossils of Mayenne, pp. 23–62. The fossils described are from the quarry of Sainte-Suzanne

(most probably the oldest Quaternary), from the fissure Louverné, and from the caves of Louverné, Rochefort, and Chèvre. E. T. N.

Gervais, Prof. Paul. Remarques au sujet du genre *Phocodon* d'Agassiz. [Remarks on *Phocodon*.] *Journ. Zool.* vol. v. pp. 64–70 ; 2 woodcuts. E. T. N.

Considers Scilla's *Phocodon*, in the Woodwardian Museum, a *Squalodon*, not a *Zeuglodon*. *Phococetus* (n. gen.) is proposed for Delfortrie's *Zeuglodon vasconum*. E. T. N.

——. Crocodile gigantesque fossile au Brésil. [Gigantic Fossil Crocodile of Brazil.] *Journ. Zool.* t. v. pp. 233–236, plate.

A dorsal vertebra of a crocodilian reptile (*Dinosuchus terror*, n. sp.), nearly twice the size of a corresponding vertebra from the largest specimen of *Crocodilus biporcatus* in the Paris Museum. The exact age of this fossilis uncertain ; but it is believed to be either Tertiary or Cretaceous. E. T. N.

——. Remarques au sujet du Mémoire précédent. [Remarks upon the Brontotheridæ of Prof. Marsh.] *Journ. Zool.* vol. v. p. 256.

The Brontotherian genera *Menodus* and *Titanotherium* are allied closely to *Chalicotherium* and *Anisodon* of the European Miocenes ; and the Brontotheridæ should occupy a position between the *Anoplotheria* and *Anthracotheria*. E. T. N.

——. Indices d'un nouveau genre de Mammifères Édentés fossiles dans les Dépôts Eocènes dits de Saint-Ouen. [New Fossil Edentate from the Eocene of St. Ouen.] *Journ. Zool.* vol. v. pp. 424–432, plate.

The most important bone appears to be the calcaneum, which shows certain resemblances to the same bone in *Macrotherium* and *Ancylotherium* ; the other bones are a part of a metatarsal or metacarpal, fragments of a scapula, a lumbar vertebra, and possibly a radius. These remains are supposed to indicate an edentate (the oldest known), *Pervatherium rugosum*, n. gen. and sp. E. T. N.

——. L'Yack (*Bos grunniens*) fossile en Chine. [Fossil Yak from China.] *Journ. Zool.* vol. v. p. 464.

A re-examination of the bones from China, referred to *Bos primigenius*, show that they belong to the Yak, and indicate an individual much larger than the Yaks which have been seen in Europe. Peculiarities of the teeth are pointed out, and a list of fossil mammals from China is appended. E. T. N.

Gervais, P. Nouvelles Recherches sur les Animaux vertébrés dont on trouve les Ossements enfouis dans le Sol, et sur leur Comparaison avec les Espèces actuellement Existantes. Zoologie et Paléontologie Générales. [General Vertebrate Palæontology.] Sér. 2, livr. 15, 16, pp. 25–72, pls. ii., iv., v., vii.–x., xii., xiii.

Describes Lemurs, Pachyderms, Ruminants, Carnivora, Insectivora, Cheiroptera, Rodents, Edentates, Marsupials, Birds, Ophidia, and Sauria from the Quercy phosphate-beds, none new. W. H. D.

Gunn, John. Address to Science Gossip Club, Norwich, 1876, in Report of Proceedings for 1875 and 1876. Pp. 28. 8vo. *Norwich.*

Contains remarks on the Proboscidean and Cervine remains in the Norwich Museum, which are said to exhibit evidence of gradual transition from one species into another. H. B. W.

Günther, Dr. Albert. Contributions to our knowledge of the Fish-fauna of the Tertiary Deposits of the Highlands of Padang, Sumatra. *Geol. Mag.* dec. ii. vol. iii. pp. 433–440, pls. xv.–xix.

The following are new species—*Bagarius gigas*, *Barbus megacephalus*, *Amblypharyngodon*, sp., *Chirocentrus*? *polyodon*, *Notopterus primævus*, and *Hexapsephus*, sp. Besides these there are—*Auliscops sumatranus*=*Protosyngnathus sumatrensis*, Marck, *Pseudeutropius verbeekii*=*Brachyspondylus indicus*, Marck, and *Thynnichthys amblyostoma* =*Sardinioides amblyostoma*, Marck. W. H. D.

Haberlandt, G. Ueber *Testudo præceps*, n. sp., die erste fossile Landschildkröte des Wiener Beckens. [The first Land-tortoise of the Vienna Basin.] *Jahrb. k.-k. geol. Reichs.* Bd. xxvi. Heft 3, pp. 243–248, pl. 16.

This cast of a plastron of a tortoise in sandstone is from Kalksburg, near Vienna; its chief characters are:—dorsal shield strongly arched and steeper in front than behind; form of first three vertebral plates and their mode of connexion with the costals as usual in *Testudo*, but the succeeding ones as in *Emys*; costals alternately wedge-shaped; marginals remarkably high; nuchal and caudal plates very steep. E. B. T.

Hall, Townshend M. Fossil Fish in North Devon. *Geol. Mag.* dec. ii. vol. iii. pp. 410–412.

Notices fish-remains from Devonian and Carboniferous rocks of N. Devon, adding a new species of *Cœlacanthus* nearly allied to *C. granulosus*, Ag., and 2 other species (not named or described), all from Carboniferous rocks at Instow. W. H. D.

Hoernes, Dr. R. *Anthracotherium magnum*, Cuv., aus den Kohlenablagerungen von Trifail. [*Anthracotherium* in Trifail Coal-Measures.] *Jahrb. k.-k. geol. Reichs.* Bd. xxvi. Heft 3, pp. 209–242, pl. 15.

Describes part of the mandible, showing canine and 2 incisors; remarks that probably a lower 3rd incisor was present in the young, but became lost in old age, the formula being thus:—

$$\frac{\text{i. 3, c. 1, pm. 4, m. 3}}{\text{i. 2, c. 1, pm. 4, m. 3}}$$

Detached canines of the upper jaw are also figured. E. B. T.

——. Anthracotherienreste von Zovencedo bei Grancona im Vicentinischen. [*Anthracotherium* from Zovencedo]. *Verh. k.-k. geol. Reichs.* pp. 105–109. Translated in *Boll. R. Com. geol. Ital.* vol. vii. pp. 272–282.

Hornstein, Dr. F. [Triassic Footprints near Cassel.] *N. Jahrb.* Heft ix. pp. 923, 924.

Announces the discovery of footprints in Bunter Sandstone near Karlshafen, resembling those of *Cheirotherium Barthi*; but the toes seem to have been much more slender, and the great toe may have had a claw. If a new species, it is to be named *C. Geinitzi*. F. W. R.

Hulke, J. W. Appendix to "Note on a Modified Form of Dinosaurian Ilium, hitherto reputed Scapula." *Quart. Journ. Geol. Soc.* vol. xxxii. pp. 364–366, woodcut. [See GEOLOGICAL RECORD for 1874, p. 272.]

Fresh material from the Isle of Wight confirms the interpretation of the pelvis of *Iguanodon* given by Prof. Huxley and the author.

Hutton, Capt. F. W. Remarks on Dr. von Haast's Classification of the Moas. *Trans. N. Zealand Inst.* vol. ix. pp. 363–365.

Controverts many of the conclusions of Dr. von Haast, and agrees with Prof. Owen that one genus is enough for the Moa remains.

Huxley, Prof. T. H. Lectures on the Evidence as to the Origin of Existing Vertebrate Animals. [Delivered to working men at the Royal School of Mines.] *Nature*, vol. xiii. pp. 389, 410–412, 429, 430, 467–469, 514–516; vol. xiv. pp. 33, 34.

——. Some Recent Additions to our Knowledge of the Pedigree of the Horse. [Report of Lecture at the London Institution.] *Times* and *Morning Advertiser*, Dec. 4. Reprinted in pamphlet 1877.

Koenen, von, —. [On *Coccosteus Bickensis*.] *Zeitsch. deutsch. geol. Ges.* Bd. xxviii. Heft 3, p. 667.

Note of occurrence of *C. Bickensis* in Goniatite Limestone at Bicken. It differs from *C. decipiens* in the longer and narrower dorsal plate.

Kowalewsky, W. Osteologie des Genus *Entelodon*, Aym. [Osteology of *Entelodon*.] *Palæontographica*, Bd. xxii. Lief. 7, pp. 415–450, pls. 17, 18, 25–27.

Entelodon (Aymard, 1848) was first found in the L. Miocene of Central France; fresh remains have lately been found in the phosphate deposits of Tarn and Garonne. It is here shown to be the earliest two-toed form in the pig family. The parts described are the dentition, part of the cranium, scapula, tibia and fibula, the greater part of both manus and pes. The dental formula is m. $\frac{3}{3}$, p. $\frac{4}{4}$, $\frac{c}{c}$, i. $\frac{3}{3}$. The upper molars have a trapezoid shape; the crowns have 5 cones (of which 3 are anterior), while in the later Suidæ these become reduced to 4; those of the lower jaw have 4. The lower premolars are a series of sharp conical teeth; between the anterior and the next is a diastema. The canines are large, of the same form in both jaws, similar to the usual type, and differing quite from the specialized forms of the later Suidæ. Of incisors only detached ones of the upper jaw were found; but a lower jaw is described with them in position; these have here a peculiar arrangement, increasing in size from the central ones out-

wards. The hinder milk-tooth in the upper jaw, as is usual in Artiodactyles, is like a molar, while the penultimate is triangular, only its hinder part being like that of a molar. The anterior upper premolar had no predecessor, which is normal in the Ungulata. The deciduous teeth of the lower jaw are seen in natural order; the hinder milk-tooth, as universally in Artiodactyles, was a six-lobed tooth, pointing to a common ancestor for the whole group. All the permanent teeth have a collar of wrinkled dull enamel; but this is clear and smooth in the milk-teeth. The functional toes, 3rd and 4th, of the didactyle foot are known. E. B. T.

Lawley, Robert. Nuovi studi sopra i pesci ed altri Vertebrati fossili delle colline toscane. [Tuscan Fossil Vertebrates.] Pp. 122; 5 pls. 4to. *Florence.*

——. Alcune osservazioni sul Genere *Sphærodus*, Agass. [*Sphærodus cinctus*, Ag.] *Atti Soc. Tosc. Sci. Nat.* vol. ii. pp. 60–64, pl. ii.

Leidy, Prof. J. On *Petalodus*. *Proc. Ac. Nat. Sci. Philad.* ser. 3 vol. vi. p. 9.

Verbal communication on a specimen reputed to have come from Cretaceous rocks.

——. *Mastodon andium*. *Proc. Ac. Nat. Sci. Philad.* ser. 3, vol. vi. p. 38.

Verbal description of ramus of lower jaw.

——. Remarks on Fossils from the Ashley Phosphate Beds [S. Carolina]. *Proc. Ac. Nat. Sci. Philad.* ser. 3, vol. vi. pp. 80, 81, 86, 87.

Tooth of *Megatherium*, part of skull of manatee, tusk of walrus (the most southerly locality recorded), *Ceratoptera unios*, n. sp. (Ray), *Myliobates magister*, n. sp., *M. mordax*, n. sp. (Eagle-rays), tooth of *Dinoziphius* (?), and beaks of 5 new species of Ziphioids—*Choneziphius trachops*, *C. liops*, *Eboroziphius cœlops*, *Belemnoziphius prorops*, and *Proroziphius* (n. gen.) *macrops*. *Myliobatis fastigiatus* (n. sp.) and *M. jugosus* (n. sp.) are from Eocene of New Jersey. L. C. M.

——. Fish Remains of the Mesozoic Red Shales [Pennsylvania]. *Proc. Ac. Nat. Sci. Philad.* ser. 3, vol. vi. p. 81.

Three cycloid scales and a few detached caudal rays.

—— Remarks on Vertebrate Fossils from the Phosphate Beds of South Carolina. *Proc. Ac. Nat. Sci. Philad.* ser. 3, vol. vi. pp. 114, 115.

Proroziphius chonops (Ziphioid cetacean, n. sp.) described.

Lydekker, R. Palæontologia Indica. Indian Tertiary and Post-tertiary Vertebrata. Vol. i. 2, ser. x. 2. Molar Teeth and other Remains of Mammalia, pp. 1–69, plates iv.–x. *Mem. Geol. Surv. Ind.*

The first part treats of all the species of fossil *Rhinoceros*; and the second describes the molars of other genera, chiefly Ungulata, but also

comprising *Dinotherium*, *Manis*, and *Amphicyon*. The following 3 species of Falconer are now first fully described:—*Listriodon pentapotamiæ*, *Dinotherium pentapotamiæ*, *Amphicyon palæindicus*, Falc. and Lyd. The new genus *Vishnutherium* is founded; 9 new species are described (see Index of Species), and also several previously known forms. E. T. N.

Lydekker, R. Description of a Cranium of *Stegodon ganesa*, with notes on the subgenus and allied forms. *Rec. Geol. Surv. Ind.* vol. ix. pp. 42–49.

From beds of the middle Siwalik series. While the molars are indistinguishable from those of *Stegodon insignis*, the differences in the skull justify specific distinction. Gives a pedigree of the Proboscidea, in which, *Deinotherium*, *Mastodon*, and *Tapirus* being derived from a common ancestor, *Stegodon* comes direct from *Mastodon*. It is supposed that India was the original home of the family, and that all the subgenera originated in it before Siwalik times. A detailed description of the cranium is given, and a comparison of its measurements with those of a specimen described in the 'Fauna Antiqua Sivalensis.' F. D.

——. Notes on the Osteology of *Merycopotamus dissimilis*. *Rec. Geol. Surv. Ind.* vol. ix. pp. 144–153.

A detailed description of the skeleton, made from various specimens and former notices and figures.

——. Occurrence of Plesiosaurus in India. *Rec. Geol. Surv. Ind.* vol. ix. p. 154.

The first occurrence recorded. The specimen, from the Oolite of Kach, is part of the distal end of the mandible.

Makowsky, Alex. Ueber einen neuen Labyrinthodonten "*Archegosaurus austriacus*." [New Labyrinthodont.] *Sitzb. k. Ak. Wiss. Wien, math.-nat. Cl.* Abth. i. Bd. lxxiii. Heft 3, pp. 155, 166.

In the Rothliegende (Dyas) of Czernahora, Moravia, is a thin shale which contained in the upper third *Walchia piniformis* and ferns, in the middle part fishes, *Palæoniscus*, &c., and in the lower part *Acanthodes gracilis* and a labyrinthodont formerly cited as *Archegosaurus austriacus*, n. sp. The skull is broad, owing to expansion of the quadratojugal beyond the mastoid; nasals scarcely one-third length of frontals; jaws with only one row of teeth, seemingly not lodged in alveoli. Vertebral column embryonic. Ribs at least 24 pairs. 5 lengthened digits in each foot, probably connected by a web. Skin covered with small rhombic scales. Length of largest example 27 centim. Can scarcely be placed under *Archegosaurus*, *Dendrerpeton*, or *Hylonomus*, though it much resembles the latter two. E. B. T.

Malmgren, A. J. Om mammut-fyndens förekomst och utbredning samt om vilkoren för detta djurs forntida existens. [Occurrence and Distribution of Mammoth Remains and Conditions of its Existence.] *Œfv. Finska Vet. Soc. Förh.* xvii. pp. 139–154.

The Finlandian discoveries of mammoth show that the extinction of this animal is nearer historical time than is usually thought.

Marck, Dr. W. v. d. Fossile Fische von Sumatra. [Fossil Fishes from Sumatra.] *Palæontographica*, Bd. xxii. Lief. 7, pp. 405–414, pls. 23, 24.

Protosyngnathus sumatrensis, n. gen. and sp., is characterized by having ossified vertebræ only in the hinder part of the column, no ventral fins, and more rows of dermal plates than in *Pseudosyngnathus*, while there is an anal fin opposite the dorsal. *Sardinioides amblyostoma*, n. gen. and sp., is allied to the herrings; the head is badly preserved, and the scales are not seen. *Brachyspondylus saropterix*, n. gen. and sp., has not the head preserved, but seems akin to the Westphalian Cretaceous genus with narrow vertebræ. *B. indicus*, n. sp., is placed under the same genus. [See **Günther**, p. 257.] E. B. T.

Marsh, Prof. O. C. Principal Characters of the *Dinocerata*. *Amer. Journ.* ser. 3, vol. xi. pp. 163–168, pls. ii.–vi., woodcut. Translated in *Journ. Zool.* t. v. pp. 135–145, plate.

Gives the generic characters of *Dinoceras*. All the species are from the Eocene of Wyoming. *Dinoceras mirabile* and *D. laticeps* are figured.

——. Principal Characters of the *Tillodontia*. *Amer. Journ.* ser. 3, vol. xi. pp. 249–251, pls. viii., ix., woodcut. Translated in *Journ. Zool.* t. v. pp. 244–248, plate.

Gives the generic characters of *Tillotherium*. *T. fodiens*, from the Eocene of Wyoming, is figured.

——. Principal Characters of the *Brontotheridæ*. *Amer. Journ.* ser. 3, vol. xi. pp. 335–340, pls. x.–xiii.; 2 woodcuts. Translated in *Journ. Zool.* t. v. pp. 248–255, plate.

Gives generic characters of *Brontotherium* (=*Symborodon* Cope, in part, and *Miobasileus* Cope), *Menodus* (=*Titanotherium* Leidy), *Megacerops* Leidy (=*Megaceratops* Cope, and *Symborodon* Cope, in part), and *Diconodon* (=*Anisacodon*). The species figured are *Brontotherium ingens* and *B. gigas*. G. A. L.

——. On some Characters of the genus *Coryphodon*, Owen. *Amer. Journ.* ser. 3, vol. xi. pp. 425–428; figures in text.

Coryphodon hamatus, n. sp., from base of Eocene, Wyoming.

——. Notice of a new Suborder of Pterosauria. *Amer. Journ.* ser. 3, vol. xi. pp. 507–509; *Nature*, vol. xiv. p. 181.

Pteranodontia, with teeth in both jaws. *Pteranodon comptus*, n. gen. and sp., the smallest American Pterodactyle known, is described, from the U. Cretaceous of W. Kansas. G. A. L.

——. Notice of new Odontornithes. *Amer. Journ.* ser. 3, vol. xi. pp. 509–511. Translated in *Journ. Zool.* t. v. pp. 304–306.

Lestornis (n. gen.) *crassipes*, *Hesperornis gracilis*, and *Ichthyornis victor*, new species from U. Cretaceous of W. Kansas, are described.

——. Recent Discoveries of Extinct Animals. *Amer. Journ.* ser. 3, vol. xii. pp. 59–61; and *Amer. Nat.* vol. x. pp. 436–438.

A lecture on late researches in the Rocky Mts. An account of the

discoveries of the Odontornithes *Pteranodontia, Dinocerata, Tillodontia, Brontotheridæ*, &c. A summary of theoretical conclusions as to the development of the Tertiary Mammalia. H. A. N.

Marsh, Prof. O. C. On the Odontornithes, or Birds with Teeth. *Geol. Mag.* dec. ii. vol. iii. pp. 49–53, pl. 2. Reprint from *Amer. Journ.* vol. x. pp. 1–7, pls. ix., x. See GEOLOGICAL RECORD for 1875, p. 286.

Mivart, Prof. St. G. What are Bats? *Pop. Sci. Rev.* vol. xv. pp. 225–240.

Notes on geographical and geological distribution and evolution.

Nehring, Dr. A. Beiträge zur Kenntniss der Diluvialfauna. [Contributions to the Knowledge of the Diluvial Fauna (continuation).] *Zeitsch. gesammt. Nat.* (n. F.) Bd. xiii. pp. 1–68, 177–236, pls. i., ii.

Mentions localities from which diluvial fossils have been obtained, giving lists from each. The fossils mentioned are chiefly vertebrate, and include some human bones. *Alactaja jaculus*, Pallas, is now for the first time fully described as a fossil. *Spermophilus superciliosus*, Kaup, is also described. W. H. D. & E. T. N.

Newberry, Prof. J. S. Descriptions of the Carboniferous and Triassic Fossils collected on the San Juan Exploring Expedition under Capt. J. N. Macomb, U.S. Engineers. *Report of the Exploring Expedition in* 1859, *under the command of Capt. J. N. Macomb*, pp. 137–148, pls. iii.–viii. *Washington.*

Some Cretaceous fishes are recognized from their teeth; and *Deltodus Mercurei* is described as a new species from the Coal Measures of Santa Fé, New Mexico. For INVERTEBRATA and PLANTS see *post.* H. A. N.

Newton, E. T. On two Chimæroid Jaws from the Lower Greensand of New Zealand. *Quart. Journ. Geol. Soc.* vol. xxxii. pp. 326–331, pl. xxi.

A mandible identical with *Ischyodus brevirostris* from the Gault of Folkestone, and *Callorhynchus Hectori*, n. sp., closely allied to *C. antarcticus*, are described from a fine conglomerate (L. Greensand?) at Amuri Bluff. L. C. M.

Oldham, Dr. On a Salamandriform Labyrinthodon (*Keraterpeton*, ? sp.) from the Coal Measures near Castlecomer, Ireland. *Rep. Rugby School Nat. Hist. Soc.* for 1875, pp. 74–76, pl. 7.

Describes a specimen with skull, vertebral column, and a few ribs. Length 5¼ inches. See **Wilson,** GEOLOGICAL RECORD for 1875, p. 296.

Oustalet, E. Les Vertébrés Crétacés du Kansas. [Cretaceous Vertebrata of Kansas.] *Rev. Sci.* t. xi. pp. 303–308.

An account of palæontological researches by Profs. Cope and Leidy in Cretaceous beds of the West.

Owen, Prof. R. Descriptive and Illustrated Catalogue of the Fossil Reptilia of South Africa in the Collection of the British Museum. Pp. xii, 88; 70 pls. 4to. *London.*

The history of the discovery is related in the Introduction. All the

fossils are from the Beaufort and Stormberg beds, so far as the localities are known. In the Catalogue they are provisionally referred to the Trias. The evidence of Labyrinthodont and Dinosaurian remains, besides that of fossil plants, is "held to show the geological correspondency of the Panchét and Kamthi groups in India with the Beaufort beds in South Africa." The S. African Reptilia are elsewhere (p. ix) said to be not later than the Trias, and probably Palæozoic.

Express definitions of the new orders, families, genera, and species are not given. The following are new:—REPTILIA. Order Dinosauria. Family *Tretospondylia*: *Tapinocephalus Atherstonii*, pp. 1–6, pls. i.–v. Fam. *Serratidentia*: *Pareiasaurus serridens*, pp. 6–8, 71, pls. vi.–viii.; *P. bombidens*, pp. 9–13, pls. viii.–xii. liv.; *Anthodon serrarius*, pp. 14, 15, 71, pls. xiii., lxx.—Order Theriodontia. Fam. *Binarialia*: *Lycosaurus pardalis*, pp. 15, 16, pl. xiv.; *L. tigrinus*, p. 17, pl. xv.; *L. curvimola*, pp. 71–73, pl. lxviii.; *Tigrisuchus simus*, p. 17, pl. xvi. Fam. *Mononarialia*: *Cynodraco serridens*, p. 18, pl. xvii.; *C. major*, pp. 19, 20, pls. ii., xix.; *Cynosuchus suppostus*, pp. 21, 22, pl. xvi.; *Nythosaurus larvatus*, p. 24, pls. xx., xxxiv.; *Scaloposaurus constrictus*, pp. 24, 25, pl. xvi.; *Procolophodon trigoniceps*, pp. 25, 26, pl. xx.; *P. minor*, p. 26, pl. xx. Fam. *Tectinarialia*: *Gorgonops torvus*, pp. 27, 28, pls. xxi., xxii.; *G.* sp. ?, pp. 28, 29.—Order Anomodontia. Fam. *Bidentalia*: *Dicynodon lacerticeps*, pp. 30, 31, pl. xxiii.; *D. leoniceps*, pp. 32–36, 47, 48, pls. xxiv.–xxviii., lxx.; *D.? parvidens*, p. 82, pl. xxviii.; *D. pardiceps*, pp. 42, 43, pls. xxxviii., xxxix., xli., xlii., liii.; *D. rectidens*, p. 44, pls. xxxv., xl.; *D. curvatus*, pp. 44, 45; *D. feliceps*, p. 45, pl. xliii.; *D. recurvidens*, p. 46, pl. lxix.; *D. dubius*, pp. 46, 47, pl. lxix.; *Ptychognathus latirostris*, pp. 49, 50, pls. xlvi.–xlviii.; *P. boopis*, p. 50, pls. xlviii. xlix.; *P. verticalis*, pp. 50, 51, pl. xlix.; *P. depressus*, p. 53, pl. li.; *P. pusillus*, p. 85, pl. liii. Fam. *Cryptodontia*: *Oudenodon brevirostris*, pp. 57, 58, pls. lviii., lix.; *O. Bainii*, pp. 58, 59, pls. lvi., lx.; *O. prognathus*, p. 59, pl. lxi.; *O. Greyi*, pp. 59, 61, pls. lxii., lxv. (the previously described *Dicynodon strigiceps* is referred to *Oudenodon*); *Dicynodon raniceps*, p. 61; *D. megalops*, p. 62, pl. lxiii.; *Theriognathus microps*, p. 62, pl. lxiii.; *Kistecephalus microrhinus*, p. 63, pls. lxiv., lxix.; *K. leptorhinus*, p. 64, pl. lxiv.; *K. chelydroides*, p. 64, pl. lxiv.; *K. planiceps*, p. 64, pl. lxiv.; *K. arctatus*, p. 65, pl. lxv.; *K. bathygnathus*, p. 65, pl. lxv. Fam. *Endothiodontia*: *Endothion bathystoma*, p. 66, pls. lxvi., lxvii. Fragments of *Anomodontia*, pp. 73, 74.—Subclass DIPNOA. Order Labyrinthodontia. Section *Æquidenticulata*. Fam. *Coccoganoidea*: *Petrophryne granulata*, p. 67, pl. xx.; *P. major*, pp. 68, 69; *Saurosternon Griesbachii*, p. 88, pl. lxx. Many previously known species are redescribed and figured.

A summary discusses the lost reptilian characters manifested in extinct species. L. C. M.

Owen, Prof. R. On a new Modification of Dinosaurian Vertebræ. *Quart. Journ. Geol. Soc.* vol. xxxii. pp. 43–46, pls. iv., v.

Vertebræ of *Tapinocephalus* and *Pareiosaurus*, Triassic (?) Dinosauria

from S. Africa, are described as "Tretospondylian," having the middle of the centrum deeply excavated on each side by a contracted conical pit. L. C. M.

Owen, Prof. R. Evidence of a carnivorous Reptile (*Cynodraco major*, Ow.) about the size of a Lion, with Remarks thereon. *Quart. Journ. Geol. Soc.* vol. xxxii. pp. 95–102, pl. xi.

A block from the Karoo beds contained two upper canines, like those of *Machairodus*, compressed, serrate behind, projecting beyond the lower jaw, which remained in place. The lower canines in front of the upper, the crowns broken off; a diastema separated them from the close-set elliptical incisors ($\frac{-}{4-4}$), of which also only the bases remained. In another block was found a humerus with an "entepicondylar" foramen (above the ulnar condyle). These fragments are associated together and named *Cynodraco*, and included with other genera in the new order Theriodontia. The absence of the essential characters of these Dinosaurs in existing reptiles and their reappearance in certain mammals are remarked. L. C. M.

——. Evidences of Theriodonts in Permian Deposits elsewhere than in South Africa. *Quart. Journ. Geol. Soc.* vol. xxxii. pp. 352–363; 9 woodcuts.

Brithopus priscus, Kut., and *Orthopus primævus*, Kut., from the Permian of Perm, are founded upon the upper and lower extremities of a reptilian humerus, probably of one species. They agree in the "entepicondylar" perforation with the Theriodonts of the Karoo beds, and also in the great development of the "ectocondylar" crest. A humerus attributed by Waldheim to *Eurosaurus*, another assigned to *Rhopalodon*, and *Deuterosaurus biarmicus*, are other Permian fossils of the Ural now identified as Theriodonts. *Bathygnathus* (Prince Edward I.), the thecodont saurians of the Dolomitic Conglomerate of Bristol, and *Cladiodon* from the New Red of Warwickshire are placed in the same order. Eichwald wrongly identified *Brithopus*, *Orthopus*, and *Melosaurus* with *Eurosaurus*. L. C. M.

——. On the Fossil Mammals of Australia. Part. x.—Family Macropodidæ: Mandibular Dentition and Parts of the Skeleton of *Palorchestes*; additional evidences of *Macropus*, *Titan*, *Sthenurus*, and *Procoptodon*. *Phil. Trans.* vol. clxvi. pt. i. pp. 197–226.

Describes the mandibular characters of *Palorchestes Azael*, the os innominatum and other bones of *Palorchestes*, the skull and other bones of *Macropus Titan*, restoration of the teeth and part of the skull of *Sthenurus Atlas*, restoration of dentition and part of the skull of *S. Brehus*, the metatarsus of *Macropus affinis*, the same of *Phascolagus altus*, the metatarsal and femoral characters of *Procoptodon*. R. E., Jun.

——. On *Petrophryne granulata*, Ow., a Labyrinthodont Reptile from the Trias of South Africa, with special comparison of the skull with that of *Rhinosaurus Jasikovii*, Fisch. *Bull. Soc. Imp.*

Nat. Mosc. t. li. pp. 147–153; woodcuts. See also *Journ. Zool.* t. v. pp. 280–294.

Describes this new species. [See above, *Fossil Reptilia of South Africa.*]

Owen, Prof. R. On the existence or not of Horns in the Dinocerata. *Amer. Journ.* ser. 3, vol. xi. pp. 401–403.

Points out that as there is no evidence to show that the Dinocerata were horned, the name itself is misleading.

Plant, John. Evidence to prove that a Bone from the Windy Knoll, Castleton, named by Prof. W. Boyd Dawkins, F.R.S., "Sacrum of Young Bison," is a Sacral Bone of the Cave Bear, *Ursus spelæus*. *Proc. Manch. Lit. Phil. Soc.* vol. xv. pp. 107–112.

Probst. [Sharks of U. Swabian "Meeresmolasse."] *Jahresh. Ver. Nat. Württ.* Jahrg. 32, pp. 51–55.

Rolleston, Prof. G. On the Prehistoric British *Sus*. *Journ. Linn. Soc.* vol. xiii. no. 66, pp. 108, 109.

Compares a skull, amongst others, of a wild sow, from alluvium near Oxford of later date than "river gravel," with *Sus scrofa* and varieties, and *S. cristatus*. R. E., Jun.

Sanders, W. On certain large Bones in Rhætic Beds at Aust Cliff, near Bristol. *Rep. Brit. Assoc.* for 1875, *Sections*, pp. 80, 81.

The bones, now in the British Museum, were supposed by Mr. Stutchbury to belong to a *Labyrinthodont*. They more nearly resemble those of *Megalosaurus*. W. T.

Sauvage, Dr. H. E. Note sur le genre *Nummopalatus* et sur les espèces de ce genre trouvées dans les terrains tertiaires de la France. [The Genus *Nummopalatus* and the Species found in French Tertiaries.] *Bull. Soc. Géol. France*, ser. 3, t. iii. pp. 613–630, pls. xxii., xxiii.

Four genera, *Taurinichthys*, *Pharyngodopilus*, *Phyllodus*, and *Egertonia*, have been included by Cocchi in the family Pharyngodopilidæ. The name *Nummopalatus* is to take the place of the genus which has given its name to the family, as it has priority. 13 species are described, of which 8 are new (see Index of Species). E. T. N.

——. Notes sur les Poissons fossiles. [Fossil Fishes.] *Bull. Soc. Géol. France*, ser. 3, t. iii. pp. 631–643, pls. xxii.–xxiv.

1. On a new species of *Taurinichthys* from the Faluns of Brittany, for which the name of *T. Sacheri* is proposed (see above). 2. On *Sargus Sioni*, Rouault. 3. On the Squalidæ of the Faluns of Brittany. Three species of *Oxyrhina* are described, and a new *Odontaspis*, *O. Sacheri*. 4. On the *Cottus* (*Lepidocottus*, n. gen.) *aries* of Aix-en-Provence. 5. On a Percoid fish from the Marls of Aix-en-Provence, *Paraperca provincialis* (n. gen. and sp.). 6. On a fish from U. Tertiary marls of Lorca (Spain), *Trachinopsis Iberica*, n. gen. and sp. E. T. N.

Sauvage, Dr. H. E. Note sur les débris d'Ichthyosaure des couches rhétiennes de Saône et Loire. [Rhætic Ichthyosauri, &c.] *Ann. Sci. Géol.* t. vii. one page.

On vertebræ from Antilly and Le Condre (Saône et Loire) two n. sp. are founded :—*Ichthyosaurus rheticus* : dorsal vertebræ biconcave, transverse and perpendicular diameters equal, longitudinal $=\frac{2}{5}$ perpendicular diameter, lower surface flat, diapophysis and parapophysis touch. *I. carinatus* : vertebræ compressed, antero-posterior diameter being $\frac{2}{7}$ of the transverse. E. B. T.

——. Essai sur la Faune Ichthyologique de la période liasique, suivi d'une notice sur les Poissons du Lias de Vassy. 2nd part. [Liassic Fish of Vassy.] *Ann. Sci. Géol.* t. vii. cah. 1, pp. 24; 5 plates.

From the bituminous limestone of the U. Lias at Vassy the following are described as new species—*Ptycholepis Barrati*, *Caturus stenospondylus*, *C. Cotteaui*, *C. stenoura*, *Pachycormus elongatus*. [Continuation: see Geological Record for 1875, p. 291.] E. B. T.

Seeley, H. G. On the posterior portion of a Lower Jaw of *Labyrinthodon* (*L. Lavisi*) from the Trias of Sidmouth. *Quart. Journ. Geol. Soc.* vol. xxxii. pp. 278–284, pl. xix.

In addition to the constituents of the mandible of *Labyrinthodon* previously known, splenial and surangular and, not improbably, coronoid bones occur. *L. Lavisi* (n. sp.) is distinguished by "the depth and outline of the postarticular part of the jaw and the differences of sculpture in the lateral subarticular ornament." L. C. M.

——. Notice of the Occurrence of Remains of a British Fossil *Zeuglodon* (*Z. Wanklyni*, Seeley) in the Barton Clay of the Hampshire Coast. *Quart. Journ. Geol. Soc.* vol. xxxii. pp. 429–432.

"Differs from all known species of *Zeuglodon* in the shortness of the interspaces between the teeth, and apparently in the characters of the premolar teeth, as well as in the shorter form of the skull." L. C. M.

——. On an associated Series of Cervical and Dorsal Vertebræ of *Polyptychodon* from the Cambridge Upper Greensand, in the Woodwardian Museum, &c. *Quart. Journ. Geol. Soc.* vol. xxxii. pp. 433–436.

——. On *Crocodilus Icenicus* (Seeley), a second and larger Species of Crocodile from the Cambridge Upper Greensand, contained in the Woodwardian Museum, &c. *Quart. Journ. Geol. Soc.* vol. xxxii. pp. 437–439.

N. sp. founded on one cervical and one dorsal vertebra.

——. On *Macrurosaurus semnus* (Seeley), a Long-tailed Animal with Procœlous Vertebræ from the Cambridge Upper Greensand, preserved in the Woodwardian Museum, &c. *Quart. Journ. Geol. Soc.* vol. xxxii. pp. 440–444; 2 woodcuts.

N. sp. founded on 25 successive caudal vertebræ.

Seeley, H. G. On remains of *Emys Hordwellensis* (Seeley), from the Lower Hordwell Beds in the Hordwell Cliff, contained in the Woodwardian Museum, &c. *Quart. Journ. Geol. Soc.* vol. xxxii. pp. 445–450; 2 woodcuts.

N. sp. founded on carapace and plastron.

——. On the British Fossil Cretaceous Birds. *Quart. Journ. Geol. Soc.* vol. xxxii. pp. 496–512, pls. xxvi., xxvii.

Two species allied to *Colymbus* from the Cambridge Greensand. "The larger, here named *Enaliornis Barretti*, is indicated by skull, vertebral column, pelvis, and all the larger bones of the hind limb; the smaller species, *Enaliornis Sedgwicki*, is at present only known by its dorsal vertebræ, femur, tibia, and metatarsus." L. C. M.

——. On the Organization of the Ornithosauria. *Journ. Linn. Soc.* vol. xiii. pp. 84–107, pl. 11.

Places the Ornithosauria amongst Aves.

Symonds, Rev. W. S. The Fossil [Human] Skeletons of Le Puy en Velay. *Nature*, vol. xiii. p. 207.

Traquair, Dr. R. H. On New and Little-known Fossil Fishes from the Edinburgh District.—No. I. *Proc. R. Soc. Edin.* vol. ix. pp. 262–272.

The following are described—*Nematoptychius gracilis*, n. sp., *Gonatodus* (*Amblypterus*) *punctatus*, Ag., and *Gonatodus macrolepis*, n. sp. All from Coal Measures. The new genus *Gonatodus* is founded for the reception of some palæoniscoid fishes. H. A. N.

Wallace, A. R. The Geographical Distribution of Animals, with a Study of the Relations of Living and Extinct Faunas as elucidating the past Changes of the Earth's Surface. Vol. i. Pp. xxiv. 503, 5 maps, 13 plates. 8vo. *London.* (Vol. ii. not geological.)

Chap. ii. Distribution as affected by the Conditions and Changes of the Earth's Surface. Chaps. vi., vii. Extinct Mammalia of the Old World. Chap. viii. Various Extinct Animals, and on the Antiquity of the Genera of Insects and Land Mollusca. W. H. D.

Winkler, Dr. T. C. Mémoire sur quelques restes de Poissons du système heersien. [Fishes from Heersian beds, &c.] *Arch. Mus. Teyler*, t. iv. fasc. 1, pp. 1–15, pl. 1.

Note on scattered remains of scales, teeth, &c. The new species are *Osmeroïdes belgicus*, *Cycloïdes* (n. gen.) *incisus*, founded on scales, *Otodus Rutoti*, *O. parvus*, *O. striatus*, *Galeocerdo maretsensis*, *Notidanus orpiensis*, *Trigonodus* (n. gen.) *primus* (seems a *Sphenonchus*), all from Belgium. E. B. T.

——. Deuxième mémoire sur les dents de Poissons fossiles du terrain bruxellien. [Bruxellian Fishes.] *Arch. Mus. Teyler*, t. iv. fasc. 1, pp. 16–48, pl. 2.

In this second memoir on fishes from the Bruxellian beds of Belgium 10 new species are described (for the names of which see Index of Species), and the new genus *Trichiurides* is founded. E. B. T.

Winkler, Dr. T. C. Étude sur le genre *Mystriosaurus* et description de deux exemplaires nouveaux de ce genre. [*Mystriosaurus*—two new examples.] *Arch. Mus. Teyler*, t. iv. fasc. 1, pp. 49–132, 3 pls., 2 woodcuts.

Contains an historical review of the genus *Mystriosaurus* (=*Teleosaurus*), enumeration and comparison of spurious species, &c.; concludes that all the Lias Teleosauri of England and Germany belong to one species, of which there are two chief varieties—*M. bollensis* and *M. Chapmani*. Proposes to unite these under the name of *M. Stukeleyi*, in honour of the first discoverer of the Whitby crocodile. E. B. T.

Wright, B. M. [Fossil Turtle, *Chelonia Hoffmanni*.] *Nature*, vol. xiv. p. 17.

From Upper Chalk of Maestricht, 4 feet 1 inch in length, and 22 inches wide. C. E. D.

Zigno, Baron A. de. Annotazione Paleontologiche sopra i Reste di uno Squalodonte scoperti nell Arenaria Miocena del Bellunese. [Miocene Squalodont from the Bellunese.] *Mem. R. Ist. Ven. Sci.* vol. xx. pp. 17, plate. Also *Verh. k.-k. geol. Reichs.*; *Boll. R. Com. geol. Ital.* vol. vii. pp. 443–446; *Journ. Zool.* t. v. pp. 445, 446; and *Bull. Ac. R. Belg.* sér. 2, t. xli. pp. 958–960.

Allied to *Pachyodon Catulli*, Molin. Will be noticed by Gervais in 'Ostéographie des Cétacés.'

See also :—

Fliche, P. Fauna of Peat Mosses of Champagne : p. 276.

Geinitz, Prof. H. B. Rhætic Fish, S. America: *post*, under Plants.

M'Coy, Prof. F. *Thylacoleo* and *Diprotodon*, Victoria: pp. 283, 284.

Roemer, Ferd. Lethæa Geognostica: *post*, Invertebrata.

2. *INVERTEBRATA.*

Achiardi, Prof. Antonio d'. Coralli Eocenici del Friuli. [Eocene Corals of Friuli.] Part iii. *Atti Soc. Tosc. Sci. Nat.* vol. i. fasc. 3, pp. 147–222, pls. viii.–xix. [see GEOLOGICAL RECORD for 1875, p. 297, and *post*, Supplement for 1875].

Describes and figures 32 new species (see Index of Species) and others.

Ancona, — de. Sulle Neritine fossili. [Fossil Neritinæ.] *Boll. Soc. Mal. Ital.* vol. ii.

Arnaud, H. Étude sur le genre *Cyphosoma* dans le Craie du Sud-ouest. [*Cyphosoma* of Chalk, S.W. France.] *Act. Soc. Linn. Bordeaux*, ser. 4, t. i. pp. 70–78, folding table.

Describes *Cyphosoma minus*, *C. Cotteaui*, *C. propinquum*, *C. Engolismense*, and *C. inflatum;* all new.

Barrett, Dr. S. T. Description of a new Trilobite, *Dalmanites dentata*. *Amer. Journ.* ser. 3, vol. xi. p. 200, plate vii. (photograph). See also vol. xii. pp. 70, 71 (additional note).

From the upper compact beds of the *Delthyris* shale (L. Helderberg), near Port Jervis, Orange Co., N. York.

Barrois, Charles. Note sur les foraminifères arénacés. [Arenaceous Foraminifera.] *Ann. Soc. Géol. Nord*, t. iii. pp. 18–20.

Notes of a general nature.

Bellardi. Descrizione di un Nuovo Genere della Famiglia delle Bullide, Fossile del Terreno Pliocenico Inferiore del Piemonte e della Liguria. [New Genus of Bullidæ from L. Pliocene of Piedmont and Liguria.] *Bull. Soc. Mal. Ital.* vol. ii.

Benecke, [Dr.] E. W. Ueber einige Versteinerungen, insbesondere aus den Umgebungen von Esino. [Fossils from near Esino.] *Benecke's Geogn.-pal.-Beiträge*, Bd. ii. Heft 3, pp. 296–317, plates 22–24.

Esinospongia is shown to be merely a mineral concretion, of fibrous or radiate structure, but without organization. Under *Gyroporella* is stated the distinction between two groups of forms, *Gyroporella* [*Diplopora*] *annulata*, characterizing the L. Keuper dolomites, while *G. vesiculifera* occurs above the Raibl beds. The only new species described is *Ammonites Manzonii* from Val de Cino, Esino beds. E. B. T.

Billings, E. On the Structure of *Obolella chromatica*. *Amer. Journ.* ser. 3, vol. xi. pp. 176–178; 2 woodcuts.

Describes the internal characters of *O. chromatica*, as elucidating the

characters of the genus. The species regarded as belonging to *Obolella* are *O. chromatica*, *O. polita*, *O. crassa*, *O. nana*, and *O. gemma*, all confined to the Potsdam period. H. A. N.

Blake, Rev. J. F. Lower Silurian Foraminifera. *Geol. Mag.* dec. ii. vol. iii. pp. 134, 135.

Notices the occurrence of well-preserved casts of Foraminifera in laminated Caradoc shales near Aberystwith, the most perfect of which could not be distinguished from those of *Dentalina communis*. H. A. N.

——. On *Renulina Sorbyana*. *Micr. Journ.* vol. xv. pp. 262–264, woodcuts.

Certain minute kidney-shaped bodies, noticed by Mr. Sorby in the Calcareous Grit of Scarborough, have now been found in abundance in beds of about the same age at Sturminster Newton, Dorsetshire. The author regards them as Foraminifera, and names them as above. E. T. N.

Bornemann, Dr. L. G., Jr. [*Aptychus.*] *N. Jahrb.* Heft vi. pp. 646, 647.

On microscopic studies of Liassic and Jurassic *Aptychi* from Italy.

Brady, H. B. A Monograph of Carboniferous and Permian Foraminifera (the Genus *Fusulina* excepted). Pp. 116, plates i.–xii. *Pal. Soc.*

After a short introduction, considers the structure and mode of origin of the Mountain Limestone of Britain, which is not composed of Foraminifera to any great extent or as a general rule. The next section (pp. 8–18) deals with classification, and with various zoological considerations. The principal conclusions are :—(1) The prevalent Carboniferous and Permian Foraminifera (except *Fusulina*) do not belong, in a strict sense, to either of the two suborders Perforata and Imperforata, but rather to intermediate types, neither invariably arenaceous nor uniformly perforate in their shell-texture. (2) In the modifications of these primitive intermediate types some varieties occur which are conspicuously sandy and imperforate, others that are essentially hyaline and porous; and there are indications that their varietal peculiarities have been transmitted as permanent characters, thereby originating the two parallel isomorphic series. (3) From negative evidence, the porcellanous imperforate group (Miliolida) is of later creation. (4) The Permian rhizopod-fauna is very limited as compared with the Carboniferous, being confined to 5 genera—*Trochammina*, *Nodosinella*, *Nodosaria*, *Textularia*, and *Fusulina*, representing, however, at least 4 families. An outline of the history of the subject is given, followed by a chronological list of the materials upon which the nomenclature of the monograph is based. Pp. 27–51 are devoted to a consideration of localities. A bibliography is given; and the body of the work (pp. 56–151) is occupied with the description of the genera and species. 59 species (some not yet detected in Britain) are

described in all, belonging to 20 genera. Of these, 8 species are only known as Permian, 4 are both Permian and Carboniferous, and the remainder are exclusively Carboniferous. 24 new species are described (see Index of Species), only one of which goes up to Permian. H. A. N.

Brady, H. B. Notes on a Group of Russian *Fusulinæ*. *Annals*, ser. iv. vol. xviii. pp. 414–422, pl. xviii.

Describes and figures specimens from the Carboniferous Limestone of Miatschkow. The species have been referred to *Fusulina*, *Nummulina*, *Borelis*, *Alveolina*, and *Orobias*; but they are all genuine *Fusulinæ*, and all members of a series "in which it may not be difficult eventually to trace every gradational link from the elongate fusiform contour of the type (*F. cylindrica*) to a compound lenticular form having the general aspect of a Nummulite." Discusses the affinities of the genus, and decides that it cannot be associated with the Rotalines, but "finds its most appropriate place in the family Nummulinidæ, though amongst the least highly organized members of the group."

H. A. N.

Brauns, Dr. D. Ueber einige neue Petrefactenfünde vom Hamberge bei Göttingen. [New (M. Lias) Fossil-deposit near Göttingen.] *Zeitsch. gesam. Nat.* n. F. Bd. xii. pp. 449–453.

——. *N. Jahrb.* Heft vii. pp. 647, 648.

Defence of species to which Struckmann had taken exception.

Brögger, W. C. "Andrarumskalk" ved Breidengen i Valders. [Andrarum-limestone at Breidengen in Valders, Norway.] *Geol. Fören. Stockholm Förh.* Bd. iii. pp. 193–198, plate.

Description of fossils. The following are figured:—*Agnostus lævigatus*, Dalm.; *Agnostus bituberculatus*, Ang.; *Paradoxides Forchhammeri*, Ang.; *Liostracus microphthalmus*, Ang.; *Selenopleura brachymetopa*, Ang.; *Hyolithus tenuistriatus*, Linrs.; *Acroteta*, (?) n. sp. Section figured in text. E. E.

Brongniart, Ch. Observations sur un Insecte fossile de la Famille des Diptères trouvé à Chadrat (Auvergne). [Fossil Dipterous Insect, &c.] *Ann. Sci. Géol.* t. vii. cah. 1, pp. 2. See also *Bull. Soc. Géol. France*, sér. 3, t. iv. pp. 459, 460, pl. xiii. figs. 5–8. [Different title.]

From the L. Miocene of Auvergne is here described *Protomyia Oustaleti*, n. sp. The genus only occurs fossil; the species has a small head and oval thorax, the abdomen thick, and the wings scarcely exceeding it in length. E. B. T.

——. Note sur un nouveau genre d'Entomostracés fossiles, provenant du terrain carbonifère de Saint-Etienne (*Palæocypris Edwardsii*). [New Carboniferous Entomostracan from St. Etienne.] *Compt. Rend.* t. lxxxii. pp. 518–520.

N. gen. and sp. A small Ostracode found in the siliceous filling of a *Cardiocarpon*, and preserving the antennæ, feet, eye, and jaws.

Brugnone. Due Specie Fossili Nuove di Altavilla. [2 New Fossils from Altavilla.] *Bull. Soc. Mal. Ital.* vol. ii.

Brusina, Spiridion. Description d'espèces nouvelles provenant des terrains tertiaires de Dalmatia. [New Species from Dalmatian Tertiary.] *Journ. Conchyl.* ser. 3, t. xvi. pp. 109–116.

Describes *Melanopsis camptogramma*, *M. astrapœa*, *Prososthenia decipiens*, *Fossarulus moniliferus*, *F. armillatus*, and *Neritina Sinjana*. Raises the varieties *Melanopsis cylindracea*, *M. nodulosa*, *M. plicatula*, *Pyrgula exilis*, and *Prososthenia apleura* to the rank of species.

C. P. G.

Carpenter, Dr. W. B. New Laurentian Fossil. *Nature*, vol. xv. pp. 8, 9, 68.

Records the discovery of specimens, supposed to be organic, in a limestone amongst the metamorphic rocks of Tarbert, Harris. In the later communication, the author states the supposed fossil to be purely inorganic. C. E. D.

——. Notes on Otto Hahn's "Microgeological Investigation of *Eozoön Canadense*." *Annals*, ser. 4, vol. xvii. pp. 417–422.

A controversial paper, meeting the objections of Hahn (see p. 278) against the organic nature of *Eozoön*.

Carter, H. J. *Parkeria* inferred to have been a Species of *Hydractinia*. *Annals*, ser. 4, vol. xviii. p. 187.

Examination of specimens has led the author to believe that this genus is to be referred to the Hydractinidæ.

Coppi, Fr. Monografia ed iconografia della Terramara di Gorzano. Vol. iii. [Monograph of the Terramara of Gorzano.] Pp. 34; 16 pls. 4to. *Modena*.

——. Frammenti di Paleontologia Modenese. [Modena Fossils.] *Boll. R. Com. geol. Ital.* t. vii. pp. 190–209.

Descriptions of fossils from his collection which the author considers undescribed; many have names taken from Doderlein's catalogue (these are described as new thus, "Doderlein—mihi"); varietal names are omitted in this abstract. *Murex larvatus* (Dod.), U. Mioc. *Nassa angyostoma* (Dod.), L. Plio. *N. labelloides*, n. sp., U. Mioc. *N. Zibinica*, n. sp., U. Mioc. *Terebra Scarabelli* (Dod.), U. Mioc. *T. Bellardiana*, n. sp., U. Mioc. *Pyrula Hörnesiana* (=*P. reticulata*, Hörnes, non Lamk.), U. Mioc. *Mitra tiberiana*, n. sp., U. Mioc. *Marginella cuneata* (Dod.) and *M. obovata* (Dod.), U. Mioc. *Conus gastriculus* (Dod.), U. Mioc. *Pleurotoma-Drillia Grassi* (Dod.), Plioc. *P.-D. Tiberiana*, n. sp., U. Mioc. *P.-D. Tiberi-Bellardiana*, n. sp., U. Mioc. *Clavatula Brignoli* (Dod.), U. Mioc. *Clavatula-Perrona monocincta* (Dod.), U. Mioc. *Raphitoma-Clathurella Iosephinica*, n. sp., L. Plioc. *Raphitoma Sylvana*, n. sp., Plioc. *Odontostoma proximum*, n. sp., Plioc. *Odontostoma minimum*, n. sp., Plioc. *Turbonilla D'Anconiana*, n. sp., U. Mioc. *Cerithium variolatum* (Dod.), U. Mioc. *Valvata mutinensis*?, n. sp.,

Pleist. *Rissoa Tiberiana*, n. sp., L. Plioc. *R. Manzoniana*, n. sp., Plioc. *Helcion tectula*?, n. sp., U. Mio., Plio. *Dentalium intermedium*, n. sp., U. Mio., Plioc. *Limnæus Stoppanianus*, n. sp., Plioc. *Atys-Sao*? *Ieffreyanus*, n. sp., U. Mioc. *Ostrea lithodoma* (Dod.), L. Plioc. *Pecten-Neithea*? *Zibinica*, n. sp., U. Mioc. *Arca mutinensis*, U. Mioc. *Petricola cycladiformis* (Dod.), L. Mioc. *Lingulina mutinensis*, n. sp., U. Mioc. *Robulina glauca*, n. sp., U. Mioc., Plio. E. B. T.

Cotteau, G., A. Peron, and V. Gauthier. Échinides Fossiles de l'Algérie. Description des espèces déjà recueillies dans ce pays et considérations sur leur position stratigraphique. [Fossil Echinoderms from Algiers, with Remarks upon their Stratigraphical Position.] Part 1, pp. 30, 2 plates and woodcut. Part 2 noticed in Geological Record for 1875, p. 301. Part 3, pp. 90, 8 plates, 4 woodcuts. 8vo. *Paris.*

Part 1. Sequanian. Introductory remarks by **Peron** on the geology, followed by descriptions of 25 species belonging to 11 genera.

Part 3, chap. I. Urgo-Aptian. A stratigraphical account, and description of 20 species belonging to 14 genera. Chap. II. Albian. Remarks upon the occurrence of rocks of this age, with descriptions of 17 new species belonging to 11 genera (see Index of Species). E. T. N.

Dames, —. [On a *Dictyonema*.] *Zeitsch. deutsch. geol. Ges.* Bd. xxviii. Heft 4, p 776.

Note on *Dictyonema flabelliformis* from Cambrian beds at Baltischport, with other graptolitic remains.

Davidson, Thomas. A Monograph of the British Fossil Brachiopoda. Vol. iv. part ii. no. 1, Supplement to the Jurassic and Triassic Species, pp. 73–144, pls. ix.–xvi. *Pal. Soc.*

Reviews the whole subject. 119 species and varieties of Brachiopods are described or recorded, the following being described for the first time—*Lingula Cranecæ*, *Discina*? *Moorei*, *D. Etheridgei*, *D.*? *annulosa*, *Spiriferina*? *Moorei*, *Argiope*? *Oolitica*, *Terebratula Moorei*, *Terebratulina radiata*, Moore, var. *Dundriensis*, *Terebratula Oxoniensis*, Walker (MS.), *Terebratula punctata*, var. *Radstockiensis*, *T. punctata*, var. *Havesfieldensis*, *T.*? *Hudlestoni*, Walker (MS.), and *T. Fileyensis*, Walker (MS.). H. A. N.

——. Brachiopoda. *Encyclopædia Britannica*, ed. 9, vol. iv. pp. 188–196; 25 engravings.

Contains descriptions of the fossil groups, and an account of the distribution of the class in time.

Dawson, Dr. J. W. *Eozoön Canadense* according to Hahn. *Annals*, ser. 4, vol. xviii. pp. 29–38.

A controversial paper against the objections of Hahn (see p. 278) to the organic origin of *Eozoön Canadense*, and of King and Rowney against the author's work, 'The Dawn of Life.' H. A. N.

——. On Mr. Carter's Objections to *Eozoön*. *Annals*, ser. 4, vol. xvii. pp. 118, 119.

A reply to objections against the organic nature of *Eozoön*.

Desor, Prof. E. [Silurian Fossils, Gothland.] *Bull. Soc. Sci. Nat. Neuchâtel*, t. x. cah. 3, pp. 241–244.

List of 21 sp. from Wenlock Limestone, notable for their perfection.

Dumortier, E., and **F. Fontannes.** Description des Ammonites de la Zone à *Ammonites tenuilobatus* de Crussol (Ardèche), et de quelques autres Fossiles Jurassiques nouveaux ou peu connus. [The Ammonites of the *A. tenuilobatus* zone of Crussol, and some other new or imperfectly known Jurassic Fossils.] *Mém. Ac. Lyon*, t. xxi. pp. 159 ; 19 plates. [Title entered by mistake in Geological Record for 1875, p. 386.]

28 new species of Ammonites are described, all but 2 being from the *Amm. tenuilobatus* zone, besides 6 species of Gasteropods and Lamellibranchs from other beds (see Index of Species). M. Fontannes adds some considerations on the Ammonites of the zone. H. A. N.

Duncan, Prof. P. M. On some Fossil Reef-building Corals from the Tertiary Deposits of Tasmania. *Quart. Journ. Geol. Soc.* vol. xxxii. pp, 341–351, pl. xxii.

Describes as new species *Heliastræa Tasmaniensis* and *Thamnastræa sera*, from Miocene, Table Cape. The existence of reefs around Tasmania in bygone periods where their absence is now so conspicuous may be explained by former suggestions, that the *Heliastræa* was a rapid grower, and both it and the *Thamnastræa* were true reef-building forms. They required the external conditions peculiar to coral reefs. R. E., Jun.

Etheridge, R. Appendix A.—Description of New Fossils occurring in the Arenig or Skiddaw Slates. Pp. 108–112 of J. C. Ward's Memoir on the Lake District, see p. 38.

The following new species are described—*Stella-scolites* (n. gen.) *radiatus*, *Niobe Doveri*, *Æglina binodosa*, *Asaphus* sp., *Cybele ovata*.

Etheridge, R., Jun. On the Occurrence of the Genus *Astrocrinites* (Austin) in the Scotch Carboniferous Limestone Series ; with the Description of a new Species (*A.* ? *Benniei*) and Remarks on the Genus. *Quart. Journ. Geol. Soc.* vol. xxxii. pp. 103–114, pls. xi., xii.

Quotes the definition given by Messrs. Austin of the genus *Astrocrinites*, and description of the species *A. tetragonus*, and gives reasons for retaining their generic title. Describes in detail the structure of a singular species of Echinoderm from the Carboniferous Limestone of Scotland, referred to *Astrocrinites* with doubt, from the fact that the specimens do not show the structure described in *A. tetragonus* as a "madreporiform tubercle." The Scotch form is termed *A.* ? *Benniei*. Concludes that *Astrocrinites* is an aberrant member of the Blastoidea. H. A. N.

——. On an Adherent Form of *Productus* and a small *Spiriferina* from the Lower Carboniferous Limestone Group of the East of Scotland. *Quart. Journ. Geol. Soc.* vol. xxxii. pp. 454–456, pls. xxiv., xxv.

Notices the views of previous observers as to the habits and mode of

life of the species of *Productus*. A small species is described which is found attached to the stems of Crinoids or to other foreign bodies. The mode of attachment is by the spines, which are wound round the foreign body, the ventral valve being also sometimes attached directly by its substance. In its adult state this parasitic form approaches more nearly to *P. Wrightii* than to any other; and the name *P. complectens* is suggested provisionally. Describes and figures, without naming, a species of *Spiriferina*, allied to *P. insculpta*, Phill., though differing in some points. H. A. N.

Etheridge, R., Jun. Notes on Carboniferous Mollusca. *Geol. Mag.* dec. ii. vol. iii. pp. 150–156, pl. vi.

Describes as a new species *Vincularia Benniei* from Peeblesshire. In addition *Aviculopecten ? sublobatus*, Phill., and *A. papyraceus*, Sow., are fully described and figured; colour-bands are noted as occurring on the shell of the former of these and of *Aviculopecten planoradiatus*, M'Coy; and the varietal name of *undatus* is given to a well-marked form of *Bellerophon decussatus*, Fleming. All the specimens described are from the L. Carboniferous rocks of Scotland. H. A. N.

——. South Australian Post-Tertiary Foraminifera and Ostracoda. *Geol. Mag.* dec. ii. vol. iii. p. 334.

Gives a list of 24 species of Foraminifera and 4 species of Ostracoda occurring in the Post-Tertiary [Miocene, R. Tate, 1877] beds of the Murray River Flats, S. Australia. R. E., Jun.

——. Carboniferous and Post-Tertiary Polyzoa. *Geol. Mag.* dec. ii. vol. iii. pp. 522, 523.

Proposes the name *Goniocladia* in place of *Carinella*, formerly applied to a new genus of Carboniferous Polyzoa, the latter being pre-occupied. Gives the description by **Prof. Busk**, with a figure, of *Membranipora Etheridgii* (n. sp.), from the Post-Tertiary Carse Clays of the Raised Beach series of Scotland. H. A. N.

——. Note on the Fossils from the Glacial deposits of the North-west coast of the Island of Lewis, Outer Hebrides. *Geol. Mag.* dec. ii. vol. iii. pp. 552–555.

Gives lists of the fossils from deposits, partly stratified, partly unstratified. The fossils consist principally of Gasteropods and Lamellibranchs, with several Foraminifera, *Balanus balanoides*, and a Polyzoön (*Salicornaria* sp.). Though several of the forms are of a northern type, the only two thoroughly Arctic species are *Astarte depressa* and *Pecten Islandicus*. Describes and figures certain peculiar burrows penetrating a piece of the shell of *Cyprina Islandica*, which the Rev. A. M. Norman believes to have been formed by fungi. H. A. N.

——. Further Localities for *Acanthospongia Smithii*, Young, and *Estheria Dawsoni*, Jones. *Geol. Mag.* dec. ii. vol. iii. p. 576.

The localities are from the Carboniferous rocks of Scotland. Also

notes the discovery in the Calciferous Sandstone series near Dunbar of modioliform valves of an *Estheria*, determined by Prof. Jones as apparently identical with *E. Dawsoni*. H. A. N.

Etheridge, R., Jun. Notes on some Upper Palæozoic Polyzoa from Queensland. *Trans. R. Soc. Vict.* vol. xii. pp. 66–68, plate.

Describes *Polypora ampla*, Lonsdale, and *Fenestella fossula*, Lonsdale?, from the Blackfellows diggings, Rockhampton, and *Fenestella*, sp. ind., from the Gympie Goldfield. R. E., Jun.

——. On some Species of *Terebratulina*, *Waldheimia*, and *Terebratella* from the Upper Tertiary Deposits of Mount Gambier and the Murray River Cliffs, S. Australia. *Annals*, ser. 4, vol. xvii. pp. 15–22, pls. 1 & 2.

Describes *Terebratulina? Davidsoni*, n. sp., *Waldheimia Garibaldiana*, Davidson, *W. Taylori*, n. sp., *W. Gambierensis*, n. sp., and *Terebratella compta*, Sow. Gives bibliography and geological notes. R. E., Jun.

Favre, Ernest. Description des fossiles du terrain Oxfordien des Alpes Fribourgeoises. [Oxfordian Fossils of Fribourg Alps.] *Abh. schweiz. pal. Ges.* Bd. iii. pp. 75 ; 7 pls.

The Oxfordian beds of the Châtel St. Denis and Simmenthal districts are thus divided—(1) red concretionary limestone, (2) cement-limestone, (3) grey concretionary limestone : 2 and 3 are not found together, and may be equivalents, being both overlain by 1. Under each head is a list of fossils from the chief localities. The new species are *Belemnites Dionysii*, *Amm.* (*Phylloceras*) *Molesonensis*, *Amm.* (*Aspidoceras*) *Dornasensis*, *Amm.* (*Aspidoceras*) *Candonensis*, *Amm.* (*Peltoceras*) *Gruyerensis*, *Amm.* (*Peltoceras*) *Berrensis*, *Ancyloceras Ischeri*, *Pecten Pilatensis*, *Lima Dornasensis*. *Amm. Getensis* is substituted for *Amm. Lemani* preoccupied. In all, 39 Ammonites and 34 other fossils are described. E. B. T.

Fischer, P. Note sur les coquilles des Chotts du Nord de l'Afrique. [Shells of the Chotts, N. Africa.] *Journ. Conchyl.* sér. 3, t. xvi. pp. 257, 258.

The Chotts are lagoons in Tunis and the Algerian province of Constantine, and they are regarded as the remains of a dried-up sea. On the bank of one of these, small thin specimens of *Cardium edule* and a worn valve of *Arca rhombea* were found ; from another, specimens of *Cardium edule* (the same variety), *Melania tuberculata* (a large variety now living in the oasis), and *Melanopsis cariosa*, var. *Sevillensis* (now only found in Spain), were obtained. These species indicate a brackish rather than a marine fauna. C. P. G.

Fliche, P. Faune et flore des tourbières de la Champagne. [Fauna and Flora of the Peat-Mosses of Champagne.] *Compt. Rend.* t. lxxxii. pp. 979–982.

Besides vertebrate animals and plants, notes the occurrence of several beetles and freshwater and terrestrial mollusca.

Ford, S. W. On additional Species of Fossils from the Primordial of Troy and Lansingburgh, Rensselaer County, N. Y. *Amer. Journ.* ser. 3, vol. xi. pp. 369–371.

Records the occurrence of *Palæophycus decipiens* at Troy, and describes *Microdiscus Meeki*, a new trilobite.

Foresti, Dr. L. Cenni Geologici e Paleontologici sul Pliocene Antico di Castrocaro. [L. Pliocene, Castrocaro.] *Mem. Ac. Sci. Ist. Bologna*, ser. iii. t. vi. pp. 1–56, plate (fossils and section).

Describes several new varieties of Gasteropods and Bivalves, enumerating (with passing remarks) 229 species.

Fuchs, Th. Ueber die Formenreihe *Melanopsis impressa*, *Martiniana*, *Vindobonensis*. [Serial forms of *Melanopsis*.] *Verh. k.-k. geol. Reichs.* pp. 29, 30.

Concludes that *Melanopsis Vindobonensis* coexisted from the first with *M. impressa*, and therefore was not developed out of this species through *M. Martiniana*. H. A. N.

Gabb, W. M. Note on the Discovery of Representatives of three Orders of Fossils new to the Cretaceous Formation of North America. *Proc. Ac. Nat. Sci. Philad.* ser. 3, vol. vi. pp. 178, 179, pl. v.

The new species described are *Pentacrinus Bryani*, *Goniaster mammillata*, and *Scalpellum Conradi*, being the first examples of the Crinoidea, Asteroidea, and Cirripedia from the Cretaceous Deposits of N. America. H. A. N.

Gardner, J. S. On Cretaceous Gasteropoda. *Geol. Mag.* dec. ii. vol. iii. pp. 75–78, 105–114, 160–163, pls. iii., iv.

Discusses the characters and affinities of the family of the Scalidæ. Takes up the consideration of the Cretaceous species of *Scalaria* (including the subgenus *Opalia*), and describes the new species *S. Queenii*, *S. Meyeri*, *S. ischyra*, *S. Fittoni*, *S. climaspira*, *S. cerithioides*, and *S. kalospira*. Accepts Sceley's genus *Funis*, and refers to it, as new species, *F. crebricostatus* and *F. cancellatus*. The genus *Pyrgiscus*, Philippi, is likewise accepted, *P. Gaultinus* and *P. Woodwardi* being described as new species, and the *Cerithium tenuistriatum* of Sceley being referred here. The *Scalaria angularis* of Sceley is referred to *Brachystoma*, a new subgenus of *Aporrhais*. Deals with the genus *Rissoina*, and, in addition to *R. incerta*, D'Orb., describes *R. Sowerbii* as new. All the new species are British. H. A. N.

Gemellaro, G. G. Studi paleontologici sulla fauna del calcare a *Terebratula Janitor* del nord di Sicilia. [Fauna of *T. Janitor* Limestone of N. Sicily.] 4to. *Palermo.*

Grenfell, J. G. Notes on Carboniferous Encrinites from Clifton and Lancashire. *Proc. Bristol Nat. Soc.* n. ser. vol. i. pt. 3, pp. 476–488, plate.

Records the occurrence of 4 genera of Encrinites in the base of the

Carboniferous Limestone in the Avon gorge—*Poteriocrinus*, *Cyathocrinus*, *Actinocrinus*, and *Rhodocrinus*. Gives descriptions of *Poteriocrinus plicatus*, *P. rugosus* (n. sp.), *Rhodocrinus verus*, and *R. verisimilis* (n. sp.). Discusses the genus *Gilbertsocrinus* of Phillips, pointing out that, although his description is inaccurate, the genus is well defined. Describes a new species, *G. Koninckii*, from Clitheroe. H. B. W.

Grinnell, G. B. On a new Crinoid from the Cretaceous Formation of the West. *Amer. Journ.* ser. 3, vol. xii. pp. 81–83, pl. iv.

Describes the first crinoid from the Cretaceous rocks of N. America. It belongs to a new genus of free crinoids, *Uintacrinus*, related to *Marsupites*, but apparently having 10 arms, and exhibiting other generic differences. The species is named *U. socialis*. H. A. N.

Guppy, R. J. L. On the Miocene Fossils of Haiti. *Quart. Journ. Geol. Soc.* vol. xxxii. pp. 516–532, pls. xxviii., xxix.

To a large extent critical. Remarks are made upon the characters of 122 species, all of which, except *Ditrupa dentalinum*, Guppy, are Mollusca. 21 species are figured, of which the following are new—*Sigaretus excentricus*, *Cancellaria epistomifera*, *Murex cornurectus*, *Turbinellus ædificatus*, *Cyprœa Gabbiana*, and *Phorus delectus*. H. A. N.

Hahn, Otto. Giebt es ein *Eozoön Canadense*? Eine mikrogeologische Untersuchung. [Is there such a thing as *Eozoön Canadense*? A Microgeological Investigation.] *Jahresh. Ver. Nat. Württ.* Jahrg. 32, p. 132. Translated by W. S. Dallas in *Annals*, ser. 4, vol. xvii. pp. 265–282.

Describes the characters of *Eozoön* as laid down by Carpenter. Gives the result of investigations on various serpentinous limestones. The geological, mineralogical, and zoological facts connected with *Eozoön* are criticised. Concludes that there is no ground for supposing that *Eozoön* possesses organized structure: it is of purely mineral formation. Amongst arguments brought forward is the alleged discovery of a "canal-system" in specimens of gneiss from Mont Blanc. H. A. N.

Hall, Prof. James. The Fauna of the Niagara Group in Central Indiana. 28*th Ann. Rep. New York State Mus.* p. 101, pls. iii.–xxxii.

Figures illustrating a paper in *Trans. Albany Inst.* vol. iv. (1862?).

Heer, Prof. Oswald. New Orthopterous Insect in the Coal-Measures of Scotland. *Geol. Mag.* dec. ii. vol. iii. p. 520.

Makes some additions to the paper by H. Woodward on a new Carboniferous Orthopter, see p. 298.

Hicks, Henry. Appendix to "Fossiliferous Cambrian Shales near Caernarvon" by **J. E. Marr** (see p. 24). *Quart. Journ. Geol. Soc.* vol. xxxii. pp. 135–139.

Describes the fossils found in certain Cambrian shales between Caernarvon and Bangor. The nature of these is such as to show that the

beds in question are U. Arenig. *Caryocaris Marrii* and *Æglina Hughesi* are described as new. H. A. N.

Hoernes, Dr. R. Die Fauna des Schliers von Ottnang. [Fauna of the "Schlier."] *Jahrb. k.-k. geol. Reichs.* Bd. xxv. Heft 4, pp. 333–400, tab. x.–xv.

The "Schlier" is a local Austrian name for blue and grey marls, sands, and gypsum-bands belonging to the lower division of the "Mediterranean" stage; it has been recognized in Italy [see GEOLOGICAL RECORD for 1875, p. 64] and in Malta [see above, p. 65]; a characteristic fossil is *Aturia Morrisi* (*Nautilus Aturi*). From Ottnang are described as new 15 species of Gasteropoda and 11 of Lamellibranchiata (see Index of Species, *post*), besides *Schizaster Laubei* and *Brissopsis Ottnangensis*. E. B. T.

——. Ein Beitrag zur Kenntniss der Megalodonten. [*Megalodon* and its Allies.] *Verh. k.-k. geol. Reichs.* pp. 46–48.

Discusses the characters of *Megalodon*, as illustrated by examples from the Dachstein beds.

——. Die Formengruppe des *Buccinum duplicatum*, Sow. [The Group of Forms typified by *B. duplicatum*.] *Verh. k.-k. geol. Reichs.* pp. 116–121.

A number of forms described under separate specific titles by various authors belong to a single group, of which *Buccinum duplicatum* is the type; and they are probably descended from this species. H. A. N.

Hopkinson, John. On the Distribution of the Graptolites in the Lower Ludlow Rocks, near Ludlow. *Rep. Brit. Assoc.* for 1875, *Sections*, pp. 69, 70.

Gives details as to the distribution of the Graptolitic fauna in the L. Ludlow, and adds *Monograptus Roemeri*, Barr., to previous lists.

Jones, Prof. T. R. Remarks on the Foraminifera, with especial reference to their variability of form, illustrated by the *Cristellarians*. *Micr. Journ.* vol. xv. pp. 61–92; 2 plates.

Jones, Prof. T. Rupert, and Prof. W. K. Parker. On some Recent and Fossil Foraminifera dredged up in the English Channel. *Annals*, ser. 4, vol. xvii. pp. 283–287.

Note the occurrence of many examples of *Nummulina*, *Discorbina*, *Planorbulina*, and *Alveolina* in dredgings from the British Channel, near the Channel Islands, and discuss the age of these and the method in which they reached their present position. H. A. N.

Karrer, F., and Dr. J. Sinzow. Ueber das Auftreten des Foraminiferen-Genus *Nubecularia* im sarmatischen Sande von Kischenew. [*Nubecularia* in Sarmatian Sands.] *Sitz. k. Ak. Wiss. Wien, math.-nat. Cl.* Abth. i. Bd. lxxiv. Heft 2, pp. 272–284, cut and plate.

The variability in shape of *Nubecularia novorossica*, n. sp., abundant at Kischeneff, Bessarabia, &c., is seen to be dependent on the objects round which they have grown; three chief forms of this species are described and illustrated—the solitary or simplest form, the nodular type, and the irregular or acervuline type. E. B. T.

Kawall, J. H. Organische Einschlüsse im Bergkrystall. [Organisms in Rock-Crystal.] *Bull. Soc. Imp. Nat. Mosc.* t. li. pp. 170–173.

Describes a larva-like body as *Tineites crystalli*.

Kayser, Dr. E. Ueber primordiale und untersilurische Fossilien aus der Argentinischen Republik. [Cambrian Fossils from the Argentine Republic.] *Palæontographica*, Suppl. iii. Lief. 2, pp. 1–33, tab. 1–5.

(1) From the sandstones of Provinces Salta and Jujuy 6 species are described, besides *Theca*, *Agnostus*, *Obolus*, &c., indeterminable; these are U. Primordial. The new species are *Agnostus Tilcuyensis*, *Olenus argentinus*, *Arionellus Lorentzi*, *A. Hieronimi*, *Orthis Saltensis*. (2) From the limestone formation of hills E. of the Cordilleras of San Juan 14 species are named, besides a few indeterminable; this is paralleled with Llandeilo beds. The new species from here are *Bathyurus Lajensis*, *B. Darwinii*, *B. Orbignyanus*, *Arethusina argentina*, *Monticulipora argentina*, *Maclurea Avellanedæ*, *M. Sarmienti*, *M. Stelzneri*, *Strophomena Talacastrensis*, *Leptæna Stelzneri*. (3) From the E. slopes of the Famatina range 6 species are cited, all of European or N. American occurrence previously; the age is very little younger than the preceding. Both the primordial and other Cambrian beds show an affinity in fauna to those of N. Europe rather than to the Bohemian. E. B. T.

Keeping, Walter. Notes on the Palæozoic Echini. *Quart. Journ. Geol. Soc.* vol. xxxii. pp. 35–42, pl. iii.

Shows that the interambulacral and ambulacral areas of *Perischodomus* are composed of overlapping plates; so that the genus becomes closely allied to *Lepidechinus*. The new genus *Rhoechinus* is founded for the reception of a Carboniferous urchin allied to *Perischodomus* and *Lepidechinus*, but with no primary tubercles, the single species being termed *R. irregularis*. Another Carboniferous urchin is doubtfully referred to *Palæchinus* (*P.? intermedius*), the overlapping plates not being thin and extensively imbricated as in *Perischodomus*, but thick and simply bevelled off at their edges. Some points in the anatomy of *Palæchinus gigas*, *P. sphæricus*, and *Archæocidaris Urii* are elucidated. The author remarks upon the systematic value of the Perischoechinidæ, and appends an outline classification of the Echinoidea. H. A. N.

——. On the Discovery of *Melonites* in Britain. *Quart. Journ. Geol. Soc.* vol. xxxii. pp. 395–399, figs. 1–6.

Records the first occurrence in Britain of this American genus. A large species, *M. Etheridgei*, is described from the Carboniferous Lime-

stone of Derbyshire. Amongst the more important facts contributed by this species to the elucidation of the anatomy of *Melonites* is the determination of the spines. H. A. N.

King, Prof. W., and Prof. T. H. Rowney. Remarks on 'The Dawn of Life,' by Dr. Dawson; to which is added a Supplementary Note. *Annals*, ser. 4, vol. xvii. pp. 360–377.

A controversial paper. Bring forward objections against the supposed organic nature of *Eozoön Canadense*.

Koninck, Prof. L. G. de. Recherches sur les Fossiles Paléozoïques de la Nouvelle-Galles du Sud (Australie). 8vo, pp. 140; 4to Atlas, 4 pls. *Brussels.*

Of the 59 Silurian species, 13 are new and 8 doubtful. They are all of U. Silurian type, and belong to genera represented in Europe and America by closely allied forms. Two horizons are recognizable:—a lower, corresponding to the U. Llandovery; and an upper, to the Ludlow series. The species are nearly equally divided between the two groups, 32 occurring in the lower and 27 in the upper. In the former the fauna is almost exclusively molluscan and crustacean, whilst in the latter corals and crustacea chiefly abound. 67 Devonian species are described, of which 30 are new and have their representative forms in European or American rocks, except 4—*Archæocyathus ? Clarkei*, *Billingsia alveolaris*, *Niso Darwinii*, and *Mitchellia striatula*. The U. Devonian is indicated by several known species; a lower horizon is indicated by others. Under the name of *Mitchellia* is described a new genus of Buccinidæ, with an elongated and much contracted mouth. The Tertiary genus *Niso* is also found to occur in these Devonian rocks. For names of new species see Index of Species, under Mollusca, Crustacea, Actinozoa, and Plants. R. E., Jun.

Lapworth, Charles. On the Scottish Monograptidæ. *Geol. Mag.* dec. ii. vol. iii. pp. 308–321, 350–360, 499–507, 544–552, pls. ix.–xiii. & xx.

Defines the Monograptidæ as including the genera *Rastrites*, *Monograptus*, and *Cyrtograptus*, and describes all the species known as occurring in the Silurian rocks of Scotland. Discusses the succession of the Silurian deposits of S. Scotland, the distribution of Graptolites in them, the vertical range of the Monograptidæ, the synonymy of the genera, and the structural and developmental characters of the forms. Gives descriptions of the Scottish species, in most cases with figures. 15 new species and 3 varieties are described. The genus *Dimorphograptus*, with two new species, is proposed for some singular forms which commence their existence as monoprionidian types, but become diprionidian in the course of their growth. Concludes with a table showing the vertical range of the species of Scottish Monograptidæ, from which various general considerations affecting the stratigraphical

relations of the Silurian rocks of S. Scotland are deduced. For list of new names see Index of Species. H. A. N.

Lebour, G. A. Note sur deux fossiles du Calcaire carbonifère du Northumberland. [Two Fossils from the Carboniferous Limestone of Northumberland.] *Ann. Soc. Géol. Belg.* t. iii. pp. 21–24.

Discusses the presence of two N. American forms in these beds:—*Lingula Scotica*, Dav., recorded from the Carboniferous of Nebraska; and *Agelacrinites* (*Lepidodiscus*) *squamosus*, Meek and Worthen, found in the Keokuk beds (L. Carboniferous) of Indiana, but not previously known generically out of Silurian rocks in Europe. G. A. L.

Lindström, Dr. G. On the Affinities of the Anthozoa Tabulata. *Annals*, ser. 4, vol. xviii. pp. 1–17. Reprinted from the *K. Svenska Vet.-Akad. Handl.* Bd. ix. 1873.

Discusses the structure and affinities of the tabulate corals, with especial reference to the Palæozoic forms. The presence of tabulæ is concluded not to be a feature of classificatory importance; and the group is shown not to be a natural assemblage, some of the forms referred to here being true corals, whilst others are hydrozoan or polyzoan in their affinities. Details are given as to the development of some of the Palæozoic tabulate corals, with a provisional arrangement of the two most important groups, the Favositidæ and the Heliolitidæ. H. A. N.

Linnarsson, Dr. G. On the Brachiopoda of the Paradoxides Beds of Sweden. *Bihang k. Svenska Vet. Akad. Handl.* Bd. iii. no. 12, pls. i.–iv.

Gives a history of the Primordial strata of Sweden. The following new species are described and figured—*Orthis exporrecta*, *Lingulella* (?) *Nathorsti*, *Obolus*? sp. indet., *Acrothele coriacea*, *A. granulata*, *Kutorgina cingulata*, Bill., var. *pusilla*, and *Iphidea ornatella*. The name *Acrothele* is proposed for certain small Brachiopods allied to *Obolella* and *Acrotreta*. A list of the fossils of the *Paradoxides* beds is given. H. A. N.

Loriol, Ph. de. Monographie paléontologique des couches de la zone à *Ammonites tenuilobatus* de Baden (Argovie). 1 part. [Palæontology of Baden Beds.] *Abh. schweiz. pal. Ges.* Bd. iii. pp. 32; 4 pls.

The succession of Jurassic beds in Canton Aargau shows that the *Amm. tenuilobatus* beds are simply a facies of the Astartian. The fossils here described are all from Baden, those of other localities not being admitted. The following are new—*Serpula thermarum*, *S. Mœschi*, *S. Argoviensis*, *S. connexa*. E. B. T.

——. Description des Echinides tertiaires de la Suisse. [Swiss Tertiary Echinidæ.] *Abh. schweiz. pal. Ges.* Bd. iii. pp. 65–142, pls. 9–23. [Continuation, see Geological Record for 1875, p. 313.]

Contains descriptions of *Echinolampas* 7 species, *Conoclypeus* 4, *Cy-*

claster 1, *Hemiaster* 1, *Brissopsis* 2, *Linthia* 2, *Schizaster* 2, *Pericosmus* 1, *Prenaster* 2, *Echinocardium* 1, *Macropneustes* 2, *Euspatangus* 2, *Spatangus* 2; there are no new names. The number described in the whole memoir is 53, of which 43 are from the Eocene. The fossil Echinidæ from Switzerland described by De Loriol number 438. E. B. T.

Loriol, Ph. de. Note sur quelques Espèces Nouvelles appartenant à la Classe des Échinodermes. [New Echinoderms.] *Mém. Soc. Phys. Hist. Nat. Genève*, t. xxiv. pp. 659–673, pl. i., ii.

Describes and figures the following new species:—*Enallaster Karsteni*, Neocomian?, Ecuador; and *Astropecten Pilleti*, L. Neocomian, France. Gives the name *Pseudocidaris Saussurei* to *Cidaris glandifera*, Galeotti (non Goldf.) W. H. D.

Lotti, B. Di alcune recenti scoperte paleontologiche nei dintorni di Massa Marittima nella provincia di Grosseto. [Palæontology of Massa Marittima.] Pp. 6. 4to. *Rome.*

Lundgren, Bernhard. Om *Inoceramus asterna* i kritformation i Sverige. [Species of *Inoceramus* in the Cretaceous of Sweden.] *Geol. Fören. Stockholm Förh.* Bd. iii. pp. 89–96, pl. v.

Treats historically and critically of the Swedish Cretaceous *Inocerami.*

——. Om Belemniterna i Sandkalken i Skåne. [Belemnites in the Calcareous Sandstones of Scania.] *Öfv. k. Vet.-Akad. Förh.* Arg. xxxiii. no. 10, pp. 15–21.

Treats of the species of Belemnites and of their associated fossils.

——. [Crinoids in the Chalk of Sweden.] *N. Jahrb.* Heft ii. pp. 180–182.

Crinoid stems have been found in the Chalk of Köpinge, near Ystad, and have been commonly referred to *Bourgueticrinus.* But a calyx lately discovered comes very near to *Antedon Fischeri*, Geinitz. F. W. R.

McCoy, Prof. F. Prodromus of the Palæontology of Victoria; or, Figures and Descriptions of Victorian Organic Remains. Decade iii. pp. 40, pls. 10. 8vo. *Melbourne and London.*

The following new U. Silurian trilobites are figured and described—*Forbesia euryceps*, *Lichas australis*, and *Homalonotus Harrisoni.* Among the Tertiary species described are *Thylacoleo carnifex*, Owen, the only specimen extant exhibiting all the teeth in front of the carnassial in the upper jaw *in situ* (modifications in the synonymy are proposed), and the following new species of Mollusca:—*Pleurotomaria tertiaria*, *Haliotis orinoides*, and *H. Mooraboolensis*, U. Miocene; *H. nerosoides* and *Cerithium Flemingtonensis*, L. Pliocene; *Trigonia Howitti* and *Cucullæa Corioensis*, Oligocene and Miocene; *Cyprœa* (*Aricia*) *gigas*, *C.* (*Trivia*) *arellanoides*, and *C.* (*Aricia*) *platypyga*, Oligocene; *C.* (*Aricia*) *platyrhyncha*, Miocene. R. E., Jun.

M'Coy, Prof. F. Prodromus of the Palæontology of Victoria; or, Figures and Descriptions of Victorian Organic Remains. Decade iv. Pp. 32. 8vo. *Melbourne.*

New forms described are *Diprotodon longiceps* (Post Tertiary), *Pecten Yahlensis* (Woods), var. *semilævis*, *Voluta strophodon*, *Spondylus gaderopoides*, and the plants (Tertiary) *Eucalyptus pluti* and *Cinnamomum polymorphoides*. Of Palæozoic fossils the new forms described are *Chonetes australis*, *Phragmoceras subtrigonum*, *Asterolepis ornata* (Eichw.), var. *australis*, and the plants *Archæopteris Howitti*, *Sphenopteris Iguanensis*, and *Cordaites australis*, Devonian. R. E., Jun.

——. On a New Victorian Graptolite. *Annals*, ser. 4, vol. xviii. p. 126, woodcut.

Describes *Didymograptus Thureaui* from Llandeilo flags of the Bendigo (Sandhurst) Goldfield, distinguished by the regular zigzag bendings of the four branches of the funicle, &c. For such forms as this, in which the branches of the funicle are angularly bent at the points of budding into the celluliferous stems, the generic name *Goniograptus* is proposed. R. E., Jun.

——. On the Discovery of the *Trigonia acuticostata*, M'Coy, in the Living State. *Annals*, ser. 4, vol. xviii. p. 273.

A Miocene and hitherto supposed extinct species. Dredged in Bass's Straits. The nacre of the interior is pearly white.

Mascke, H. *Clinoceras*, n. gen. ein silurischer Nautilide mit gelappten Scheidewänden. [New Nautiloid Genus.] *Zeitsch. deutsch. geol. Ges.* Bd. xxviii. Heft 1, pp. 49–56, pl. 1.

Clinoceras is a new genus occurring in erratic L. Silurian blocks in Prussia; *C. dens* is described; other species are indicated by fragments. Only a few septa are preserved, the rest of the cone being filled with mineral matter. Shell conical (allied to *Loxoceras*, M'Coy), the siphuncle-side straight, the others more or less curved; a constriction below the body-chamber. Septal border with an obtuse-angled saddle on the siphuncle-side, with gently rounded lobes and two slightly marked lateral saddles. Siphuncle $\frac{1}{12}$ to $\frac{1}{3}$ of diameter from the wall. E. B. T.

Maurer, Friedrich. Palæontologische Studien im Gebiet des rheinischen Devon. 3. Die Thonschiefer des Ruppbachthales bei Diez. [Rhenish Devonian Palæontology. 3. Clay-slates of the Ruppbachthal, near Diez.] *N. Jahrb.* Heft 8, pp. 808–848; plate.

Describes the stratigraphical and petrographic characters of the beds and their palæontological relations. The new species described are *Bronteus cameratus* and six Cephalopods: see INDEX. F. W. R.

Mayer, Charles. Catalogue des Fossiles du terrain nummulitique des environs d'Einsiedeln. [Catalogue of the Nummulitic Fossils of Einsiedeln.] *Bull. Soc. Géol. France*, sér. 3, t. iv. pp. 361–363.

An anticipatory account of the 14th part of the "Matériaux pour la Carte Géologique de la Suisse." The new genus *Pseudoplacuna*, and the new subgenera *Oncoma* (*Strombus*), *Harpopsis*, and *Silia* (*Harpa*) are founded. H. A. N.

Mayer, Charles. Description de Coquilles fossiles des terrains Tertiaires supérieurs (suite). [U. Tertiary Fossil Shells, continued.] *Journ. Conchyl.* sér. 3, t. xvi. pp. 168–180, pls. vi., vii.

Describes 11 Lamellibranchs: see Index of Species.

Meek, Prof. F. B. A Report on the Invertebrate Cretaceous and Tertiary Fossils of the Upper Missouri Country. *Rep. U. S. Geol. Surv. Terr.* vol. ix. pp. lxiv, 629; 45 pls., 85 woodcuts.

Preliminary notices of nearly all the new species have been published, in conjunction with Dr. Hayden, in Proc. Ac. Nat. Sci. Philad., chiefly from 1856–1862. These brief descriptions have been rewritten and enlarged, while full descriptions of the genera and subgenera, with their synonymy and references, and remarks on their geological and geographical ranges, have been added. Pp. xxi–lxiv give a general account of the nature and extent of the geological formations in the region, the undoubted marine Cretaceous strata, the brackish and freshwater deposits of the lignitic series, and the unquestionable Tertiary beds, most of which are freshwater. The Cretaceous fossils take pp. 1–508. The new genus *Microstiza* (sp. *M. millepunctata*) is proposed for a fossil doubtfully referred to the Alcyonaria; *Vanikoropsis* is a new genus of Gasteropods; and *Mortoniceras* and *Placenticeras* are new genera of Ammonitidæ. Several subgenera are also founded. 10 new species and 7 varieties of Mollusca are described (see Index of Species). Out of 63 fossils of the fresh and brackish-water beds of the lignitic formation, 4 species and 2 varieties of Gasteropods are new (see Index). Out of 10 Tertiary species, *Limnæa Shumardi* alone is new. In an appendix are descriptions of two Cretaceous species accidentally omitted. H. A. N.

——. Report of the Palæontological Collections of the Expedition. *Appendix J* (pp. 337–373, pls. i.–v.) *to Report of Explorations across the Great Basin of the Territory of Utah*, in 1859, by Capt. J. H. Simpson. See p. 142.

The fossils described are referable to the Devonian, Carboniferous, Permian, Jurassic, Cretaceous, and Tertiary periods. The Report was written in 1860; but its publication was delayed. Owing to this fact, the 25 new species described in it were all published in a series of brief notices in Proc. Ac. Nat. Sci. Philad. (1860). These species are here more fully described and figured, and there are likewise descriptions of 13 other previously recorded forms. Concludes with a catalogue of the fossils collected by the exploring party. H. A. N.

——. Descriptions of the Cretaceous Fossils collected on the San Juan Exploring Expedition under Capt. J. N. Macomb [see **Newberry**, p. 138], pp. 121–133, pls. i., ii.

Written in 1860, but publication delayed. Contains descriptions and figures of 14 species of Cretaceous fossils, of which the following are new—*Ostrea* (*Gryphæa*?) *uniformis*, *Exogyra columbella*, *Anomia nitida*, *Caprotina* (*Requienia*?) *bicornis*, *Plicatula arenaria*, *Crassatella Shumardi*, *Cyprimeria*? *crassa*, *Cardium bellulum*, *Actæon intercalaris*, *Anchura*? *Newberryi*, and *Prionocyclus*? *Macombi*. H. A. N.

Meek, Prof. F. B. Descriptions and Illustrations of Fossils from Vancouver's and Sucia Islands, and other North-western Localities. *Bull. U. S. Geol. Surv. Terr.* vol. ii. pp. 351–374, pls. i.–vi.

The Carboniferous fossils are referred to the Mountain Limestone, the Komooks or Komax beds to the Fort Pierre group (New Jersey Greensand and Upper Chalk), and the Nanaimo beds to a lower and possibly Jurassic stage. The 25 species noticed have all been described previously, but not fully, and not always figured. W. H. D.

——. Note on the new Genus *Uintacrinus*, Grinnell. *Bull. U. S. Geol. Surv. Terr.* vol. ii. pp. 375–378, woodcut.

Describes *U. socialis*, Niobrara group (Cretaceous), Kansas, from better specimens than Mr. Grinnell's. See p. 278.

——. Notice of a very large Goniatite from Eastern Kansas. *Bull. U. S. Geol. Surv. Terr.* vol. ii. p. 445.

Meneghini, Prof. G. I Crinoidi Terziarii. [Tertiary Crinoids.] *Atti Soc. Tosc. Sci. Nat.* vol. ii. pp. 36–59.

Describes amongst others the following new species—*Pentacrinus Guiscardii* and *P. Pellegrini* from the Veronese, *Conocrinus Seguenzai* from Piedmont, and a *Rhizocrinus*?. W. H. D.

——. Nota sulle Ammoniti del Lias Superiore descritte dal Sig. Eug. Dumortier. [U. Lias Ammonites described by Dumortier.] *Atti Soc. Tosc. Sci. Nat.* vol. ii. pp. 85–88.

Objects to the subdivision of certain species according to minor or individual peculiarities.

Meneghini and **Bornemann.** Nota sulla Struttura degli Aptici. [Structure of *Aptychi*.] *Atti Soc. Tosc. Sci. Nat.* vol. ii. pp. 89–97.

Meunier, Stanislaus. Tableau Synoptique résumant la distribution des Mollusques fossiles dans les couches tertiaires du bassin de Paris. [Table of the Distribution of Tertiary Mollusca in the Paris Basin.] *Compt. Rend.* t. lxxxiii. pp. 1054–1056.

In determining the origin and descent of species, the palæontologist ought to commence with some local fauna, which has been so far worked out that future researches are not likely to add much fresh material. In accordance with this principle, the author has drawn up this Table of 2886 species, showing their distribution in the successive beds. H. A. N.

Milaschewitsch, C. Korallen der Nattheimer Schichten. [Corals of Nattheim Beds.] *Palæontographica*, Bd. xxi. Lief. 8, pp. 205–243, tab. 46–51. Continuation: see GEOLOGICAL RECORD for 1875, p. 298.

Epistreptophyllum is a new genus having some characters of Astræidæ and some of Fungidæ. A new classification of the Poritidæ is put forth in an analytical Table; *Thamnastræa*, &c. are transferred here, their structure being newly interpreted. The corals described above as *Thamnastræa gibbosa*, *Th. robuste-septata*, *Th. heterogenea* are now removed to the genus *Astræomorpha*. In the Poritinæ two new genera are constituted—*Haplarœa* and *Diplarœa*. The genus *Dimorphoseris* (Duncan) is ranged as synonym of *Microsolena*. For the names of the 14 new forms described, see Index of Species. E. B. T.

Moseley, H. N. On the Structure and Relations of the Alcyonarian *Heliopora cœrulea*, with some Account of the Anatomy of a Species of *Sarcophyton*, Notes on the Structure of Species of the Genera *Millepora*, *Pocillopora*, and *Stylaster*, and Remarks on the Affinities of certain Palæozoic Corals. *Phil. Trans.* vol. clxvi. pp. 91–129, pls. viii., ix.

Points out the close alliance between the recent *Heliopora* and the extinct *Heliolites*, and forms the family Helioporidæ for the reception of these two genera along with *Polytremacis*. Discusses the affinities of the Favositidæ and *Chætetes*, and inclines to the belief that these forms should be referred to the *Alcyonaria*. H. A. N.

Munier-Chalmas, —. Mollusques nouveaux des terrains paléozoiques des environs de Rennes. [New Palæozoic Mollusca from the neighbourhood of Rennes.] *Journ. Conchyl.* ser. 3, t. xvi. pp. 102–109.

Describes the new genera *Oriostoma* (allied to *Platyceras*), *Adranaria* (allied to *Cultellus*), *Cardiolaria* (allied to *Cardiola*), and 20 new species, for the names of which, see Index of Species. C. P. G.

Neumayr, Dr. M. Beiträge zur Kenntniss fossiler Binnenfaunen. 7. Die Süsswasser Ablagerungen im südöstlichen Siebenbürgen. [Freshwater Fossils, S. Transylvania.] *Jahrb. k.-k. geol. Reichs.* Bd. xxv. Heft 4, pp. 410–431, pls. 16, 17.

The fossils are chiefly from near Vargyas or Arapatak (Transylvania). [For geology, see **Herbich** and **Neumayr**, p. 74.] *Cardium Fuchsi* and 14 Gasteropods described as new: see Index of Species. E. B. T.

——. Die Formenreihe der *Melanopsis impressa*. [The Serial Forms of *Melanopsis impressa*.] *Verh. k.-k. geol. Reichs.* pp. 53, 54.

Admits that Fuchs's new observations have rendered the derivation of *Melanopsis Vindobonensis* from *M. impressa* untenable (see p. 277).

Newberry, Prof. J. S. Descriptions of the Carboniferous and Tri-

assic Fossils collected on the San Juan Exploring Expedition [see p. 138]. Pp. 137–148, pls. iii.–viii.

Written in 1860, but publication delayed. A few additional references have been inserted. The new Invertebrates described are *Productus nodosus* and *Pleurotomaria excelsa*, both Carboniferous. H. A. N.

Nicholson, Prof. H. A. Supposed Laurentian Fossil. *Annals*, ser. 4, vol. xviii. p. 75.

The specimens from the metamorphic rocks of Harris, supposed to be organic, have proved to be of a mineral nature.

——. Notes on the Palæozoic Corals of the State of Ohio. *Annals*, ser. 4, vol. xviii. pp. 85–95, pl. v.

Rectifies some errors in the 'Report on the Corals of Ohio' (Geol. Survey of Ohio; Palæontology, vol. ii.), and describes the microscopic structure of 14 species of *Chætetes*, of *Dekayia attrita*, and of *Streptelasma corniculum*. H. A. N.

Nicholson, Prof. H. A., and **James Thomson**. Descriptions of some New or Imperfectly-understood Forms of Palæozoic Corals. *Proc. R. Soc. Edin.* vol. ix. pp. 149, 150. (Abstract.)

The structure of *Heliophyllum* described; and the new genus *Crepidophyllum* proposed for Devonian corals having the general structure of *Heliophyllum*, but with the central tabulate area enclosed by a distinct accessory wall. To this genus belongs *Diphyphyllum Archiaci* and the typical forms of *Heliophyllum subcæspitosum*. The genus *Thysanophyllum* founded for Carboniferous corals allied to *Lonsdaleia*, but with no columella, and having the centre of the visceral chamber occupied by strong horizontal tabulæ. *T. orientale* and *T. minus* described as species. The name of *Lindströmia* proposed for some simple Devonian corals, possibly belonging to the *Aporosa*, and the species *L. columnaris* described. H. A. N.

—— ——. Descriptions of New Species of Corals from the Carboniferous Rocks of Scotland. *Proc. Phil. Soc. Glasg.* pp. 14, pls. i., ii.

Describe and figure 12 new species from the L. Carboniferous of W. Scotland: see Index of Species.

—— ——. Organic Remains in the Metamorphic Rocks of Harris. *Annals*, ser. 4, vol. xvii. p. 414. [See **Nicholson**, above.]

Specimens, believed to be of an organic nature, have been obtained by Mr. J. Thomson from the metamorphic rocks of Harris.

Perceval, S. G. On the Discovery of *Palæacis cuneata*, Meek and Worthen, in Carboniferous Limestone near Henbury, Bristol. *Geol. Mag.* dec. ii. vol. iii. pp. 267, 268.

Records the occurrence of specimens of a small coral determined as *Palæacis* (*Sphenopoterium*) *cuneata*.

Philippi, Dr. R. A. *Cothocrinites*, ein neues Geschlecht der fossilen

Crinoideen. [New Genus of Crinoids.] *Zeitsch. gesammt. Nat.* n. F. Bd. xiii. pp. 68–71, pl. ii. A.

A description of a Crinoid in the Santiago Museum, to which the name of *Cothocrinites verrucosus* is given. Its locality is not known; but it is probable, judging from the matrix, that it was from the rock of Doña Ana, in the province of Coquimbo. E. T. N.

Piette, Ed. Note sur les Coquilles ailées des mers jurassiques. [Winged Shells of Jurassic Seas.] 7 pp. *Laon.*

Raincourt, M. de. Description d'espèces nouvelles du bassin de Paris. [New Species from the Paris Basin.] *Bull. Soc. Géol. France*, ser. 3, t. iv. pp. 290–293, pl. v., and pp. 352–355, pl. x.

The genus *Vulsinella* is founded on bivalves allied to *Vulsella*. Describes 18 species of Gasteropoda and Lamellibranchiata, for the names of which see Index of Species. H. A. N.

Rayneval, le Comte. Coquilles fossiles de Monte Mario. Terrains Tertiaires des environs de Rome. [Fossil Shells of Mt. Mario. Tertiary Beds near Rome.] Pp. 4. 2 pls. Fol. *Paris.*

The plates were printed in Rome in 1856, but not published, and were found after the death of Count Rayneval. The Gasteropods and Lamellibranchs figured were obtained with others near Rome. The characters of the beds, as well as their relation to the surrounding strata, are described. 210 out of about 270 species are now found living in the Mediterranean, where, however, they are mostly very rare; about 60 are extinct. Some of the commoner shells of the Mediterranean are wanting in these deposits. This *Subapennine formation* is referred to the Older Pliocene, and is believed to have been deposited during a period of repose, intermediate between the upraising of the Apennines and the more recent chain of volcanoes of Italy and Sicily. E. T. N.

Reynès, Prof. P. Description de quelques espèces d'Ammonites qui se trouvent dans le Muséum d'histoire naturelle de la ville de Marseille, précédée de quelques observations sur les principes de classification de ces mêmes êtres. [Descriptions of Ammonites in the Marseilles Museum, with Remarks on their Classification.] *Bull. Soc. Sci. Indust. Marseille*, t. iv. pp. 90–108.

Insists upon the necessity of distinguishing the forms and ornamentations peculiar to age and sex. Describes 45 new species of *Ammonites* from the *Inoceramus-labiatus* Chalk, Gault, Aptian, U. and L. Neocomian. Makes observations on some unrolled Cephalopods, and describes 10 new species of *Ancyloceras*, &c. from U. and L. Neocomian. For the names, see Index of Species. G. A. L.

Roemer, Prof. Ferdinand. Lethæa geognostica, oder Beschreibung und Abbildung der für die Gebirgs-Formationen bezeichnendsten Versteinerungen. Herausgegeben von einer Vereinigung von Palä-

ontologen. [Figures and Descriptions of Characteristic Fossils.] Part I. Lethæa Palæozoica. Atlas, with 62 plates.

Text not yet published. Many new species figured, and some new generic types both figured and defined. *Salpingostoma* is proposed for forms of *Bellerophon* in which the mouth is suddenly dilated, and is applied to the penultimate volution without being penetrated by it. The mouth is not notched behind; but the last volution has a short slit just before expanding into the mouth. *Euomphalopterus* is founded for *Euomphali* of the type of *E. alatus*, in which the outer edge of the whorls is prolonged into a knife-like compressed border or alation, the sharp edge of which is perforated with fine pores. *Odontomaria* is proposed for Gasteropods resembling *Pleurotomaria*, but having the shell unrolled, and forming a simply bent tube. H. A. N.

Roemer, Prof. Ferdinand. Notiz über ein Vorkommen von fossilen Käfern (Coleopteren) im Rhät bei Hildesheim. [Fossil Beetles in the Rhætic near Hildesheim.] *Zeitsch. deutsch. geol. Ges.* Bd. xxviii. pp. 350–353; 3 woodcuts.

Three specimens from the Rhætic insect-bed lying over the lower bone-bed breccia at Krälah near Hildesheim are figured and described. Two are named *Elateropsis infraliassica* and *Helopides Hildesiensis*. The third is not generically determinable. G. A. L.

——. [Palæontological Notes.] *N. Jahrb.* Heft v. pp. 527–530.

Notes on Carboniferous Limestone fossils from Sumatra, pointing out their similarity to European forms. Sketch of Dr. Lindström's palæontological work, and reference to Feistmantel's researches on Indian fossil plants. F. W. R.

Rominger, Dr. C. Geological Survey of Michigan. Palæontology. Fossil Corals. Pp. 154; 55 plates. 8vo. *New York.*

The copy examined bears upon its titlepage "Advance Copy, unrevised by the Author." This may explain the fact that the figures in the photographic plates are without numbers or names, and that there are no explanations to the plates other than may be found in the text. In the identification of species with forms described by previous writers, with few exceptions, no synonymy is given. A large number of corals from the Silurian and Devonian formations of Michigan are described and figured, of which 77 are brought forward as new (see Index of Species). The new genera *Houghtonia*, *Quenstedtia* [preoccupied for a genus of Lamellibranchiata], and *Vesicularia* [preoccupied for a genus of Polyzoa] are proposed. H. A. N.

Rutot, A. Notes sur les Divisions à établir entre quelques espèces de grandes Rostellaires des Terrains Eocène et Oligocène. [Eocene and Oligocene Species of large *Rostellariæ*.] *Ann. Soc. Géol. Belg.* t. iii. pp. 76–79, pl. ii.

Recognizes 3 species:—*R. ampla*, Brand; *R. macroptera*, Lam.; and

R. robusta, Rutot. [The last afterwards abandoned as synonymous with *R. ampla*.] H. A. N.

Rutot, A. Note sur quelques fossiles recueillis dans le Diluvium des Environs de Tongres. [Note on some fossils found in the diluvium of the neighbourhood of Tongres.] *Ann. Soc. Mal. Belg.* t. x. *Mém.* pp. 7–20, pl. i.

Describes some Oligocene fossils from diluvium near Tongres. Almost all are Mollusca, and several are new to Belgium. *Fusus Loozi*, *Pleurotoma nodularis* (non Desh.), *Cerithium Loozi*, and *Neritina Dewalquei* are new. H. A. N.

Schlüter, Dr. Clemens. Cephalopoden der oberen deutschen Kreide. (2 Theil.) [Cephalopoda of German U. Cretaceous.] *Palæontographica*, Bd. xxiv. Lief. 1–4, pp. 123–263, pls. 36–55.

Continues with *Turrilites*, of which 13 species are described; *Baculites* 7 species, *Bac. brevicosta* being a new species from the Ems marl. In a supplement to the Ammonites of a former volume we find the following new species:—*A. Alstadenensis*, *A. Mengedensis*, *A. Emscheris*, from the Ems marl of Westphalia; *A. Dolbergensis* from the *mucronata*-zone. The appellations *A. striatocostatus*, *A. robustus*, *A. scaphitoides*, being preoccupied, they are here changed to *A. Vari*, *A. Wittekindi*, and *A. Lemfœrdensis* respectively. Of *Nautilus* are new:—*N. tenuicostatus*, *N. cenomanensis*, *N. anguliferus*, from the Cenomanian; *N. Tourtiæ* and *N. Sharpei* from the "Tourtia;" *N. leiotropsis* from Ems marl; *N. Ahltenensis*, *N. Darupensis*, and *N. corticatus* from the *mucronata*-zone. Under *Belemnitella* are ranged 3 species—*B. mucronata*, *B. lanceolata*, and *B. Hoeferi*; these differ from the remainder of the group for which the genus *Actinocamax* is revived.

The distribution of species is discussed—lists of characteristic fossils, and a special one of Cephalopoda, being given for each of the zones adopted [see above, p. 108]. E. B. T.

Schwager, Corr. Saggio di una classificazione dei Foraminiferi avuto riguardo alle loro famiglie Naturali. [Classification of Foraminifera.] *Boll. R. Com. geol. Ital.* t. vii. pp. 475–485.

Divides the Order thus:—I. Porous and purely calcareous. II. Agglutinant. III. Without pores, purely calcareous. IV. With a chitinous shell. Group I. is further subdivided: 1, forms with chambers disposed in a single row and in one plane; 2, chambers in one row and turbinate; 3, two or more rows of chambers, e. g. *Textilaria*; 4, chambers more or less complicated, e. g. *Polytrema*. E. B. T.

Scudder, S. H. Fossil Coleoptera from the Rocky Mountain Tertiaries. *Bull. U. S. Geol. Surv. Terr.* vol. ii. pp. 77–87.

Describes, from the Green River group, Wyoming, 25 new species; and from South Park, Colorado, the new genus *Oryctoscirtetes* and 6 new species. For the new names, see Index of Species. W. H. D.

Scudder, S. H. Brief Synopsis of North American Earwigs, with an Appendix on the Fossil Species. *Bull. U.S. Geol. Surv. Terr.* vol. ii. no. 3, pp. 249–260. (Fossil Species, pp. 259, 260.)

scribes *Labidura lithophila*, a new Tertiary species, from near orissant, Colorado.

——. Fossil Orthoptera from the Rocky Mountain Tertiaries. *Bull. U.S. Geol. Surv. Terr.* ser. 2, no. 6, pp. 447–449.

Describes *Homœogamia ventriosus* [*? ventricosa*] (a cockroach) and *Labidura tertiaria* (an earwig), both from South Park, Colorado. Mentions other fossil earwigs. W. H. D.

——. Fossil Palæozoic Insects. *Geol. Mag.* dec. ii. vol. iii. pp. 519, 520.

Makes additions and corrections to a paper by H. Woodward on a new Carboniferous Orthopter (see p. 298), and gives a list of the *Insecta*, *Arachnida*, and *Myriapoda* of the Carboniferous Rocks of N. America. H. A. N.

——. Post-Pliocene Fossils from Sankoty Head, Nantucket. *Proc. Boston Soc. Nat. Hist.* vol. xviii. pp. 182–185.

The fossils alluded to are marine shells, which lie above the clays. Remarks are made upon the gravels, sands, and clays.

Seguenza, G. Studii stratigrafici sulla Formazione pliocenica dell' Italia Meridionale. [Pliocene Fossils of S. Italy.] *Boll. R. Com. geol. Ital.* t. vii. pp. 8–15, 91–103, 179–189, 259–271, 355–359.

Continuation of Catalogue of Mollusca from the upper zone of the Older Pliocene of S. Italy. [See Geological Record for 1874, p. 95; and for 1875, p. 97.] E. B. T.

——. Ricerche Paleontologiche intorno ai Cirripedi Terziarii della Provincia di Messina, con appendice intorno ai Cirripedi viventi nel Mediterraneo, e sui fossili terziari dell' Italia meridionale. Pt. ii. [Tertiary Cirripeds of Messina and S. Italy.] *Atti Ac. Pontan.* vol. x. pp. 1–113, pls. vi.–x.

——. Cenni intorno alle Verticordie fossili del Plioceno Italiano. [*Verticordiæ* of Italian Pliocene.] *Rend. R. Ac. Sci. Napoli*, fasc. 6, pp. 1–9.

Describes the species, giving full synonymy, the following being new—*Verticordia mytiloides*, *V. axinoides*, and *V. orbiculata*.

——. Studi paleontologici sulla fauna malacologica dei sedimenti pliocenici depositati a grandi profondità. [Deep-sea Pliocene Mollusca.] *Boll. Soc. Mal. Ital.* vol. ii. pp. 34.

Remarks on the fauna, with bibliography; continuation of article in vol. i. (26 pp.) imperfectly noticed in the Geological Record for 1875, p. 323. W. H. D.

Sintzof, —. [New and little-known Tertiary Shells of New Russia.] *Zapiski Novoruss. Obw. Estest.* vol. iv.

Sollas, W. J. On *Eubrochus clausus*, a Vitreo-hexactinellid Sponge from the Cambridge "Coprolite" Bed. *Geol. Mag.* dec. ii. vol. iii. pp. 398–403, pl. xiv.

Describes and figures a remarkable siliceous sponge, a derived fossil from the U. Gault. It is a clavate solid sponge, the skeleton of which consists of an originally siliceous network, characterized by sexradiate knots, filling the interior, and forming on the exterior a rectangular meshwork. The genus *Eubrochus* is founded for its reception; and its relations with *Farrea* are pointed out. H. A. N.

——. On the Glauconitic Granules of the Cambridge Greensand. *Geol. Mag.* dec. ii. vol. iii. pp. 539–544, pl. 21.

Treats of the minute bodies included in the phosphatic nodules of the Cambridge Greensand, as shown by transparent sections. Some of these bodies are arenaceous and perforate calcareous Foraminifera. Others are glauconitic granules, which contain in their interior minute Foraminifera, coccoliths, coccospheres, and other bodies. The coccoliths and coccospheres are specially treated of, and various forms figured. Concludes that the precipitation of glauconite has been determined by the presence of animal matter; and whilst many granules show some nucleus, such as a Foraminifer or a coccosphere, other granules, which show no such nucleus, have been the result of the deposition of glauconite round the decaying matter of soft-bodied Protozoa and Protista. H. A. N.

Sordelli, F. Nuove osservazione sulla fauna fossile di Cassina Rizzardi. [Fossils from Cassina Rizzardi.] *Atti Soc. Ital. Sci. Nat.* vol. xviii. pp. 437–465.

Stefani, Carlo de. Molluschi Continentali fino ad ora notati in Italia nei Terreni Pliocenici ed ordinamento di questi ultimi. *Atti Soc. Tosc. Sci. Nat.* vol. ii. pp. 130–174.

General review of the Pliocene fauna of S. Europe, with many lists.

——. Descrizione delle nuove specie di molluschi pliocenici raccolti nei dintorni di San Miniato al Tedesco. [New Species of Pliocene Mollusca, San Miniato.] Pp. 6, plate. 8vo. *Pisa.*

——. Notizie sopra alcuni molluschi pliocenici del Poder Nuovo presso Monterufoli. [Pliocene Mollusca of Poder Nuovo.] *Boll. Soc. Mal. Ital.* vol. ii. pp. 14.

Tate, Prof. R., and J. F. Blake. The Yorkshire Lias. [See p. 35.]

Pp. 243–475 are palæontological. The Cephalopoda are described by Mr. Blake; 119 Tetrabranchiate and 45 Dibranchiate forms are recognized. The characters and subdivisions of *Ammonites* are dis-

cussed; and 113 species, distributed amongst the subgenera *Phylloceras*, *Lytoceras*, *Arietites*, *Ægoceras*, *Amaltheus*, *Harpoceras*, and *Stephanoceras*, are described, with 4 new species. Amongst the Dibranchiates 4 species of Teuthidæ are described, including the new *Beloteuthis Leckenbyi*, and 41 species of *Belemnites*, of which *Belemnites longiformis* is new. The Gasteropods are treated by Mr. Tate, 89 species being described, of which 14 are now first recorded as British, and 17 are new. The Lamellibranchiata, also treated by Mr. Tate, comprise 190 species, of which 12 are new. Amongst the Brachiopods, likewise by Mr. Tate, out of 24 species, *Thecidea belemnitica*, *Rhynchonella fodinalis*, and *R. capitulata* are described as new. The Insects (2 species) and the Crustacea (23 species) are dealt with by Mr. Blake. Among the latter 14 new species are described. The Annelids are described by Mr. Tate, and include 10 species, of which none are new. The Echinoderms are by Mr. Blake, and comprise 24 species, of which 3 are new. The Corals, by the same author, include only 4 previously recorded forms. Lastly, the Foraminifera, likewise by Mr. Blake, comprise 74 species, of which 9 are new. An Index of Synonyms (pp. i–xii) completes the work; and the fossils are illustrated by 19 plates. For the names of new forms, see Index of Species. H. A. N.

Terquem, O. Recherches sur les Foraminifères du Bajocien de la Moselle. [Bajocian Foraminifera of the Moselle.] *Bull. Soc. Géol. France*, ser. 3, t. iv. pp. 477–500, pls. xv.–xvii.

Of a large number of species described or enumerated, 20 are new; for their names, see Index of Species.

——. Observations sur l'étude des Foraminifères. [Observations on the Study of the Foraminifera.] *Bull. Soc. Géol. France*, ser. 3, t. iv. pp. 506–509, pl. xiii.

Contains various observations on the structure, form of the shell, and localities of Foraminifera. Deals specially with deformed specimens and their mode of production. H. A. N.

Terrigi, G. Sopra i Rizopodi fossili o foraminiferi dei terreni terziarii di Roma, studiati nelle sabbie gialle plioceniche. [Pliocene Rhizopods or Foraminifera of Rome.] *Boll. Soc. geogr. Ital.* vol. xii. pp. 12.

Thomson, Sir C. Wyville. Notice of New living Crinoids belonging to the Apiocrinidæ. *Journ. Linn. Soc.* vol. xiii. no. 66, pp. 47–55, woodcuts.

Indicates the relationship of the living forms to extinct genera.

Thomson, James. A New Genus of Rugose Corals from the Mountain Limestone of Scotland. *Rep. Brit. Assoc.* for 1875, *Sections*, p. 83.

Defines the genus *Dibunophyllum*.

Thomson, James, and **Prof. H. Alleyne Nicholson.** Contributions to the Study of the Chief Generic Types of Palæozoic Corals. *Annals*, ser. 4, vol. xvii. pp. 60–70, 123–128, 290–305, 451–462, & vol. xviii. pp. 98–73, pls. vi.–viii., xii., xiv.–xvii., xxi.–xxv., & vol. xviii. pls. i.–iii.

A continuation of a paper noticed in the Geological Record for 1875, p. 323. Describe and illustrate the structural characters of the following previously established genera:—*Cyathophyllum*, *Campophyllum*, *Diphyphyllum*, *Lophophyllum*, *Lithostrotion*, *Lonsdaleia*, *Clisiophyllum*, *Rhodophyllum*, and *Aspidophyllum*. The following types are described as being of generic or subgeneric value:—*Koninckophyllum*, *Acrophyllum*, and *Dibunophyllum*. H. A. N.

Trautschold, H. Ergänzung zur Fauna des russischen Jura. [Supplement to the Russian Jurassic Fauna.] Pp. 35; 6 pls. *St. Petersburg*.

Tribolet, M. de. Description de quelques espèces de crustacés décapodes du Valanginien, Neocomien et Urgonien de la Haute-Marne, du Jura, et des Alpes. [Decapod Crustacea of L. Cretaceous of E. France and Switzerland.] *Bull. Soc. Sci. Nat. Neuchâtel*, t. x. cah. 3, pp. 294–303, pl. i.

Describes and figures 8 species, of which *Callianassa spinosa*, *Hoploparia minima*, *Prosopon Renevieri*, and an indeterminate claw are new.

——. Note sur le genre *Posidomya*, et en particulier sur les *P. alpina*, Gras, et *P. ornata*, Quenstedt, suivie d'une liste des Posidonomyes jurassiques. [The Genus *Posidonomya*, especially *P. alpina* and *P. ornata*, with a list of the Jurassic species.] *Journ. Conchyl.* sér. 3, t. xvi. pp. 247–257.

Gives a history and description of the genus, remarking that most of the species have been hitherto mistaken for *Estheriæ*. Considers *P. Bronni* and *P. Buchi* distinct from *P. alpina*, but *P. ornata* identical with the last. C. P. G.

Tromelin, Gaston le G. de, and **Paul Lebesconte.** [Silurians of W. France.] *Compt. Rend. Assoc. Franç.* 1875. Title on p. 118.

Describes 88 species, of which the following are new:—*Asaphus armoricanus*, *Cytheropsis subtestis*, *Lyrodesma armoricana*, *Modiolopsis Cailliaudi*, *Orthoceras Chalmasi*, *Encrinites Andegavensis*, *Petraia? insolita*. Also 3 new species of plants, *Rysophycus armoricanus*, *Buthotrephis Sionensis*, and *Fucoides Bossei*. A list of species is added from Cabrières (Herault) and St. Beat (Haute-Garonne). W. H. D.

——. Présentation de Fossiles Paléozoiques du Département d'Ille-et-Vilaine et Note Additionnelle sur la Faune Silurienne de l'Ouest de la France. [Palæozoic Fossils of Ille-et-Vilaine and Silurian Fauna of W. France.] *Compt. Rend. Assoc. Franç.* for 1875, p. 683.

Describe *Dalmanites Dufouri* and 4 other new species (description published separately in 1875, see the GEOLOGICAL RECORD for 1875, p. 327). W. H. D.

Vasseur, M. G. Note sur un *Helix* du Gypse des Environs de Paris. [*Helix* found in the Gypsum near Paris.] *Bull. Soc. Géol. France*, sér. 3, t. iv. pp. 124–126.

Describes a *Helix* from the upper part of the gypseous series as nearly allied to, or identical with, *Helix Heberti*.

Vogdes, Lieut. A. W. A Monograph of American Trilobites. Part i. pp. 16. *Tampa, Florida.*

Wholly bibliographical.

Waagen, W. [Kutch Cephalopoda.] *Zeitsch. deutsch. geol. Ges.* Bd. xxviii. Heft 3, pp. 644–647.

Notices errata in his published work, the figures of *Ammonites Deshayesi* and *A. Martini* being interchanged, and the last plate has not succeeded. Some general results of researches are annexed. E. B. T.

Walcott, C. D. Preliminary Notice of the Discovery of the Remains of the Natatory and Branchial Appendages of Trilobites. 28*th Ann. Rep. New York State Mus.* pp. 89–92.

Describes appendages of *Ceraurus pleurexanthemus*, &c. from Trenton Limestone.

——. Descriptions of New Species of Fossils from the Trenton Limestone. 28*th Ann. Rep. New York State Mus.* pp. 93–97.

Describes *Conularia quadrata*, *Conchopeltis alternata*, *C. minnesotensis*, *Bathyurus longispinus*, *Asaphus Romingeri*, and *A. Wisconsensis*. *Conchopeltis* is a new genus of Gasteropod. W. H. D.

Walker, J. F. New British Brachiopoda. *Geol. Mag.* dec. ii. vol. iii. p. 574.

Notes the discovery of *Terebratula subsella*, Leymerie, not hitherto recognized in Britain, in the U. Corallian of Abbotsbury, Dorsetshire.

White, Prof. C. A. Invertebrate Palæontology of the Plateau Province, together with Notice of a few Species from Localities beyond its Limits in Colorado. Chap. iii. (pp. 74–135) of Prof. Powell's Report on Uinta Mts.: see p. 139.

A classified catalogue of all the invertebrate species, to the number of 262, is given; and of these 48 are briefly described as new, but without figures. Amongst the more important points brought out by the collections are:—(1) fresh and brackish water shells of a Tertiary facies are found as early as the Jurassic, and occur also abundantly in the Cretaceous; (2) the freshwater mollusks found in the lowest Tertiary beds are hardly distinguishable from living forms; and (3) several

undoubted marine genera have been identified from the Tertiary strata of Bijou Basin, 40 miles E. of Denver, Colorado, indicating the extension of open-sea marine deposits much further into the interior of the continent during the Tertiary period than had been suspected. The new species described are:—From the Carboniferous rocks, *Amplexus zaphrentiformis*, *Eupachycrinus platybasis*, *Archæocidaris cratis*, *Naticopsis remex*; from the Jurassic rocks, *Unio Stewardi*, *Neritina? Powelli*; from Cretaceous beds, 9 Lamellibranchs and 12 Gasteropods; from Tertiary beds, 8 Lamellibranchs and 13 Gasteropods (for names of these see Index of Species). H. A. N.

White, Prof. C. A. Description of New Species of Fossils from the Palæozoic Rocks of Iowa. *Proc. Ac. Nat. Sci. Philad.* ser. 3, vol. vi. pp. 27–34.

The new species described are:—*Stricklandinia castellana*, from the Niagara Limestone; *Chætetes Muscatinensis*, *Monticulipora monticula*, *Strobilocystites Calvini*, *Megistocrinus Farnsworthi*, *Paracyclas Sabini*, *Conularia molaris*, *Bellerophon Bowmani*, *Cyrtoceras dictyum*, and *Tentaculites Hoyti*, from the Devonian; and *Lophophyllum expansum*, *Allorisma Marionensis*, and *Euomphalus Springvalensis*, from the Sub-Carboniferous. The genus *Strobilocystites* is founded for the reception of a new Cystidean, which is remarkable as being the first representative of this order as yet identified with certainty from Devonian rocks. H. A. N.

Whiteaves, J. F. On some Invertebrates from the Coal-bearing Rocks of the Queen Charlotte Islands, collected by Mr. James Richardson in 1872. Mesozoic Fossils, vol. i. part 1, pp. 92, pls. i.–x., map & 9 engravings. *Geological Survey of Canada.* 8vo. *Montreal.*

Gives a preliminary consideration of the deposits in which the fossils occur, and the general nature of their organic remains. Describes 21 species of Cephalopoda, including 8 new *Ammonites*, and some undetermined species of *Ammonites*, *Belemnites*, and *Hamites*. 7 Gasteropods are determined, *Amauropsis tenuistriata* and *Pleurotomaria Skidegatensis* being new. 22 Lamellibranchs are recognized, many in too imperfect a state for specific determination; but 7 are new. Notices two undeterminable species of *Terebratula*, and a coral, likewise undeterminable. Considers the palæontological relations of the Cretaceous rocks of Vancouver, and arrives at the conclusion that the coal-bearing rocks of Queen Charlotte Islands, which have yielded the fossils described, can hardly be older than the Upper Jurassic or younger than the Middle Cretaceous. For the names of the new Cephalopods and Lamellibranchs, see Index of Species. H. A. N.

Whitfield, R. P. Descriptions of New Species of Fossils. Pp. 142–145, pls. i., ii., *of Capt. W. Ludlow's "Report of a Reconnaissance ...."* (see p. 137).

11 species are described and figured, of which 10 are new:—*Crepicephalus* (*Loganellus*) *Montanensis* and *Arionellus tripunctatus*, from Potsdam Sandstone; *Pinna Ludlovi*, from Coal Measures; *Gryphœa planoconvexa*, *Gervillea sparsalirata*, and *Myalina*? (*Gervillea*) *perplana*, from Jurassic (Bridger Mountains); and *Tapes Montanensis*, *Mactra maia*, *Sanguinolaria oblata*, and *Thracia* (*Corimya*) *Grinnelli*, from Cretaceous rocks. H. A. N.

Woods, Rev. J. E. T. On Some Tertiary Fossils from Table Cape, Tas. *Monthly Notices R. Soc. Tasm.* for 1875, pp. 13–26; 3 plates.

Gives an outline of the geology and a list of fossils of the deposit. Describes as new 9 Gasteropods and 5 Lamellibranchs (see Index of Species). R. E., Jun.

——. On the Genus *Fenestella*. *Monthly Notices R. Soc. Tasm.* for 1875, pp. 46–50.

Remarks that in some species of Tasmanian Devonian *Fenestellæ* the cross bars or dissepiments are sparsely celluliferous. No Australian species occur in British rocks. Gives descriptions of several previously known species. R. E., Jun.

Woodward, Henry. On some New Macrurous Crustacea from the Kimmeridge Clay of the Sub-Wealden Boring, Sussex, and from Boulogne-sur-Mer. *Quart. Journ. Geol. Soc.* vol. xxxii. pp. 47–50, pl. vi.

The name of *Callianassa isochela* is proposed for a Crustacean of the family of the Thalassinidæ, from the Sub-Wealden boring. The name of *M. Peytoni* is further given to a new *Mecochirus*, which was found both in the boring and in the Kimmeridge Clay of Boulogne. Both species are described and figured; and an analysis of the fossil species belonging to these genera is appended. H. A. N.

——. On a New Fossil Crab from the Tertiary of New Zealand, collected by Dr. Hector. *Quart. Journ. Geol. Soc.* vol. xxxii. pp. 51–53, pl. vii.

The name of *Harpactocarcinus tumidus* is given to a new crab from the "Ototara series" on the N.W. coast of the South Island (see **Hector**, p. 162). H. A. N.

——. On the Discovery of a Fossil Scorpion in the British Coal-Measures. *Quart. Journ. Geol. Soc.* vol. xxxii. pp. 57–59, pl. viii.

Analyzes the previously known remains of Palæozoic Scorpionidæ, and records the occurrence in England and Scotland of examples of the genus *Eoscorpius*. The remains consist of the body-segments and one of the palpi; and they are referred to a new species, *E. Anglicus*. H. A. N.

——. On a remarkable fossil Orthopterous Insect from the Coal-

Measures of Scotland. *Quart. Journ. Geol. Soc.* vol. xxxii. pp. 60–64, pl. ix.

Describes a well-preserved large insect, the two best-preserved wings being 2¾ inches in length, and 1 inch and 1¼ inch respectively in width. It shows the "shrill-vein" so characteristic of many of the Orthoptera, and presents a strong likeness to *Corydalis* (*Gryllacris*) *Brongniarti*, from the Coal Measures of Coalbrook Dale. From the dilatation of the prothorax it is placed in the neighbourhood of the Mantidæ. It is named *Lithomantis carbonarius*, and compared with the living *Blepharis domina*, from the White Nile. A list of Palæozoic Insecta, Myriapoda, and Arachnida is appended. H. A. N.

Young, John. Notes on *Archæocidaris*, a Carboniferous Echinoderm with overlapping plates. *Proc. Nat. Hist. Soc. Glasg.* vol. ii. pt. ii. pp. 225–231.

Shows that the ambulacral plates of *Archæocidaris* were imbricated, and that certain of the interambulacral plates were furnished with bevelled edges in such a manner as to communicate some flexibility to the entire test. The provisional name of *A. Scotica* is proposed for certain teeth which differ materially from those of *A. Urii*. The specimens described are from the L. Carboniferous of Campsie. H. A. N.

Young, Prof. John, and **John Young.** New Species of *Glauconome* from Carboniferous Limestone Strata of the West of Scotland. *Proc. Nat. Hist. Soc. Glasg.* vol. ii. pt. ii. pp. 325–335, pls. ii.–iv.

The question as to whether these are truly Polyzoa is reserved for future discussion. The species described as new are *G. marginalis*, *G. elegans*, *G. aspera*, *G. flexicarinata*, *G. retroflexa*, and *G. laxa*. The subgenus *Diplopora* is proposed for *G. marginalis*, on account of its possessing a minute aperture below the true cell-mouth; and the name *Acanthopora* is proposed as a subgeneric designation for the previously described *G. stellipora*, from its possession of 8 radial spines guarding the cell-mouth. H. A. N.

Zittel, Prof. Karl A. Ueber einige fossile Radiolarien aus der norddeutschen Kreide. [Fossil Radiolaria from N. German Chalk.] *Zeitsch. deutsch. geol. Ges.* Bd. xxviii. pp. 75–86, pl. ii.

Describes a number of Radiolarians from the Chalk of Germany belonging to the genera *Dictyomitra*, *Dictyocha*, *Cenosphæra*, and *Stylodictya*. The genus *Dictyomitra* is founded and defined for part of the forms referred by Ehrenberg to *Eucyrtidium*. 6 new species are described (see Index of Species). H. A. N.

——. [Fossil Sponges.] *Zeitsch. deutsch. geol. Ges.* Bd. xxviii. Heft 3, pp. 631, 632.

Verbal note on some Petrospongiæ which belong to the Hexactinellidæ and Lithistidæ, and in which the siliceous fibre has been partly replaced

by calcite (pseudomorph), also on others which are Calcispongiæ fibrosæ. E. B. T.

Zittel, Prof. Karl A. Ueber *Cœloptychium*. Ein Beitrag zur Kenntniss der Organisation fossiler Spongien. [*Cœloptychium*. A Contribution to our Knowledge of the Organization of Fossil Sponges.] *Abh. k. bay. Ak. Wiss.* Bd. xii. Abth. iii. pp. 80 ; 7 pls.

A memoir on the fossil sponges described originally by Goldfuss under the name of *Cœloptychium*. Shows that these sponges properly belong to the Hexactinellidæ, and gives an account of the structure of the skeleton and flesh-spicules. Ten species of the genus are fully described, of which *C. Seebachi* is new. The genus is defined as comprising pedunculate sponges, generally resembling a table, umbrella, or mushroom in shape, but sometimes widely infundibuliform. The wall is thin, folded externally in a meandrine manner by strong, often branched, radial folds, which are only visible inferiorly, being covered superiorly and on the sides by porous plates. There is a central body-cavity, subdivided, by the folding of the wall, into radially arranged canal-like side-chambers. The peduncle is hollow. The skeleton is formed of sexradiate spicules of silica united into a coherent lattice-work, and of numerous isolated flesh-spicules of varied shapes. H. A. N.

——. [Fossil Sponges and Radiolaria.] *N. Jahrb.* Heft iii. pp. 286–289.

Preliminary notice of recent work on the fossil Hexactinellidæ, with special reference to the genus *Cœloptychium*, Goldf. In the residue obtained by treating the sponges with acid several Radiolarians new to Cretaceous rocks have been discovered. F. W. R.

Zittel, Prof. Karl, and **Prof. W. Schimper.** Handbuch der Palæontologie. [Handbook of Palæontology.] Bd. i. 1 Lief. pp. 128 ; 56 engravings. 8vo.

The zoological portion is undertaken by Prof. Zittel, the botanical part by Prof. Schimper. Pp. 1–52 are occupied with the consideration of a number of general questions, such as the scope of palæontology, the laws of fossilization, the relations of palæontology to zoology and botany, the mode of occurrence and succession of fossils in the stratified deposits, the history of the science, &c. The remainder is occupied with the distribution in time of the Protozoa (excluding the Spongida, in accordance with the views of Haeckel). The fossil Foraminifera and Radiolaria are fully treated of, all the genera being defined shortly, and many original figures given. H. A. N.

See also :—

Brauns, Dr. D. Senonian Shells, Saxony : p. 51.

Dawson, Dr. J. W. Eozoön, Canada : p. 131.

Fuchs, Th. Tertiary Shells, Malta : p. 65.

Hoernes, Dr. R. Tertiary Shells, Turkey : p. 75.

Jukes-Browne, A. J. Palæontology, under **Penning** : p. 328.

Linnarsson, G. Swedish Graptolites : p. 87.

Nicholson, Prof. H. A. Graptolites : p. 99.

Nordenskiold, Prof. A. E. Spitzbergen Fossils : p. 125.

Schlüter, Dr. C. N. German Cretaceous Cephalopods : p. 108.

Stefani, C. de. Italian Liassic Shells : p. 111.

Wallace, A. R. Antiquity of Insects and Land Mollusca : p. 267.

Catalogue of Western Scottish Fossils : p. 44.

3. *PLANTS.*

Boulay, N. Le terrain houiller du Nord de la France et ses Végétaux fossiles. (See p. 50.)

The new genus *Rhytidodendron* is separated from *Lepidodendron* by its very small elliptic leaf-bases. Species of *Calamocladus*, *Sphenopteris*, *Nephropteris*, *Pecopteris*, *Alethopteris*, and *Sigillaria* are noticed. W. C.

Butterworth, John. Coal Plants. (Ovenden Naturalists' Society.) *Naturalist*, ser. 2, vol. i. no. 10, pp. 151–153.

Description of a Calamite with the bark attached, and notes on the structure of other coal-plants.

——. Rambles after Fossil Plants. *Sci. Goss.* No. 143, pp. 243, 244; 4 cuts.

Description of a nodule, from the Coal Measures at Halifax, full of macrospores.

D[ana], Prof. J. D. Age of Angiospermous Plants referred to the Cretaceous. *Amer. Journ.* ser. 3, vol. xi. pp. 497, 498.

Duncan, Prof. P. M. On some Unicellular Algæ parasitic within Silurian and Tertiary Corals, with a Notice of their Presence in *Calceola sandalina* and other Fossils. *Quart. Journ. Geol. Soc.* vol. xxxii. pp. 205–210, pl. xvi.

The alga is named *Palæachlya perforans*; and the many forms are regarded as one species, varying with the nature of the nidus.

Engelhardt, Hermann. Tertiärpflanzen aus dem Leitmeritzen Mittelgebirge..... *Nova Acta Ac. Cæs. Leop.-Car.* Bd. xxxviii. no. 4, pp. 343–417, pls. xvi.–xxvii.

Fagg, Hon. T. J. C., and **Dr. G. Engelmann.** Notes on a Fragment of Coniferous Wood in Chert from the Oolitic Onondaga Limestone (Devonian) of Louisiana, Pike County. *Proc. Ac. Sci. St. Louis*, vol. iii. pp. cci, ccii.

Feistmantel, Dr. O. Die Versteinerungen der böhmischen Kohlengebirgsablagerungen. [Fossils of Bohemian Coal-Measures.] *Palæontographica*, Bd. xxiii. Lief. 7–9, pp. 223–316, tab. 50–67.

[See GEOLOGICAL RECORD for 1874, p. 334, and for 1875, p. 336.]

Continues with the *Sigillariæ* and their distribution in Bohemia, Silesia, &c.; 20 species are noted, excluding synonyms; under *S. tesselata* are included 6 other species of Brongniart, one of Corda, and *Stigmaria conferta* (Corda). Of *Sigillariostrobus* 4 species are cited: the first cone is not interpreted in the usual way, but the macrospores [Schimper, &c.] are held to be sporangia, Gœppert's *Carpolithes coniformis* being the same detached; the characteristics of this cone are thus given—"surface of the bracts beset all over with sporangia;" that of *Lepidostrobus*—"each bract has a single oblong sporangium." *Stigmaria* is not accepted as the root of *Sigillaria*. In an appendix are notes on various families. *Nœggerathiostrobus bohemicus*, a gymnosperm cone, is accounted the fruit of *Nœggerathia foliosa*; these fossils occur in the same bed at Radnitz and Rakonitz. Remains of Antholithes, since they occur in the same bed with *Cordaites borassifolia*, are held to be its inflorescence; thus *A. Pitcairniæ* is renamed *Cordaitanthus communis*. *Araucarites* (*Araucarioxylon*) *Schrollianus* occurs in red Permian sandstones in Bohemia. Among ferns, 27 species of *Sphenopteris*, 5 of *Hymenophyllites*, 5 of *Schizopteris*, 13 of *Neuropteris*, 5 of *Cyclopteris*, including *Adiantites*, &c., occur in Bohemia; only a few are here figured and described. A list of fossils in each locality, alphabetically arranged, closes the memoir. E. B. T.

Feistmantel, Dr. O. Palæontologia Indica. Series xi. 1. Jurassic (Oolitic) Flora of Kach. *Mem. Geol. Surv. Ind.* Pp. 80; 12 plates.

Consists of:—1. General table of the plants from the Jurassic strata of Kach. 2. Description of the plants. 3. Comparative table of the plants from Kach, and of allied forms in other Indian formations and in foreign countries. 4. The fossil localities in Kach, enumeration of the fossils found at each, and their comparison with the whole. 5. The flora of each locality in Kach systematically discussed and compared with the distribution of the same genera in other strata. 6. General considerations about the flora from Kach. 7. Comparison of the flora of Kach with that of the Rajmahal group, both formerly supposed of the same age. 8. Explanation of some fossil plants previously described from Kach. 9. Comparison of the fossil flora of Kach with European Oolitic floras. 10. Summary of results. The author considers these plants to be of L. Oolite age, as 8 forms are identical with the L. Oolite flora of Scarborough. In the appendix a few specimens are described from Nurha which come from a lower horizon. Among the figures and descriptions are noticed 12 new species, besides 3 varieties of *Ptilophyllum cutchense*, Morris (see Index of Species). The plants are ferns, Cycadaceæ, and Coniferæ. R. B. N.

——. Contributions towards the Knowledge of the Fossil Flora

in India. (1) On some Fossil Plants from the Damuda Series in the Raniganj Coalfield, collected by Mr. J. Wood-Mason. *Journ. As. Soc. Bengal*, vol. xlv. pt. ii. pp. 329–382, plates xv.–xxi.

The specimens represent 14 species, 2 of Equisetaceæ and 12 of Filices. The following new species are described:—*Schizoneura Gondwanensis*, *Sphenopteris polymorpha*, *Alethopteris phegopteroides*, *Palæovittaria* (n. gen.) *Kurzi*, *Belemnopteris* (n. gen.) *Wood-Masoniana*, *Gangamopteris Whittiana*, *Glossopteris communis*, *Lagenopteris polyphylla*, *Actinopteris Bengalensis*. The character of the whole flora is Mesozoic. Mention is made of the other known plants from the Raniganj field. R. B. N.

Geinitz, Dr. H. B. Ueber Rhætische Pflanzen- und Thierreste in den argentinischen Provinzen La Rioja, San Juan und Mendoza. [Rhætic Fossils, Argentine Republic.] *Palæontographica*, Suppl. iii. Lief. 2, pp. 14; 2 pls.

The fossils, mostly plants, come from four localities:—1, bituminous shales, &c., Province Mendoza; 2, carbonaceous sandy shales, Province San Juan; 3, black shales of Cuesta Colorada, Province la Rioja; 3, grey shale of Las Gredas, same district. All are held to be probably Rhætic. 9 new species are described out of a total of 15: see Index of Species. A fish also described. E. B. T.

Geyler, Dr. H. Th. Ueber fossile Pflanzen aus den obertertiären Ablagerungen Siciliens. [U. Tertiary Fossil Plants, Sicily.] *Palæontographica*, Bd. xxiii. Lief. 9, pp. 317–328, pls. 68, 69.

The plants come from the neighbourhood of Girgenti. The richest beds are those of the sulphur-bearing gypsum formation; their age corresponds to that of the Œningen or Messinian stage, since there are common to both 2 species of *Libellula* and 11 out of the 15 plants now determined. The new species are *Palmacites Stœhrianus* and *Alnus Nocitonis*. E. B. T.

Grote, A. R., and **W. H. Pitt.** New Fucoid from the Water-lime Group (Lower Helderberg) of Western New York. *Bull. Buff. Soc. Nat. Sci.* vol. iii. p. 88.

Describes the new species *Buthotrephis Lesquereuxi*.

Heer, Prof. Oswald. Ueber permische Pflanzen von Fünfkirchen in Ungarn. [Permian Plants, Hungary.] *Mitth. Jahrb. k. ung. geol. Anst.* Bd. v. Heft 1, pp. 1–18, tab. xxi.–xxiv.

11 species are recorded from brown sandstones and shales, which belong to the U. Permian (equivalent to Zechstein), from the neigh-

bourhood of Fünfkirchen. The plants are found in the shales; the sandstones contain large stems of *Araucarites*. The beds above are Bunter, beginning with a quartz-conglomerate (Verrucano), followed by red sandstones and representatives of Muschelkalk, &c. Besides *Schizolepis permensis* (genus hitherto only found in Rhætics), 7 other new species are described (see Index of Species). E. B. T.

Heer, Prof. Oswald. Beiträge zur fossilen Flora Spitzbergens, gegründet auf die Sammlungen der Schwedischen Expedition vom Jahre 1872 auf 1873. Mit einem Anhang: Uebersicht der Geologie des Eisfjordes und des Bellsundes von **Prof. A. E. Nordenskiöld.** [Contribution to the Fossil Flora of Spitzbergen, founded on the Collections of the Swedish Expedition in 1872, 1873. With a Sketch of the Geology of the Ice Fjord and the Bell Sound, by **Prof. A. E. Nordenskiöld** (see p. 125).] *K. Svenska Vet.-Akad. Handl.* Bd. 14, No. 5, pp. 1–141, pls. i.–xxxii.

Descriptions of Carboniferous plants of Robert Valley in Recherche Bay; of the Jurassic plants of Cape Boheman; of the Cretaceous plants of the citadel at Cape Staratschin; of the Miocene plants of Cape Lyell, the Scott glacier, and Cape Heer. Of the 26 Carboniferous plants 13 species are new (see Index of Species). The Carboniferous schist of Robert Valley is analogous to the Mid. Carboniferous of Europe; and at Spitzbergen thick coal seams may probably be found. The strata of Cape Boheman belong to the middle brown Jura. Of the 32 plants 10 are found also at other places, 1 in Upper Italy, 1 in Persia, 1 at Orenburg, and 7 in E. Siberia; so that not only the marine fauna but also the terrestrial flora of the Jurassic period had a wide distribution. The large number of Cycads in the Spitzbergen Jura flora gives to this high arctic island an almost tropical aspect. No difference then existed as to climates in different latitudes. The richest locality of Miocene plants is Cape Lyell; and the author thinks these plants the most beautiful yet discovered within the arctic zone. The 3 localities have supplied 71 species of plants. Of these, 25 have not been hitherto described. The most common are *Sequoia Langsdorfii, Acer arcticum, Taxodium, Glyptostrobus, Alisma macrophyllum, Platanus aceroides,* and *Populus arctica.* In all 179 species are known from the Spitzbergen Miocene. E. E.

——. Beiträge zur Jura-Flora Ost-Sibiriens und des Amurlandes, *Mém. Ac. Imp. Sci. St. Pétersb.* t. xxii.

This flora is rich in *Salisburiæ* and allied Taxineous plants, together with true Coniferæ, and some screw-pines.

——. Flora Fossilis Arctica. Vol. iv. 65 plates.

Contains three memoirs:—1. Beiträge zur fossilen Flora Spitzbergens; 2. Beiträge zur Jura-Flora Ost-Sibiriens (both already noticed); and 3. Ueber die Pflanzen-Versteinerungen von Andö in Norwegen [On the Fossil Plants at Andö in Norway].

Heer, Prof. Oswald. Ueber fossile Früchte der Oase Chargeh. [Fossil Fruits from the Chargeh Oasis.] *Denkschr. schweiz. Nat. Ges.* vol. xxvii.

These fossils are named *Diospyros Schweinfurthii* and *Royena desertorum*, and referred to the U. Cretaceous.

Hull, Prof. E. Observations on the Discovery, by Count Abbot Castracane, of Diatomaceæ in Coal from Lancashire and other places. *Rep. Brit. Assoc.* for 1875, *Sections*, p. 74. See **Castracane**, in the GEOLOGICAL RECORD for 1874, p. 331, and for 1875, p. 335; and *Geol. Mag.* 1875, pp. 414–419.

Johnson, M. Hawkins. On Silicified Structure in Pyritized Wood. *Journ. Quek. Club*, vol. iv. pp. 159, 160.

By treating sections of pyritized wood from the London Clay with strong nitric acid the woody structure was made visible. Thin slices of silicified wood may be stained with acetate of rosaniline, the cell-walls being the part which take the stain. Flints, stained in the same way, show the structure of the organism coloured. E. T. N.

Lesquereux, [Prof.] L. A review of the Fossil Flora of North America. *Bull. U. S. Geol. Surv. Terr.* ser. 2, no. 5, pp. 233–248.

The graphite in the primitive rocks is probably due to diatoms and desmids. Fucoids appear in the L. Silurian, and land plants in the Mid. Silurian (Cincinnati group). Lycopodiaceæ come in at the base of the Devonian and *Araucariæ* in the Chemung period. Ferns (Neuropteridæ) range upwards from the Devonian into the Subcarboniferous. Of Lycopodiaceæ, *Lepidodendron*, the most ancient, disappears first; *Sigillaria* is newer and lasts longer, occurring in the L. Permian in Europe; *Calamites* ranges from U. Devonian to Permian. No Triassic flora is known in N. America, the Richmond coal being L. Jurassic or Rhætic. Its flora consists of cycads and conifers, with ferns and *Equiseta*. Jurassic plants are unknown in N. America. The L. Cretaceous beds (Dakota group) abound in dicotyledonous plants; cycads, ferns, and conifers being scantily represented. The L. Lignitic flora has no species identical with, and few related to, any Cretaceous species. It is marked by palms and southern plants, as fig, myrtle, and magnolia. The Evanston (U. Eocene or L. Miocene) is intermediate in its flora to the L. Lignitic or Eocene and the U. Lignitic or Carbon group (Mid. Miocene). The last contains a few L. Lignitic species, many of those of the European and Arctic Miocene, and several hardly separable from their recent descendants. The Green River group or U. Miocene is still nearer in its flora to the present, and is of colder climate than the foregoing. The Pliocene, Glacial, and Terrace deposits are not yet well known; their flora approximates more and more to the present. The American flora at each epoch seems to have been slightly in advance of the European. W. H. D.

Lesquereux, Prof. L. On some new species of Fossil Plants from the Lignitic formations. *Bull. U. S. Geol. Surv. Terr.* ser. 2, no. 5, pp. 363–389.

Describes the following new species from the Bitter Creek series, Wyoming—*Lemna*? *bullata*, *Fucus lignitum*, *Selaginella*? *falcata*, *Sequoia biformis*, *Widdringtonia complanata*, *Laurus* (*Persea*) *præstans*, *Viburnum rotundifolium*, *Trapa*? *microphylla*, *Rhus membranacea*, *Quercus competens*, and *Dryophyllum crenatum*. In an appendix "On the evidence afforded by the fossil plants of Point of Rocks in regard to the Geological age of the Formation" this flora is compared with the Miocene, Eocene, and Cretaceous. The balance of evidence is slightly to the Miocene; but many species show affinity to the Eocene, and some to the Cretaceous. 32 more new species, from various localities, are described, besides several previously known: see Index of Species. W. H. D.

——. New Species of Fossil Plants from the Cretaceous formation of the Dakota group. *Bull. U. S. Geol. Surv. Terr.* ser. 2, no. 5, pp. 391–400. Noticed in *Geogr. Mag.* vol. iii. pp. 152–155.

Descriptions of the following new species—*Sequoia condita*, *Inolepis*?, *Myrica cretacea*, *Dryophyllum* (*Quercus*) *latifolium*, *D. salicifolium*, *Populus aristolochioides*, *Ficus distorta*, *Laurus proteæfolia*, *Andromeda acuminata*, *Ilex strangulata*, *Aristolochites*, *Aralia tripartita*, *A. Saportana*, *A. concreta*, *A. semiorbiculata*, *A. Towneri*, *Hedera Schimperi*, *Ampelophyllum* (gen. nov.) *firmum*, *A. attenuatum*, *Cissites Heerii*, *C. acuminatus*, *Credneria*? *microphylla*, *Protophyllum*? *trilobatum*, and *Menispermites ovalis*. Some of these, and other already known species from this locality, are described at greater length, and figured in *Ann. Rep. U. S. Geol. Surv. Terr.* for 1874, pp. 316–365. See below. W. H. D.

——. *Ann. Rep. U. S. Geol. Surv. Territories*, for 1874 (see **Hayden**, p. 134).

On the Tertiary Flora of the North American Lignitic, considered as Evidence of the Age of the Formation, pp. 275–315. The review of Palæozoic and Mesozoic flora is similar to that in the *Bulletin* (see above). The discussion of the Lignitic flora is more extended. The description of many of the species is repeated, with the addition of *Pistia corrugata* and *Ottelia Americana*, both new, from Point of Rocks. Concludes, but doubtfully, that the Lignitic is Eocene.

A Review of the Cretaceous Flora of North America, pp. 316–365, 8 plates. Deals chiefly with the flora of the Dakota group, remarking on the affinities of the species with those of other Cretaceous deposits (Greenland and Europe), and describing, amongst others, the following new species—*Daphnogene cretacea*, *Hedera platanoidea*, *Menispermites populifolius*, *M. cyclophyllus*, *Sterculia linearifoba*, and *Protophyllum Crednerioides*. W. H. D.

Ludwig, Rudolf. Fossile Pflanzen aus der Steinkohlenformation im Lande der Don'schen Kosaken. [Carboniferous Plants from

the Don.] *Bull. Soc. Imp. Nat. Mosc.* t. i. p. 7, pl. i. See GEOLOGICAL RECORD for 1874, p. 81.

Describes 25 species, of which the following are new—*Neuropteris orientalis, N. desertæ, Callipteris brevifolia*, and *C. longifolia*.

Malaise, C. La paléontologie végétale de la Belgique. [Vegetable Palæontology of Belgium.] *Bull. Soc. Linn. Bruxelles*, t. v. pp. 41–46, 57–63, 69–72, 101–107, 118–121.

A review of the fossil plants of Belgium, with a revised catalogue of the species.

Meyn, L. Ueber das verkieselte Coniferenholz des nord-deutschen Diluviums und dessen Ursprung. [Silicified Coniferous Wood, &c.] *Zeitsch. deutsch. geol. Ges.* Bd. xxviii. Heft 2, pp. 199–202.

A coniferous fossil wood occurring in N. German Drift, silicified so that the silica has filled the interior of the tissue only, while the cell-walls are not preserved. It has been probably derived from Miocene beds and redeposited; for a silicified tree-trunk in similar condition was found in a lignite-formation at Malliss, in Mecklenburg. E. B. T.

Nathorst, A. G. Bidrag till Sveriges fossile flora. [Contribution to the Fossil Flora of Sweden.] *K. Svenska Vet.-Akad. Handl.* Bd. 14, No. 3, pp. 1–82, pls. i.–xvi.

Gives a complete description of fossil plants from the Rhætic formation at Pålsjö, Scania. 26 species are described and figured, of which 12 are new (see Index of Species). Compared with foreign localities for Rhætic plants, Pålsjö is one of the richest; and the plants are very well preserved. The most common species are *Nilssonia polymorpha*, *Dictyophyllum Nilssoni*, and *D. Muensteri*. In relation to the Rhætic floras in Franconia, the Pålsjö flora is situated between that at Theta and the other Franconian localities. E. E.

——. Anmärkningar om den fossila floren vid Bjuf i Skåne. [Fossil Flora at Bjuf, in Scania.] *Œfv. k. Vet.-Akad. Förh.* No. 1, pp. 29–41.

An account of plants found at the coal-mine of Bjuf, in Scania. Of 15 species the following occur in foreign localities also:—*Tæniopteris tenuinervis*, Braun; *Otozamites ? Blasii*, Braun; *Asplenites Ottonis*, Gp.; *Nilssonia acuminata*, Gp.; and *Pterophyllum acuminatum*, Morris. The fossils are Rhætic, but the beds are a little older than those at Pålsjö. E. E.

——. Om frontidens växter. [The Plants of Former Times.] *Botaniska Notiser*, 1875, pp. 116–123, 180–189; 1876, pp. 25–28, 60, 61.

Notices of recent memoirs and opinions on *Asterophyllites*, *Calamites*, and *Lepidodendron*.

Newberry, Prof. J. S. Description of the Carboniferous and Triassic

Fossils collected on the San Juan Exploring Expedition (in 1859). Pp. 137–148, pls. iii.–viii. of the Report noted on p. 138.

The botanical part deals with a number of plant-remains obtained from the Triassic rocks of the region examined, 11 new species being described and figured: see Index of Species. H. A. N.

O'Meara, Rev. Eugene. Diatomaceous forms, with a new species of *Colletonema*, from subfossil material found along with remains of *Megaceros*. *Quart. Journ. Micr. Sci.* vol. xvi. pp. 416, 417.

Many diatoms obtained from subfossil material found at Ballybetagh, under the bed containing the bones of the extinct Irish Elk, are referred to known genera and species; but one remarkable form is believed to be new, and is called *Colletonema Hibernicum*. E. T. N.

Peruzzi, G. Descrizione di alcune Filliti della Lignite del Casino. [Fossil Leaves from the Lignite of Casino.] *N. Giorn. Bot. Ital.* vol. viii. pp. 63–77,

28 species are described, of which one, a *Sequoia*, is supposed to be new.

Renault, B. Recherches sur la Fructification de quelques Végétaux provenant des gisements silicifiés d'Autun et de Saint Etienne. [Fruit-cones, &c. from Coal Measures.] *Ann. Sci. Nat.* sér. 6, *Botan.* t. 3, pp. 29, pl. 4.

Silicification has resulted in the preservation of minute structure. Some reniform fruit-capsules are referred to *Zygopteris*; and it is probable that the fertile frond *Androstachys* is a part of this plant, and *Schizopteris pinnata* the barren frond of the same. The relation of the fruit-cones, *Bruckmannia*, *Volkmannia*, and *Macrostachya*, is discussed: *Bruckmannia Grand-Euryi*, n. sp., has 36 bracts in the verticil, and verticils of 18 sporangiophores; *B. Decaisnei* has 24 sterile bracts and 12 sporangiophores in the respective verticils. The anatomy of *Volkmannia gracilis* is here made known. A portion of *Macrostachya*, enclosing macrospores, is held to be the cone of *Equisetites infundibuliformis*. A second form of *Volkmannia* is regarded as the fruit of *Asterophyllites equisetiformis*. E. B. T.

Saporta, Count G. de. Les associations végétales fossiles dans leurs rapports avec la nature physique des dépôts qui les renferment. *Rev. Sci.* t. xi. pp. 33–38, 64–68.

In judging of the vegetation of an epoch the influence of habitat should not be disregarded; *e. g.* the flora of a bituminous shale formed in marshy or humid places will show different genera from deposits on higher ground in same epoch. Again, there is a likeness in the schist-floras of the Rhætic in Scania and Franconia, the Oolite of Yorkshire and Spitzbergen, the Wealden of N. Germany, &c. Among floras are those of strata deposited in quiet lakes, rivers, estuaries, peaty lagunes, thermal sources, and eruptive tuffs, these last giving the

flora of the uplands. The plants found in these different stations, especially in the Tertiary epoch, are sketched out. E. B. T.

Saporta, Count G. de, and A. F. Marion. Recherches sur les Végétaux fossiles de Meximieux (Ain). [Fossil Plants of Meximieux]. *Arch. Mus. Lyon*, t. i. livr. 5, 6, pp. 185–335, pls. 28–38, continued: see GEOLOGICAL RECORD for 1875, p. 339.

Traces the development of the said Pliocene flora by the decline and elimination of earlier Tertiary types, the Eocene forms retreating first (their representatives being now found in Africa, S. Asia, &c.). Those taking their places spread out laterally to America and Japan, causing a uniformity in the N. temperate flora of that time. In the Pliocene epoch this was broken up; the delicate species succumbed first, the gradual retreat southwards of some types being traced from Lyons to the Val d'Arno, &c. In the description of species, where the Pliocene form seems not specifically distinct from the modern one, it is written thus: *Acer lætum*, Mey. (*pliocenicum*), which is considered as the parent form of 3 or 4 varieties now living in Asia. In all 32 species, of which 12 are living, are adduced. The new species are *Daphne princeps*, *Diospyros protolotus*, *Anona Lorteti*, *Buxus pliocenica*, *Punica Planchoni* (formerly placed as a variety of the recent pomegranate). [*Torreya bilinica*, n. sp., is established incidentally on an example from Bilin, termed *Sequoia Langsdorfii* by Ettingshausen;] *Torreya nucifera*, var. *brevifolia* is a variety of the form living in Japan. *Juglans minor* was formerly termed *Carya minor*. E. B. T.

Schenk, Prof. Ueber die Fruchtstände der fossilen Equisetineen. [Fructification of Fossil Equisetaceæ.] I. Annularia. *Botanische Zeitung*, pp. 530–539. II. Sphenophyllum, pp. 626–634.

A review of the literature relating to these fruits, and an estimate of the views entertained regarding them.

Schmalhausen, J. Die Pflanzenreste aus der Ursastufe im Flussgeschiebe des Ogur in Ost-Sibirien. [Plants of the Ursa Stage found in Pebbles in the Ogur, E. Siberia.] *Bull. Ac. Imp. St. Pétersb.* vol. xxii. pp. 277–291, pls. i.–iv.

In coarse sandstone-pebbles in the Ogur, a tributary of the Yenesei, a number of fossils have been found, among them *Knorria imbricata* and *Cyclostigma Kiltorkense*, supplying additional information as to these species; and 4 new species—*Filicites ogurensis*, *Bergeria alternans*, *B. regularis*, and *Lepidostrobus gracilis*. W. C.

——. Vorläufiger Bericht über die Resultate mikroskopischer Untersuchungen der Futterreste eines sibirischen *Rhinoceros antiquitatis* seu *tichorhinus*. [Food-remains of a Siberian *Rhinoceros tichorhinus*.] *Bull. Ac. Imp. Sci. St. Pétersb.* t. xxii. pp. 291–295.

Enumerates various plant-remains found in hollows in the teeth, mostly monocotyledons, but some dicotyledons of recent arctic and subarctic species.

Sterzel, Dr. J. T. Tæniopterideen aus dem Rothliegenden von Chemnitz-Hilbersdorf. [Tæniopteridæ from the Rothliegende of Chemnitz and Hilbersdorf.] *N. Jahrb.* Heft iv. pp. 369–385, plate and woodcut.

Tate, Prof. Ralph. The Yorkshire Lias. (See p. 35.)

Pp. 474, 475 are devoted to a description of the plant-remains. 7 forms are recognized, of which 2 are undetermined, and 2 (*Nullipo-rites furcillatus* and *Chordophyllites cicatricosus*) are described as new and referred to the Algæ. H. A. N.

Tupper, J. L. The Fossil. *Rep. Rugby School Nat. Hist. Soc.* for 1875, pp. 50–56, pls. 1 (heliotype), 10 (key to pl. 1). Read before Geol. Soc.

Describes a unique specimen, ? *Cruziana semiplicata*, Salter, obtained from a workman at Bangor.

Vine, G. R. On the Discovery of Macrospores in Carboniferous Sandstone. *Sci. Goss.* No. 143, pp. 247, 248.

In a sandstone above the Parkgate and Silkstone seams at Wincobank Hill, Sheffield, there are many drifted calamite-stems; but Lepidoden-droid plants are scarce, and the macrospores only lately found. W. W.

Weiss, [Dr. C. E.] [On some Permian Plants.] *Zeitsch. deutsch. geol. Ges.* Bd. xxviii. Heft 3, pp. 626, 627.

Note on a collection of Rothliegende plants from Upper Lusatia. Ferns are the chief part of it, with some fruits, as *Samaropsis*, &c.

——. Beiträge zur fossilen Flora. Steinkohlen-Calamarien, mit besonderer Berücksichtigung ihrer Fructificationen. [Carboni-ferous Calamites and their Fructification.] *Abh. geol. Spezialkarte Preuss.* Bd. ii. Heft 1, pp. i–x, 1–149; Atlas of 19 plates.

Describes 26 species, of which 12 are new: see Index of Species.

Williamson, Prof. W. C. On the Organization of the Fossil Plants of the Coal Measures.—Part vii. *Myelopteris*, *Psaronius*, and *Kaloxylon*. *Phil. Trans.* vol. 166, pt. 1, pp. 1–25, pls. 1–7.

The full text of the memoir noticed in the Geological Record for 1875, p. 340.

——. On the Organization of the Fossil Plants of the Coal Mea-sures.—Part viii. Ferns (continued), and Gymnospermous Stems and Seeds. *Proc. R. Soc.* vol. xxv. pp. 68–73.

Describes the minute structure of a small fern-stem, *Rachiopteris corrugata*, the sporangia of two ferns, the stems of *Dadoxylon*, and several gymnospermous seeds, for which some new genera are established. These are *Lagenostoma ovoides*, *L. physoides*, *Conostoma oblonga*, *C. ovalis*, *C. intermedia*, *Malacotesta oblonga*, *Cardiocarpum compressum*, and *C. Butterworthii*. W. C.

See also :—

Feistmantel, Dr. O. Fossil Floras of India: p. 147 (new species mentioned, p. 148).

Fliche, P. Flora of Champagne Peat-mosses: p. 276.

M'Coy, Prof. F. Tertiary and Palæozoic Plants, Victoria: p. 284.

Roemer, F. Lethæa geognostica: p. 289.

——. Palæontological Notes: p. 290.

Tromelin, G. le G. de, and P. Lebesconte. Silurian Plants, W. France: p. 295.

MAPS AND SECTIONS.

Africa. Geological Sketch Map of South Africa. Scale about 40 miles to an inch. By **E. J. Dunn.** *London.*

Shows Glacial Conglomerate, Tertiary, Oolitic?, Triassic, Dwyka Conglomerate, Carboniferous, Devonian, Silurian, Igneous.

Anatolia. Mining Map of. 8 photographic sheets. Scale 1 : 1,000,000. By **Dr. E. Weiss** [? published in 1876].

England and Wales. 5 Sheets of the *Geological Survey Map.* Scale an inch to a mile.

Sheet 1, N.E. (Chelmsford, Ingatestone, Billericay, Maldon.) New Edition. [Dated 1871, but not published until 1876.] By **W. B. Dawkins, W. H. Penning,** and **H. B. Woodward.** Contains the survey of the Drift-deposits (Boulder Clay, Gravel and Sand, &c.) and the revision of the Bagshot Beds.

Sheet 1, N.W. (Brentwood, Chipping Ongar, Epping, Hoddesdon, Waltham Abbey.) New Edition. By **W. Whitaker, W. B. Dawkins, W. H. Penning, H. B. Woodward,** and **F. J. Bennett.** Contains the survey of the Drift-deposits (Boulder Clay, Gravel and Sand, &c.) and the revision of the Bagshot Beds, &c.

Sheet 1, S.E. (Gravesend, Rayleigh, Rochford, Southend.) New Edition. [Dated 1871, but not published until 1876.] By **H. W. Bristow, W. Whitaker, W. B. Dawkins,** and **H. B. Woodward.** Contains the survey of the Drift-deposits, chiefly Thames Valley gravel and brickearth.

Sheet 1, S.W. (East of London, Barking, Dartford, Greenwich, Romford, Woolwich.) New Edition. [Dated 1872, but not published until 1876.] By **W. Whitaker** and **W. B. Dawkins.** Contains the survey of the Drift-deposits, chiefly Thames Valley gravel and brickearth.

Sheet 48, S.E. (Walton le Soken.) By **W. Whitaker.** Contains Blown Sand and Shingle, Alluvium, Glacial and Post-Glacial Gravel Sand and Loam, Chillesford Beds?, Red Crag, and London Clay.

H. B. W.

England and Wales. 5 Sheets of the "Horizontal Sections" of the *Geological Survey.* Scale 6 inches to a mile.

Sheet 96. Section from the northern side of the Skipton Anticlinal to the middle of the Yorkshire Coalfield, crossing the Millstone Grit of Sheltercliff E.N.E. of Skipton, the Yoredale Rocks and Carboniferous Limestone of Draughton, the Millstone Grit of Rumbles Moor, the outlier of Lower Coal Measures at Baildon, the Millstone Grit of Baildon

Bank, the Lower Coal Measures of Eccleshill, Calverley Moor, Pudsey, Tong, and Gildersome, the Middle Coal Measures of Gildersome, Gildersome Street, Bruntcliffe, Howley Park, Hanging Heaton, the neighbourhood of Dewsbury, Ossett, Horbury, Netherton, Crigglestone, Chapelthorpe, Chevet, and the neighbourhood of Felkirk N.E. of Barnsley. By [Prof.] **A. H. Green, J. R. Dakyns, J. Lucas, R. Russell, C. Fox Strangways,** and **W. H. Dalton.**

Sheet 98. Section across the Millstone Grit of Brimham Rocks, Hartwith Moor, Nabs Ridge, Briscoe Ridge, Great Alms Cliff, Wescoe Hill, Arthington Bank, and Addle; the Lower Coal Measures of Chapel Allerton and Leeds; the Middle Coal Measures of Osmondthorpe; the inlier of Lower Coal Measures at White Beck; the Middle Coal Measures of Temple Newsam, Rothwell, Royds Green, Bottom Boat, Warmfield, and Sharlston, to the neighbourhood of Havercroft. By [Prof.] **A. H. Green, J. C. Ward, J. Lucas,** and **R. Russell.**

Sheet 99. Section from the Magnesian Limestone of Gybdykes, north-east of Masham, over the Millstone Grit of Mickley and Averley; thence across the Magnesian Limestone and Millstone Grit of the country west and south of Ripon; the Millstone Grit of Killinghall; the Millstone Grit and Yoredale Rocks of Harrogate anticlinal; the Millstone Grit of Follifoot Ridge, Spofforth Haggs, Barrowby Grange, the neighbourhood of Harewood, Wike, and Shadwell; the Magnesian Limestone of Ask Bank, near Roundhay Grange; the Lower Coal Measures of Seacroft; and the Middle Coal Measures of Austhorpe and Swillington, to the Alluvial Flat of the River Aire at Mickletown. By **J. C. Ward, J. Lucas, C. F. Strangways,** and **R. Russell.**

Sheet 100. Section from the neighbourhood of Boroughbridge to the centre of the Yorkshire Coalfield, crossing the Triassic Rocks south of Boroughbridge, the Permian Rocks of Knaresborough, Wetherby, Tadcaster, and Aberford; the Lower Coal Measures of Parlington Hollins; the Middle Coal Measures of Garforth and Kippax; the Magnesian Limestone of Preston Hill; and the Middle Coal Measures of Great and Little Preston, Methley, Whitwood, Sharlston, and Nostel. By [Prof.] **A. H. Green, J. R. Dakyns, J. C. Ward, C. Fox Strangways,** and **R. Russell.**

Sheet 110. Section from Byerhope Head, 1 mile east of Allenheads, across the Yoredale Rocks, Millstone Grit, and the Durham Coalfield, through Hunstanworth, the Derwent Lead-mines, Muggleswick, Healeyfield, Iveston, South Moor Colliery, Pelton Colliery, Lambton Park, South Biddick, and West Herrington; thence across the Magnesian Limestone, through Silksworth, Tunstall, and Ryhope Colliery to the coast, 3 miles south of Sunderland. By **H. H. Howell** and **D. Burns.**

H. B. W.

England and Wales. 5 Sheets of the "Vertical Sections" of the *Geological Survey*. Scale 40 feet to an inch.

Sheet 56. Pit Sections and Borings to the Little Limestone Coal in Northumberland and Cumberland (South Tyne District). By **D. Burns.**

Sheets 58, 59. Vertical Section of the Coal Measures of the South Wales Basin from Glyncorrwg Fault to Pembrey Bar Fault, on the North Crop. Showing Relative Position and Average Thickness of each Coal Seam. Arranged from the Sections and Tables as supplied by **H. H. Vivian** to the *Report of the Royal Coal Commission*, 1871.

Sheet 60. Sections of the Northumberland Coal Field (Western District). By **D. Burns.**

Sheet 61. West Lancashire Coalfield. Sections of Shafts sunk in the Middle Coal Measures of Prescot, St. Helen's, Wigan, and Burnley. By **C. E. De Rance** and **A. Strahan.** H. B. W.

Halle. Bodenkarte des Erd- oder Schwemm- und des Felslandes der Umgegend von. By **Rudolf von Benningsen-Förder.** 4 sheets. *Berlin.*

Hérault. Carte Géologique et Minéralogique du Département de l'Hérault. Scale 1 : 80,000. By **Prof. Paul de Rouville.** 4 sheets. *Montpellier.*

Arrondissement de Lodève.—28 divisions are shown, from recent alluvium, tuff and drift-deposits, through various Secondary formations, to Coal Measures and Palæozoic rocks, besides granite, porphyry, and basalt, mineral veins, &c.

Arrondissement de St. Pons.—19 divisions : alluvium, drift, Tertiary beds, Secondary formations, Devonian, Silurian, pegmatites and mica-schists, gneiss, and granite, mineral veins, &c.

Arrondissement de Béziers (this sheet is partly by **E. Dumas**).—38 divisions, from alluvium to Silurian, granite, porphyry, volcanic rocks, veins, &c.

Arrondissement de Montpellier.—27 divisions, from alluvium to Lias, basalt, &c. W. W.

Ireland. 5 Sheets of the Geological Survey Map. Scale an inch to a mile.

Sheet 53. Part of Co. Mayo (part of Ballina, Ballycastle, Inishcrone, Killala). Includes a portion of Killala Bay. By **R. G. Symes.** *Formations* :—Blown Sand ; Peat Bog ; Alluvium ; Drift ; Carboniferous (L. Limestone, oolitic at base ; L. Carboniferous Sandstone) ; Dolerite ; Felstone. The igneous rocks are sparingly represented. Glacial markings are shown.

Sheet 60. Parts of Cos. Down, Armagh, and Louth (Castlewellan, Hilltown, Newry, Rathfriland, Bryansford). Includes part of the Mourne Mountains. By **W. A. Traill.** *Formations* :—Bog ; Alluvium ; Estuarine deposits and Raised Beach ; Drift ; L. Silurian (Bala Beds) ; Altered L. Silurian ; Basalt, Dolerite, Melaphyre, and Diabase Dykes ; Diorite ; Elvanite ; Felstone and Porphyrite ; Granite ; Elvan Dykes ; Pitchstone. Many glacial markings indicated.

Sheet 67. Parts of Cavan, Leitrim, and Roscommon (Ballinamore, Carrick-on-Shannon, Cloone, Drumshambo, Leitrim). Includes por-

tions of the Lough Allen Coalfields. By **R. J. Cruise.** *Formations*:—Bog; Alluvium; Drift; L. Coal Measures; Millstone Grit, with coal-seams; Yoredale shales, with workable ironstones and yellow sandstones; U. Carboniferous Limestone; Calp; L. Limestone; L. Carb. Sandstone; Old Red Sandstone; L. Silurian; Basalt dykes. Coal crops, ironstone localities, and glacial markings are indicated.

Sheet 71. Parts of Armagh, Down, and Louth (Carlingford, Kilkeel, Rostrevor, Warren-point). Includes Carlingford Mts., Southern part of Mourne Mts., Carlingford Lough, and Dundalk Bay. By **W. A. Traill.** *Formations*:—Blown Sand; Bog; Alluvium; Marine Shingle; Raised Beaches and Estuarine Beds; Drift; L. Carboniferous Limestone; L. Carb. Sandstone; Altered Carb. Limestone; L. Silurian; L. Silurian Metamorphosed; Basalt; Dolerite; Melaphyre; Hypersthene Dolerite; Diorite; Porphyrite and Mica-traps; Felstone and Felstone-porphyry; Quartziferous porphyry; Syenite; Granite. Lead ore and glacial markings are indicated.

Sheet 93. Part of Co. Galway (Clifden, Ballynakill Harbour, Cleggan Bay, and Mannin Bay, with Omey Island, and other small Islands in the Atlantic). By **G. H. Kinahan, J. L. Warren, H. Leonard, R. J. Cruise,** and **J. Nolan.** *Formations*:—Bog; Alluvium; Raised Beaches; Blown Sands; Drift; Lower Carboniferous; U. Silurian; Mica-schist, Hornblende-schist, Quartzite, Dolomite, Serpentine, or Steatite; Dolerite, Melaphyre, and Gabbro; Felstone; Elvanite; Diorite, Syenite; Hornblende Rock and Ash, Granite; Copper, Lead, and Iron Pyrites. Glacial markings and many faults are shown. E. T. H.

Italy. Carte géologique coloriée du Lac de Como par **MM. Spreafico et Negri.** La Brianza et à l'Est par M. Stoppani, Blatt xxiv. 1 fol. & 1 8vo. [? Published in 1876.]

Newfoundland. Geological Map of. By **A. Murray.** Scale 25 miles to an inch. [? Published in 1876.]

New South Wales. Mineral Map and General Statistics. By **J. Tayler.** *Sydney.*

Shows sites of gold, silver, copper, iron, lead, tin, coal, diamonds and other gems, and kerosene shale. Areas, statistics of produce in 1874, &c. given on back. Scale 50 miles to an inch. W. H. D.

Northumberland. Sheet 92 of the *Geological Survey Map.* Scale 6 inches to a mile. (Haltwhistle.) By **D. Burns.**

Shows Alluvium, Glacial Deposits, M. and L. Coal Measures, Millstone Grit, Yoredale Rocks, and Basalt.

Norway. Den geologiske Undersögelse, Bladet 14 *D*, *Kristiania* (I Opgaaen af Grændserne har deltagit **O. A. Corneliussen**); Bladet 19 *B*, *Hönefos* (I Opgaaen af Grændserne har deltagit **J. Friis** og **T. Lassen**). By **T. Kjerulf.**

Portugal. Carta geologica de Portugal. By **Carlos Ribeiro** and **J. F. N. Delgado.** Scale 1 : 500,000.

Shows Tertiary, Cretaceous, Wealden, Jurassic, Triassic, Carboniferous, Devonian, Silurian, Cambrian, Laurentian, granite, syenite, diorite, basalt, &c. H. B. W.

Prussia. Geologische Karte von Preussen und den Thüringischen Staaten. Scale 1 : 25,000. Gradabth. lv. Nos. 52, 53, 58, 59 ; lxix. Nos. 4, 5. *Berlin.* [See pp. 95, 96.]

——. Geologische Karte der Insel Sylt und ihrer nächsten Umgebungen. Geologisch bearbeitet durch **L. Meyn.** Scale 1 : 100,000. [See p. 95.]

Russia. Geological Map of the Baltic Provinces. By **Prof. Grewingck.**

Prepared for 2nd edition, and exhibited at the Warsaw meeting of Russian naturalists.

Savoy. By **Viollet-le-Duc.** Le Massif du Mt. Blanc. Carte dressée à $\frac{1}{40000}$. D'après ses relevées et ses études sur le terrain de 1868 à 1875, avec l'aide des minutes du dépôt topographique de la guerre et les levées de M. Mieulet, Capitaine d'Etat-major. 4 sheets, together =1 metre ×1·20.

Printed in 12 colours, showing the rocks, glaciers, lakes, streams, vegetation, &c. Sections contain some geological information.

Scotland. Sheet 6 of the Horizontal Sections of the *Geological Survey.* By **R. L. Jack.**

Section from Carsewell Bridge, across the Calciferous Sandstone Series of the Gleniffer Braes, the Carboniferous Limestone of the Paisley Coalfield, the Calciferous Sandstone Series of the Kilpatrick Hills, and the Lower Old Red between Carman and Benbowie, terminating on the Metamorphosed Lower Silurian of Beim Chaorach, near Garelochhead. J. S. G. W.

——. Geological Map of. By **Prof. A. Geikie.** Scale 10 miles to an inch. *Edinburgh* and *London.*

Shows Post-Tertiary, Miocene, Cretaceous, Oolitic, Triassic, Carboniferous, Old Red Sandstone, Silurian, Metamorphic, Cambrian, Laurentian, and Igneous Rocks. H. B. W.

Switzerland. (*Commission Géologique.*) Sheet 16 of the Federal Atlas. Scale 1 : 100,000.

——. Karte des Ober- und Unter-Engadins. By **J. M. Ziegler.** Scale 1 : 50,000. 2 maps and 4to vol. of text. *Winterthur.*

Shows physical features. (See p. 123.)

United States. Geological Map of Massachusetts. By **W. O. Crosby.** *Boston.*

Rocks shown : *Eozoic*, Norian, Huronian, Mont Alban (granite, gneiss, mica-slate, &c.), and *Palæozoic*. [With Report, see p. 130.]
H. B. W.

Yorkshire. 7 Sheets of the *Geological Survey Map*. Scale 6 inches to a mile.

Sheet 233. (Rothwell.) By [**Prof.**] **A. H. Green, R. Russell,** and **T. V. Holmes.** Shows Alluvium, Gravels, and M. Coal Measures.

Sheet 234. (Castleford.) By **W. T. Aveline,** [**Prof.**] **A. H. Green, R. Russell,** and **T. V. Holmes.** Alluvium, Gravels, Permian, M. Coal Measures.

Sheet 247. (Dewsbury.) By [**Prof.**] **A. H. Green, J. C. Ward,** and **R. Russell.** Alluvium, M. and L. Coal Measures.

Sheet 250. (Darrington, Whitley, Little Smeaton.) By **W. T. Aveline,** [**Prof.**] **A. H. Green,** and **T. V. Holmes.** Recent Deposits (4 divisions), Boulder Beds (2 divisions), Permian (2 marls, 2 limestones), Coal Measures (with sandstone). [Though dated 1875, this sheet was not published until 1876.]

Sheet 276. (Brodsworth, Barnsbrough.) By **W. T. Aveline** and [**Prof.**] **A. H. Green.** Permian, Coal Measures.

Sheet 289. (Rotherham.) By [**Prof.**] **A. H. Green, R. Russell,** and **T. V. Holmes.** Alluvium, Boulder Beds, M. and L. Coal Measures.

Sheet 294. (Sheffield.) By [**Prof.**] **A. H. Green** and **T. V. Holmes.** M. and L. Coal Measures, Millstone Grit. H. B. W. and W. W.

MISCELLANEOUS AND GENERAL.

Abbott, Dr. C. C. The Stone Age in New Jersey. *Smithsonian Report* for 1875, pp. 246–389; 223 figures in 58 plates (unnumbered).

Describes and figures a great number of flint and other implements.

Adams, W. H. D. Beneath the Surface; or, Wonders of the Underground World. 8vo.

Agassiz, Prof. L. Geological Sketches. *Second Series.* Pp. 230. 12mo. *Boston.*

The chapters are on The Glacial Period, The Parallel Roads of Glen Roy in Scotland, The Ice Period in America, Glacial Phenomena in Maine, and The Physical History of the Valley of the Amazon. G. A. L.

Anon. "Feldspar" and "Feldstone" *versus* "Felspar" and "Felstone." *Phil. Mag.* ser. 5, vol. i. pp. 567–569.

Shows that "Feldspar" and "Feldstone" is the original and right way of spelling those words; and recommends British mineralogists to resume the use of the "d." "Felsite," on the other hand, is an old word used in all lands. F. D.

——. [**Nemos.**] Man—Palæolithic, Neolithic, and several other Races not inconsistent with Scripture. *London and Dublin.*

——. The Origin and Development of Man. *Westminster Review*, n. s. no. 97, pp. 62–92.

——. [**H. W.**] The Stone Age in Great Britain. *Leisure Hour*, 1876, pp. 726–728 and 741–744; 17 woodcuts.

Popular description of Neolithic and Palæolithic weapons and implements.

Binney, E. W. On some Bronze Coins found sixty years ago under a Peat Bog at Misterton Car, in Notts. *Proc. Lit. Phil. Soc. Manch.* vol. xv. p. 5.

Of the age of Otho, in a peat-bog 15 feet deep. At the base trunks of yew and oak occurred.

——. On Boulder Stones in the Manchester Drift. *Proc. Lit. Phil. Soc. Manch.* vol. xv. p. 71.

Comments on the importance of preserving boulders from the Glacial Drift, and the necessity of placing them in positions of safety.

Blandet, —. Progrès récents de la géogénie. [Recent Progress in Cosmic Geology.] *Bull. Soc. Géol. France*, 3 sér. t. iv. pp. 43–53.

Blytt, Axel. Essay on the Immigration of the Norwegian Flora during alternating Rainy and Dry Periods.

Notes on recent changes of climate, the Glacial Period, &c. (Notice in *Academy*, July 29, p. 116.)

Boué, Dr. A. Ueber die Fortschritte des Wissens durch Professoren und Privatgelehrte, über die Lehre der geognostischen Ländertypen und der Methode der geologischen Muthmassungen *à priori*. [Types of Geological Structure, &c.] *Sitzb. k. Ak. Wiss. Wien, math.-nat. Cl.* Abth. i. Bd. lxxiv. Heft 2, pp. 241–265.

Instances examples of *à priori* conclusions as to the geological character of certain districts laid down in his geological maps, and verified by subsequent surveys. Discusses the varying types of some formations in different districts, &c. E. B. T.

Brisse, A., and L. de Rotrou. Le Dessèchement du Lac Fucino. 4to. Pp. i, 304, with atlas.

Fucino was the largest lake in Central or Southern Italy; its area averaged 37,050 acres, height above the sea 2094 feet, depth 48 feet. The lake had no outlet. A tunnel to drain it, 6178 yards long, was made by the Emperor Claudius; but this soon became useless. A table of the rocks passed through is given. The lake has recently been drained by Prince Torlonia. (See abstract in *Proc. Inst. Civ. Eng.* vol. li. pp. 367–371.) W. T.

Buckley, Miss A. B. A short History of Natural Science. 8vo. *London.*

Describes Gesner's work on mineralogy, and devotes a chapter of 10 pp. to the history of geology during the eighteenth century, and another of 12 pp. to the chief incidents in geological discovery during the nineteenth. J. E. T.

Capellini, —. Sur l'homme tertiaire, etc. [Tertiary Man.] *Bull. Soc. Anthrop. Paris*, sér. 2, t. xi. pp. 522–529.

Refers to ribs of *Balænotus* bearing marks of alleged human industry.

Challis, Professor. The Relation of the Scripture account of the Deluge to Physical Science. *Trans. Vict. Inst.* vol. x. pp. 66–102.

Argues that geological science does not actually point either to a deluge-epoch or an antiquity of man that can be shown to be inconsistent with historical statements in Genesis. R. B. N.

Chambers, W. The Age of the World. *Chambers' Journal*, September.

Contejean, Prof. C. De l'influence du terrain sur la Végétation.

[Influence of Rock Substratum on Vegetation.] *Ann. Sc. Nat.* sér. 6, *Botan.* t. 2, pp. 222–307. See GEOLOGICAL RECORD for 1875, p. 373.

Salt has a strong influence on plants, and causes the first division into (1) *maritime*, = plants that flourish in soils containing sodic chloride, (2) *terrestrial*, = plants to which it is uncongenial; these latter are divided into *calcicolous* (those that flourish on lime soils), *calcifugous* (those repelled by limestone), and *indifferent* (those that will grow on any soil not containing salt). The chemical influence of the soil is far more powerful than the physical, and the repulsive action of salt or lime than the attractive. Potassium, magnesia, iron, silicon, &c. seem to have no influence on the dispersion of plants, though some have a strong physiological action. Clay has only a physical (mechanical) influence. Lists of European species are given to illustrate soil-influence. E. B. T.

Cooley, W. D. Physical Geography, or the Terraqueous Globe and its Phenomena. Pp. vi, 429, plate, 12 maps, 125 woodcuts. 8vo. *London.*

The parts which bear most on geology are :—Chap. vi. On Internal Heat; xvii. Springs, &c.; xxii., xxiii. Mountains; xxix. Past Changes of Climate; xxx. General Remarks. W. T.

Cotta, Prof. Bernhard von. Geologisches Repertorium. [Repertory of Geology.] *Leipzig.*

The principal works on geology, from those of Agricola and Bernard Palissy to the present day, enumerated, and their characteristic features described. The first part of a work. G. A. L.

Credner, Dr. Hermann. Elemente der Geologie. Ed. 3, pp. xvi, 699; 448 woodcuts. 8vo. *Leipzig.*

Commences with literature, monographs, &c. and the chief geological maps of European States. Section 1. *Physiographical* geology, pp. 5–21. 2. *Petrographical*, including microscopical structure; rocks classified as (*a*) simple, (*b*) mixed, (*c*) klastic. Further (*b*) is subdivided into :—massive crystalline rocks, varieties given in detail, pp. 59–99; and schistose, gneiss, phyllite, &c., pp. 100–107. 3. *Dynamical* geology: vulcanicity, pp. 123–157; hotsprings, earthquakes, pp. 158–179; water-action, chemical and mechanical, glaciation, &c., pp. 180–244; disintegration by atmosphere, organic agents, &c., pp. 245–269. 4. *Petrogenetic*: origin of rocks, eruptive, sedimentary, and metamorphic, pp. 270–311. 5. *Architectonic*: relative positions of rocks, dip, faults, cleavage, mineral veins, &c., pp. 312–340. 6. *Historical*: introductory, touches the transmutation theory, nebular hypothesis, &c., pp. 341–360; Archæan to Kainozoic, pp. 361–678. The eruptive phenomena in each formation have a separate paragraph. Tables of homotaxial beds in different countries also under each formation; and short lists of the commoner fossils. E. B. T.

Cruttwell, —. The Age of Reptiles. *Cardiff Nat. Soc. Trans.* vii. pp. 18–22.

Dale, Nelson. The Harmony between Christian Faith and Physical Science. A Chapter of Christian Philosophy. Pp. 16. *New York.*
Refers to geological matters.

Ébray, Th. Sur l'impossibilité d'établir les limites des Étages et discussion de quelques principes de géologie. [On the Impossibility of establishing Absolute Limits to Formations and on some Principles of Geology.] *Arch. Sci. Phys. Nat.* t. lvi. pp. 96–106, plate 1.
Discusses in succession:—1. The pentagonal system, which he styles a geological heresy now rapidly dying out. 2. The notion of hard and fast lines between successive formations; "Let us seek," he says "the passages between formations, not lines of separation." 3. The method of representing the outlines of ancient seas by means of present outcrops, which he shows to be absurd. 4. The theory of the indefinite divergence of species, taking as a starting-point characters of an inferior order. Believes rather in successive specific creations. Varieties are as useful to geologists as species; but the two must not be confounded.
G. A. L.

Egleston, T. Canfield's Mineral Dresser. *Trans. Amer. Inst. Min. Eng.* vol. iv. pp. 273–276, woodcut.
Describes an instrument used in the School of Mines, New York City, for trimming minerals and geological specimens. R. B. N.

Erdmann, E. Populär geologi, etc. [Popular Geology, with special reference to Sweden.] Ed. 2, pp. 202, 61 figs. in text. 8vo. *Stockholm.*
See notice of Ed. 1 in the Geological Record for 1874, p. 355.

Evans, John. Anniversary Address. *Quart. Journ. Geol. Soc.* vol. xxxii. pp. 53–121.
Solar and Terrestrial Physics, pp. 94–96. Modern Organic Deposits, pp. 96–100. Tropical fossils in Arctic regions, pp. 100–150. Shifting of the earth's axis, pp. 105–111. Geological Progress, Settle Cave, and Subwealden Boring, pp. 113, 114. Supply of Water to London, pp. 115–121. W. H. D.

——. Anniversary Address. *Trans. Watford Nat. Hist. Soc.* vol. i. part 5, pp. 113–124.
Formation of chalk, greensand, red clay, and flint, pp. 115–117. Chalk-rock, p. 117. Local Drifts, pp. 118, 119. Puddingstone, p. 119. Percolation of rain-water, p. 122. W. H. D.

——. Opening Address by the President in Physical Geography Section, Loan Collection Conferences, S. Kensington. *Nature*, vol. xiv. pp. 114–119.

Figuier, L. L'Année Scientifique et Industrielle. XIXth year, 1875. 8vo. *Paris.*
(See pp. 321–344 of *Histoire Naturelle.*) Contains geological notes.

Frank, E. [Lake-dwellings at Schussenried.] *Jahresh. Ver. Nat. Württ.* Jahrg. 32, pp. 55–75, pls. i., ii. (map and view).
Description, with summary, of fauna and flora.

Gainet, Abbé. Accord de la Bible et de la Géologie. Pp. xiv, 683. 8vo. *Rheims and Paris.*

Gastaldi, Prof. G. Frammenti di paleoetnologia italiana. [Prehistoric Ethnology.] 4to, pp. 36; 15 plates, woodcuts. *Rome.* Noticed in *Boll. R. Com. geol. Ital.* vii. pp. 503, 504.

Geikie, Prof. A. Geology. Handbook to the Special Loan Collection of Scientific Apparatus. Pp. 278–290.
A general statement of the scope of geological studies. Refers especially to the microscopic structure of rocks, fossils, and geological surveying. W. T.

——. Geologi. [Geology.] Pp. 1–138. 12mo. *Stockholm.* Translated, with a supplement, pp. 139–162, "On the geological formations," by **E. Erdmann.**

Geikie, James. Historical Geology. Pp. vi, 94. 8vo. *London and Edinburgh.*
Introductory, pp. 7–20. Palæozoic, pp. 21–51. Mesozoic, pp. 52–69. Cainozoic, pp. 69–80. Quaternary, pp. 80–86. Questions, pp. 87–94. W. H. D.

Giaroli, G. Primi elementi di geosofia, ovvero la terra considerata come prima base del ragionamente umano. Pp. 312. 16mo. *Salluzzo.*

Gladstone, Dr. J. H. On the Recent Discovery of a Stone Implement in the Brick-earth of Erith. *Rep. Brit. Assoc.* for 1875, *Sections*, p. 175; and *Argonaut*, Sept. 1875, p. 263.
A flake, found lying amongst rubbish in the pit.

Gosselet, Prof. J. Cours Élémentaire de Géologie. Pp. iv, 199, coloured geol. map and 3 sections (France). 12mo. *Paris.*
Book 1. Formation of rocks, metamorphism, &c., pp. 1–64. Book 2. Geological History: Cosmical, Azoic, Paléontonic, Secondary, Tertiary, and Contemporaneous, pp. 65–192. W. H. D.

Guyerdet, A. Listes des travaux scientifiques d'Élie de Beaumont. [List of Élie de Beaumont's scientific writings.] Pp. 40 (Privately printed?) *Paris.*

Haast, Julius von. New Zealand Prehistoric Skeleton. *Nature*, vol. xiv. pp. 90, 91.

The skeleton was discovered in Moa-bone Point Caves, not in the lower beds containing moa-bones, but in a more modern deposit.

Haughton, Rev. Prof. S. Manual of Geology. Ed. 4. Pp. xvi, 415; 4 diagrams, 18 plates, 48 woodcuts, 2 tables (composition of rocks). 8vo. *London.*

Helmhacker, R. Die Mineralogie und Geognosie für Bergarbeiter an Steigerschulen (Bergschulen). [Geology and Mineralogy for Mining Students.] Pp. 144; 99 figs. 8vo. *Vienna.*

Elementary account of the physical properties of minerals. Pp. 17–37, description of more important ores; an introduction to petrology, with a description of rocks, sedimentation, &c. Pp. 115–135, on mineral veins. E. B. T.

Hochstetter, F. v., and A. Bisching. Leitfaden der Mineralogie und Geologie, für die oberen Klassen an Mittelschulen. Pp. 172; 146 woodcuts. 8vo. *Vienna.*

Hughes, Prof. T. M'K. Geological Measures of Time. *Proc. R. Inst.* vol. viii. pp. 129–136.

Inculcating caution in accepting measures of chronology as exact—either derived from cosmical or geological data. Examines the theory of a general glaciation, with supposed interglacial periods; and the excavation of valleys, as the Rhine, Thames, Somme, connected with the recession of their rapids. E. B. T.

——. President's Address. *5th Ann. Rep. Chester Soc. Nat. Sci.* pp. 11–19.

Suggests a number of points requiring elucidation in local and general geology.

Jannetaz, Ed. Éléments de Géologie. [Ed. 3.] Pp. 63. 8vo. *Paris.* [? 1876.]

An elementary primer. Contains a classification of siliceous rocks with tables, and the outlines of physical and historical geology.

Jolly, W. The Scientific Materials of the North and our Scientific Work. *Inaugural Address to Inverness Sci. Soc. and Field Club.* Pp. 24. 8vo. *Inverness.*

The geology and physical geography of the district described, pp. 6–9, 11–12.

Jones, Prof. T. R. The Antiquity of Man, Illustrated by the Contents of Caves and the Relics of the Cave-folk. *Geol. Mag.* dec. ii. vol. iii. pp. 269–272. Abstract.

Refers to the British palæolithic implements, the Danish peat-bogs,

Swiss lake-dwellings, and French and Swiss cave-deposits; and summarizes the history of West Yorkshire from the preglacial age to the historic period. W. H. D.

Judd, Prof. J. W. Palæontology and the Doctrine of Descent. *Nature*, vol. xv. pp. 275, 276.

Refers to labours of Dr. Neumayr, of Vienna, in the lacustrine series, 2000 feet thick, forming the highest part of the Tertiaries of E. Europe, probably Pliocene. C. E. D.

Kane, Sir Robert. Anniversary Presidential Address. *Journ. R. Geol. Soc. Ireland*, ser. 2, vol. iv. pt. 3, pp. 104–111.

Gives a *résumé* of the paper read before the Society in 1875.

Laube, —. Standpunkt und Aufgaben der Geologie und Palæontologie in der Gegenwart. [Present State of Geology and Palæontology.] *Lotos.*

Lavaux, Eugène. Nouveau système du monde, ou les premières forces de la Nature. [New World System, or the Primary Forces of Nature.] Ed. 3. *Paris.*

Leymerie, —. Note sur les Cartes agronomiques comparées aux Cartes géologiques. [Agricultural and Geological Maps compared.] Pp. 7. *Toulouse.* [1876 ?]

Long, Wm. Stonehenge and its Barrows. *Wiltsh. Arch. Nat. Hist. Mag.* vol. xvi. no. 46, pp. 1–244.

The geological nature of the stones is discussed, pp. 59, 68–77.

Lyell, Sir Charles. Principles of Geology, or the Modern Changes of the Earth and its Inhabitants considered as illustrative of Geology. Ed. 12. 2 vols. 8vo. *London.*

Macturk, John. Physical Geography adapted to the requirements of the Science and Art Department. Pp. 156; 5 maps, 26 woodcuts. 8vo. *London and Glasgow.*

Chap. vi., Structure of the Earth (pp. 112–131), gives a general description of geology, volcanoes, coral reefs, &c.

Magitot, —. Sur l'homme tertiaire, etc. [Tertiary Man.] *Bull. Soc. Anthrop. Paris*, sér. 2, t. xi. p. 523.

Note of observations and experiments on the marks on fossil bones (*Balænotus*) attributed to the hand of man. (See **Capellini**, p. 52.)

Malet, H. P. The Sea-level. *Geogr. Mag.* dec. ii. vol. iii. pp. 216–218, 247–250.

Combats the received explanation of strata being exposed above the sea-level, and maintains that the sea must have sunk.

Martins, Charles. Valeur et Concordance des Preuves sur lesquelles repose la Théorie de l'Evolution en Histoire Naturelle. *Rev. Deux Mondes*, Feb. 15. Pp. 24.

McFarland, R. W. Curve of Eccentricity of the Earth's orbit. *Amer. Journ.* ser. 3, vol. xi. pp. 456–458; figure in text.

Gives a diagram showing this curve according to Croll and also according to Stockwell. For the last 40,000 and for the next 30,000 years the two are almost identical. Stockwell's is more nearly correct than Croll's; but there is substantial agreement. G. A. L.

Merk, Conrad. Excavations at the Kesslerloch, near Thayngen, Switzerland, a Cave of the Reindeer Period. Translated by **J. E. Lee.** Pp. viii, 68; 15 plates. 8vo. *London.*

Describes the cave and the differently coloured deposits. The relics from each were collected separately, but do not prove any difference of age between them. Altogether about 30 cwt. of bones were found, and determined by Prof. Rütimeyer, the main results being here given. The climate of the neighbourhood, as shown by the fauna, must have been more polar than during the later lake-dwelling period. Human bones are absent (except a single collar-bone); but weapons are numerous; *e. g.* above 12,000 flint flakes, 55 arrow heads, 133 lance heads, &c. are noted. The incised carvings (representations of animals) are reproduced. E. B. T.

Micault, Victor. Discussion des divers chronomètres fournis par la géologie pour mesurer l'antiquité du monde. [Various Geological Methods of measuring the Age of the World.] *Mém. Soc. Émul. Nord.* Pp. 57.

Mietzsch, —. [On Geological Mapping.] *Zeitsch. deutsch. geol. Ges.* Bd. xxviii. Heft 3, pp. 634–639.

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Miller, R. On Dislocations in the Thill, with the Presence, Amount, and Tension of Gas in the Silkstone Seam of Strafford Main Colliery. *Trans. N. Engl. Inst. Eng.* vol. xxxv. p. 23.

Morton, G. H. Notes on the relation between the Mineral Flint and the County of Flint. *Proc. Liverpool Geol. Soc.* vol. iii. pt. ii. pp. 94–96.

Suggests the possibility of the name of the county-town being derived from the extensive beds of flint, now worked for use in the potteries, at Halkin Mountain, two miles off. C. E. D.

Nehring, —. Die geologischen Anschauungen des Philosophen Seneca. [Seneca's Geological Views.] Part ii. Pp. 26. 4to. *Wolfenbüttel.*

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Manual of scientific inquiry, specially for the use of the German Navy. Collected articles by several contributors.

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Localities of geological interest are often vaguely cited as "near" such a town. To define precisely the position, reference should be made to a standard map; and the author proposes a method to supersede the common practice of dividing a map into squares, with reference-letters and figures on the margins. He divides the *left-hand* and *lower* sides of the map into centimetres, numbering them from the upper left corner uninterruptedly to the lower right corner. A slip of paper is then divided into centimetres, and hinged to the upper right-hand corner of the map, the point of rotation being zero. Exact references are got by combining the numbers on the margin and on the diagonal slip. F. W. R.

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T. M. H.

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ADDENDA.

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Comments on the absence of any boulders from Shap Fell.

Caminero, J. Formacion hullera de Puertollano. [Coal Measures of Puertollano.] *Bol. Com. map. geol. Españ.* t. iii. pp. 245–250.

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Notices the great Devon Limestone with its fossils and volcanic ash beds. The relations of the Ashburton limestones and the formations which appear to succeed them are briefly described, and patches of Culm Measures at Connator Hill and Two Mile Oak are noticed. T. M. H.

Church, [Prof.] A. H. Some Notes from an Old Catalogue of Minerals. *Min. Mag.* no. 2, pp. 48, 49.

A MS. catalogue of a collection made for the Brazilian Government by the Comte de Bournon, probably in 1811.

——. Manganese in the Sea. *Min. Mag.* no. 2, pp. 50–53.

Examination of manganese-nodules from deep dredgings in the Pacific. Percentage composition :—H_2O 34·55; MnO_2 30·22; Fe_2O_3 20·02; Al_2O_3 3·3; SiO_2 10·37; Cl 0·71, Mg, Ca, Cu, Na, P_2O_5, &c. 0·83. If the nodules represent a distinct species, it may be termed *Pelagite*.

F. W. R.

Collins, J. H. Note on New Minerals from West Phœnix Mine and from St. Agnes. *Min. Mag.* no. 1, pp. 11–15.

Henwoodite is a new mineral from West Phœnix Mine, Cornwall. Analysis suggests the formula :—

$2Al_2O_3 . P_2O_5 + 2(\frac{1}{6}CuO . \frac{5}{6}H_2O)_3 . P_2O_5 + 5H_2O$. H=4–4·5; G=2·67.

It occurs in bluish-green or turquoise-blue globular crystalline masses. *Enysite* is a new mineral from St. Agnes, Cornwall. Analysis corresponding fairly with the formula

$CuSO_4 + CuH_2O_2 + 3Al_2H_6O_6 + 12H_2O$. H=2–2·4; G=1·59.

Occurs as a bluish-green stalagmitic crust, probably of recent origin.

F. W. R.

——. Note on the occurrence of Scorodite, Pharmacosiderite, and Olivenite in Greenstone at Terras Mine, St. Stephen's. *Min. Mag.* no. 1, pp. 16, 17.

——. Note on the occurrence of Achroite at Rock Hill, in the parish of St. Austell, Cornwall, and on the Black Tourmaline of the same locality. *Min. Mag.* no. 2, pp. 55–58.

Dawson, J. W. Carboniferous Land Shells. *Nature*, vol. xv. p. 317.

Note of the discovery at South Joggins, Nova Scotia, of *Pupa vetusta*, in hardened clay filling an erect *Sigillaria*, 2000 feet above where it was first found in the coal series. C. E. D.

Des Cloiseaux, M. Mémoire sur l'existence, les propriétés optiques et crystallographiques, et la composition chimique du Microcline, nouvelle espèce de Feldspath triclinique à base de Potasse, suivi

de remarques sur l'examen microscopique de l'orthose et des divers Feldspaths tricliniques. [The Optical and Crystallographical Properties and the Chemical Composition of *Microcline*, a new species of Triclinic Felspar with a potash base; with remarks on the Microscopic Examination of Orthoclase and of various Triclinic Felspars.] *Ann. Chim. Phys.* sér. 5, t. viii. pp. 433–499; 12 photographs and woodcut.

Désor, Prof. Sur un sondage à Rheinfelden. [Boring at Rheinfelden.] *Bull. Soc. Sci. Nat. Neuchâtel*, t. x. no. 3, p. 233. [See also p. 58.]

——. Sur la Géologie et les fossiles de Gothland. [Geology and Fossils of Gothland.] *Bull. Soc. Sci. Nat. Neuchâtel*, t. x. no. 3, p. 241.

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Doelter, Dr. C., and E. Mattesdorf. Chemisch-mineralogische Notizen. [Tyrolese Minerals.] *Verh. k.-k. geol. Reichs.* p. 32; and *Boll. R. Com. geol. Ital.* vol. vii. p. 165.

Dudgeon, Patrick. Historical Notes on the Occurrence of Gold in the South of Scotland. *Min. Mag.* no. 1, pp. 21–28.

Fischer, P. Sur les Coquilles récentes et fossiles trouvées dans les Cavernes du Midi de la France et de la Ligurie. [Shells of Caves of S. France and Liguria.] *Bull. Soc. Géol. France*, sér. 3, t. iv. pp. 329–342.

Chiefly anthropological. Gives lists of shells from various caverns.

Foster, Dr. C. Le N. Notes on New Minerals and Mineral Localities in Cornwall and Devon. *Min. Mag.* no. 1, pp. 8–10.

Preliminary notices and blowpipe-analyses of the new species *Henwoodite* and *Enysite*. Announces the occurrence of pyrophyllite at Brookwood mine; of actinolite with green garnets at S. Terras iron-mine, near Grampound Road; and of actinolite, garnet, and axinite near South Brent. F. W. R.

——. Description of a new form of Blowpipe Lamp, especially suitable for Travellers. *Min. Mag.* no. 1, p. 20.

Fox, Charles. On a Diamond Field, Griqualand West, South Africa. *Trans. R. Geol. Soc. Cornwall*, vol. ix. pt. ii. pp. 165, 166.

The diamond-bearing ground is 6 acres in extent, surrounded by schist. There is about one diamond in a barrow-load.

Friedel, M. C. Sur certaines altérations des Agates et des Silex. [Alteration of Agate and Flint.] *Ann. Chim. Phys.* sér. 5, t. vii. pp. 540–546.

Girard, Aimé, and Henri Morin. Étude sur les Pyrites employées

en France à la Fabrication de l'Acide sulfurique. [Pyrites used in France for Manufacture of Sulphuric Acid.] *Ann. Chim. Phys.* sér. 5, t. vii. pp. 229–264; 5 woodcuts.

Describes the various deposits of pyrites worked in France, and gives many analyses. Contains notes on and analyses of foreign pyrites imported into France. Gives statistics. F. W. R.

Hall, Prof. James. Map Illustrating the Paper on the Relations of the Niagara and Lower Helderberg Groups and their Geographical Distribution. *28th Ann. Rep. New York State Mus.* The paper is noticed in GEOLOGICAL RECORD for 1874, p. 117, from *Proc. Amer. Assoc.* for 1873. Published also in 1875 in *27th Ann. Rep. New York State Mus. Nat. Hist.* pp. 117–131.

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Remarks, pp. 13–15, on the Chemung and Catskill Groups in New York State.

Hankel, W. Ueber die thermoelektrischen Eigenschaften des Kalkspathes, des Berylles, des Idocrases (Vesuvianes) und des Apophyllites. [Thermo-electric Properties of Calcite, Beryl, Idocrase or Vesuvian, and Apophyllite.] *Ann. Phys. Chem.* 6 Reihe, Bd. vii. pp. 156–164.

Haughton, Rev. Samuel. Remarks on the "Principle of Least Paste" as regulating the Crystallization of Fused Rocks. *Min. Mag.* no. 2, pp. 46, 47.

Heddle, Prof. M. F. Address on "The How and Where to collect Minerals in Scotland." *Min. Mag.* no. 2, pp. 29–40.

Hermann, R. Untersuchungen über die Zusammensetzung von Shepard's Hermannolith. [Composition of Hermannolite.] *Journ. prakt. Chem.* F. 2, Bd. xiii. pp. 386–395. See GEOLOGICAL RECORD for 1875, p. 390.

An examination of the new mineral Hermannolite, Shepard, leads to the formula $2(2RO \cdot 3NbO_2) + RO \cdot Me_2O_5$, where $RO = (MnO_2 \cdot FeO)$ and $Me_2O_5 = (\frac{1}{4}Ta_2O_5 \cdot \frac{3}{4}H_2O_5)$. It therefore differs from Columbite, of which it was formerly considered to be a variety, and from all other known minerals of the Ta group. Loc. Haddam, Connecticut; crys. pyramidal; colour black; streak black-brown; sp. gr. 5·32. F. W. R.

Jolly, W. The Scientific Materials of the North, and our Scientific Work. The Inaugural Address delivered before the Inverness Scientific Society and Field Club. Pp. 27. 8vo. *Inverness.*

Geology of the district, pp. 6–9; Physical Geography, p. 12.

Klien, Dr. Paul. Beiträge zur Kenntniss des Gypses. [Contributions to a Knowledge of Gypsum.] *Ann. Phys. Chem.* 6 Reihe, Bd. vii. pp. 611–621.

Laspeyres, H. Der Lithion-Psilomelan von Salm-Chateau in Belgien

und die chemische Constitution der Psilomelane. [The Lithia-psilomelane of Salm Chateau, Belgium; and the Chemical Constitution of Psilomelane.] *Journ. prakt. Chem.* F. 2, Bd. xiii. pp. 1–28.

Finds Lithia in many manganese-ores. Some varieties of psilomelane are rich enough to be distinguished as *lithia-psilomelane*. Gives analysis of specimen from Salm Chateau, which yielded 0·468 p. c. of Li_2O. Cites various views on the composition of psilomelane generally, and concludes that trustworthy analyses of pure material lead to the formula $x(H_4MnO_5)$. Suggests that some varieties may be utilized for the preparation of lithium compounds. The Salm-Chateau mineral also contains vanadium. F. W. R.

Laspeyres, H. Ueber die chemische Constitution der Braunsteine, ein Beitrag zur Kenntniss der Werthigkeit des Mangans. [Chemical Constitution of "Brown-stones."] *Journ. prakt. Chem.* F. 2, Bd. xiii. pp. 176–215.

Discusses analyses of the manganese-ores grouped under the general name *Braunsteine*; and concludes that they may all be regarded as manganates. Much of the memoir is purely chemical. The valency of Mn is discussed. F. W. R.

——. Die Constitution der aluminiumhaltigen Braunsteine. [Constitution of Aluminiferous Manganese-ores.] *Journ. prakt. Chem.* F. Bd. 2, xiii. pp. 215–236.

Describes the lustrous psilomelane (*Glaskopfbraunstein*) of Kalteborn, near Siegen. It contains 6·472 p. c. of alumina and 0·215 p. c. of lithia. Also describes other manganese-ores which contain alumina. F. W. R.

——. Ueber die chemische Constitution des Maxit. [Chemical Constitution of Maxite.] *Journ. prakt. Chem.* F. 2, Bd. xiii. pp. 370–385.

Analyses of Maxite confirm the empirical formulæ $H_{10}Pb_{18}C_9S_5O_{56}$. Sp. gr. at 16°=6·509. Maxite may be identical with Leadhillite, the water having been overlooked in analyses of the latter, or estimated as CO_2. F. W. R.

——. Chemische Untersuchungen von Nickelerzen. [Nickel-ores.] *Journ. prakt. Chem.* F. 2, Bd. xiv. pp. 397–413.

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W. H. D.

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the Kuenluen Nephrite and associated Rocks.] *Sitz. math.-phys. Cl. k.-bay. Ak. Wiss.* Bd. iv. pp. 63–68.

Schlüter, Clemens. Ueber einige jurassische Crustaceen-Typen im obern Kreide. [U. Cretaceous Crustacea of Jurassic type.] *Verh. nat. Ver. preuss. Rheinl.* ser. 4, t. i. pt. 1, p. 41.

Schmid, Dr. E. E. Ueber den unteren Keuper des östlichen Thüringens. [L. Keuper of E. Thuringia.] *Abh. geol. Spezialkarte Preuss.* Bd. i. Heft 2, pp. 75 (185–260), 1 pl. fossils.

Describes the range, characters, &c. of the beds and their minerals (with analysis of celestine), and gives lists of fossils.

Schmidt, Fr. [Russian Silurian *Leperditiæ*; title, &c. in the Geological Record for 1874, p. 320.] *Mém. Ac. Imp. Sci. St. Pétersbourg*, t. xxi., plate.

Describes the new sp. *Leperditia Barbotana*, *L. tyraica*, *L. Wilniensis*, *L. parallela*, and *Isochilina Maaki*.

Schtjurowsky, Prof. [*Amianthus* at Melkowodka, Nijni Novgorod.] *Iswestija Imp. Obw. Lubet. Estest. Antrop. Etnogr.* Bd. xiv. p. 6.

Scudder, S. H. Two New Fossil Cockroaches from the Carboniferous of Cape Breton. *Canad. Nat.* n. s. vol. vii. pp. 271, 272.

Describes wings of *Blattina Bretonensis* and *B. Heeri* occurring in dark grey shale, associated with leaves of *Sphenophyllum* and ferns.

Seguenza, Prof. G. Dell' Oligoceno in Sicilia. [Sicilian Oligocene.] *Sci. Contemp.* ann. ii. fasc. 4, pp. 11.

——. L'Oligoceno in Sicilia. [Sicilian Oligocene.] *Rend. Ac. Sci. Napoli*, pp. 2.

Describes the series, giving lists of fossils.

——. Ricerche paleontologiche intorno ai Cirripedi terziarii della provincia di Messina, con Appendice intorno ai Cirripedi viventi nel Mediterraneo, e sui fossili terziarii dell' Italia meridionale. [Tertiary Cirripeds of Messina and S. Italy.] Part i. (Balanidæ and Verrucidæ). *Atti Ac. Pontan.* vol. viii. (?), p. 102; 7 pls.

Silvestri, Prof. O. Sulla cristallizzazione del Solfo in Forme appartenenti al sistema trimetrico mediante la Fusione in grande Massa. [Trimetric Sulphur, Sicily.] *Atti Ac. Gioen. Sci. Nat.* ser. 3, t. ix. pp. 1–8, plate.

Notes on form, specific gravity, fusibility, and specific heat.

Spitaels, —. [Deposits of R. Marque.] *Ann. Soc. Géol. Nord*, 1870–1874, p. 32.

Steenstrup, K. J. V. Om de Kuhlförende Dannelser paa Öen Disko, Hareöen og Syd-Siden af Nügssuak's Halvöen i Nord-Grönland,

[Coal-bearing Rocks of Disco I., &c., Greenland.] *Vid. Medd. Nat. Foren. Kjöbenhavn*, nos. 3–7.

Stefani, C. de. Fossili pliocenici dei dintorni di San Miniato. [Pliocene Fossils of San Miniato.] Pp. 86. 8vo. *Pisa.*

Stevens, R. P. Observations on some Irregularities of the Floor of the Coal Measures of Eastern Kentucky. *Ann. Lyc. Nat. Hist. N. York*, vol. xi. pp. 18–20.

Details of the variations of the beds immediately below the Coal Measures.

Strobel, P. Intorno all' origine delle Terremare. *Arch. Antrop. Etnol.* vol. iv. pp. 9.

Stur, D. Ueber den gelben oberen Tegel in der Tegelgrube von Voslau. [U. Neogene of Voslau.] *Verh. k.-k. geol. Reichs.* pp. 336–343.

Gives a list of 134 mollusca.

Szabo, Dr. J. Zur Kenntniss der Trachytbildungen des ungarisch-siebenbürgischen Grenzgebirges. [Trachytes of Hungary and Transylvania.] *Jahrb. kön.-ung. geol. Anst.* pp. 78, 178.

Taramelli, T. Appunti sulla Storia Geologica dell' Istria e delle isole del Quarnero. [Geology of Istria and Quarnero.] Pp. 38, plate. 8vo. *Venice.*

Thielens, [Dr. A.] [Further List of Eifel Fossils.] *Ann. Soc. Mal. Belg.* t. viii. *Bull.* p. lxxviii.

Tournouër, R. Sur les Mollusques du terrain Nummulitique de Biarritz recueillis par M. de Bouillé. [Mollusca from the Nummulitic beds of Biarritz.] *Bull. Soc. Géol. France*, t. ii. pp. 262–264.

Trautschold, H. [Devonian Fish, Tula Govt., Russia; title, &c. in Geological Record, for 1874, p. 376.] *Mém. Soc. Imp. Nat. Mosc.* t. xiii. pls. xxvi., xxvii.

Describes amongst others 10 new species (see Index).

——. [Carboniferous Limestone near Moscow; title in Geological Record for 1874, p. 376. *Mém. Soc. Imp. Nat. Mosc.* pls. xxviii.–xxxi.

Gives analyses by **Grigoriev** and **Prof. Laskowsky**, and describes, amongst others, 11 new species of fish, 3 gasteropods, and 2 bivalves (see Index). W. H. D.

Trechsel, W. Analyse d'un nouveau minéral voisin de la Binnite. [New mineral allied to Binnite.] *Bull. Soc. Indust. Mulhouse*, t. xliv. p. 273.

Tschekanowskij, A. [Geological Examination of the Irkutsk Province.] *Iswestija Sibirsk. Otd. Imp. Ross. Geogr. Obw.* Bd. xi.
The coal-bearing beds (5 divisions) are Jurassic. Silurian, Devonian, and Glacial beds are also described.

Tschermak, G. [Meteoric Iron of Greenland, &c.] *Naturforscher*, nos. 49–52.

Van Horen, [Dr.] Fr. Polypiers nouveaux du terrain dévonien de Belgique. [Devonian Corals of Belgium.] *Ann. Soc. Mal. Belg.* t. viii. *Bull.* p. cxxxiv.

Vincent, [G.] [Heersian Fossils.] *Ann. Soc. Mal. Belg.* t. viii. *Bull.* pp. xliv, xlv.

White, J. C. Notes on the Coal Measures of Beaver County, Pennsylvania. *Ann. Lyc. Nat. Hist. N. York*, vol. xi. pp. 14–18.

——. Notes on the Upper Coal Measures of Western Virginia and Pennsylvania. *Ibid.* pp. 46–57.
These two papers consist of remarks on the principal beds of coal, &c.

Winter, F. Analyse einer kohlensäurehaltigen Mineralquelle bei Gerolstein in der Eifel. [Carbonated Mineral Water of Gerolstein, Eifel.] *Verh. nat. Ver. preuss. Rheinl.* F. 4, Bd. i. p. 87.

Young, Prof. John. Physical Geography. Pp. 368. 8vo. *London and Glasgow.*
Chap. i. (pp. 13–54) is geological; and there are geological references throughout, the subject being treated to a large extent from a geological point of view. W. W.

Zigno, Baron A. de. Catalogo ragionato dei Pesci fossili di Monte Bolca e Monte Postale. [Catalogue of Fossil Fish of Mts. Bolca and Postale.] *Atti R. Ist. Ven. Sci.* ser. iv. vol. iii. pp. 9–199.
Enumerates 170 species.

Zirkel, F. Der Phyllit von Recht im Hohen Venn. *Verh. nat. Ver. preuss. Rheinl.* F. 4, Bd. i. pl. i. p. 83.

Zsigmondy. W. Das Heilbad Buzias und die daselbst in neuester Zeit ausgeführten Bohrungen. [Recent Borings at the Baths of Buzias, near Temesvar.] *Jahrb. kön.-ung. geol. Anst.* p. 159, map.

Index to the Colours and Signs employed on the Maps and Sections of the Geological Survey of Great Britain.
A coloured sheet. The rocks, as developed in various districts, are shown in parallel columns.

2. FOR 1875.

Achiardi, Prof. A. D'. Coralli Eocenici del Friuli. *Atti Soc. Tosc. Sci. Nat.* vol. i. fasc. 2, pp. 115–124, pls. vi., vii. (Continued in 1876 : see p. 269.)

Continuation of work noticed in the GEOLOGICAL RECORD for 1875, p. 297. The following new species are described—*Circophyllia* ? *cingulata*, *C. elliptica*, *Leptaxis sulcata*, *L. Reussana*, *Leptophyllia* ? *Catulliana*, and *Montlivaultia Pironæ*. W. H. D.

Alth, Dr. A. Rzecz o pochodzeniu Belemnitów z Mieczaków Glowonogich Oskorupionych. *Ramietnik Ak. Umiej. Krakow mat.-przyr.* t. ii.

Baccarini, Alfredo. Le acque e le trasformazioni idrografiche in Italia. [The Waters and Hydrographic Changes of Italy.] *Rome.* Noticed in *Giornale del Genio civile*, vol. xix. p. 26 (1876), and in *Proc. Inst. Civ. Eng.* vol. xlix. pp. 327–330.

Gives particulars of area, discharge, &c. of 100 rivers and torrents, and of the changes which they have undergone.

Bellardi, A. Novæ Pleurotomidarum Pedemontii et Liguriæ fossilium dispositionis prodromus. [Plan of New Classification of the Fossil Pleurotomidæ of Piedmont and Liguria.] *Bull. Soc. Mal. Ital.* vol. i. pp. 9.

Bittner, Alexander. [Tertiary Brachyura of the Vicentin ; title in GEOLOGICAL RECORD for 1875, p. 298.] *Denkschr. k. Ak. Wiss.* Bd. xxxiv. p. 63 ; 5 pls. and folding table of Eocene Brachyura arranged by countries.

Describes, amongst others, 16 new species (see Index).

Bleicher, —. Note sur la géologie des environs d'Oran. [Geology of Oran.] *Bull. Soc. Géol. France*, sér. 3, t. iii. pp. 187–193.

The Djebel Santo massif consists of Oxfordo-Callovian schists, overlain unconformably by Miocene, and these by Pliocene beds. The Quaternary rocks are basalt, travertin, and alluvium. There are pre- and inter-Miocene igneous rocks. The geological history of the district is shown by a table. W. H. D.

Bolton, Prof. H. C. Index to the Literature of Manganese, 1596–1874. *Ann. Lyc. Nat. Hist. N. York*, vol. xi. pp. 208–247.
General Literature, pp. 208–237. Minerals, pp. 238–244.

Bombicci, L. Corso di Mineralogia. Ed. 2, vol. ii. Pp. 1032. 8vo. *Bologna.*

Boué, Dr. Ami. Ueber Temperaturzunahme mit der Tiefe der Erde. [On Rise of Temperature with Depth.] *Anz. k. Ak. Wiss.* No. xxvi.

Burmeister, H. Los Caballos fosiles de la Pampa Argentina. Die fossilen Pferde der Pampas-formation eine im Auftrage der Provinzial Regierung von Buenos Aires ..... [Fossil Horses of the Pampas.] Pp. viii, 88, 8 pls. 8vo. *Buenos Ayres.*
Monograph prepared for the Philadelphia Exhibition.

Carruthers, William. Note on the Flora of the Gault, with Description of a New Pine Cone. *Proc. Geol. Assoc.* vol. iv. no. 4, pp. 278–281, woodcut.
The new cone is *Pinites Pricei*, from Folkestone.

——. On the Flora of the London Clay of Sheppey. *Proc. Geol. Assoc.* vol. iv. no. 5, pp. 318, 319.
Considers that the deposits in the Isle of Wight and at Bournemouth, which contain leaves of plants in a white pipe-clay, belong to a similar flora as that represented by the London Clay fruits of Sheppey, among which leaves are absent. R. B. N.

Coquand, H. Comparaison des divisions adoptées par M. Hébert pour la Craie du Midi de la France avec celles adoptées par M. Coquand. [Comparison of Hébert's and Coquand's Divisions of S. French Cretaceous.] *Bull. Soc. Géol. France*, ser. 3, t. iii. pp. 265–270.

Cossigny, J. C. de. Sur les puits naturels des environs de Mons (Belgique). [The Natural Pits of Mons.] *Paris.*
Argues that the vertical cylindrical holes known as "Natural Pits" are due to water passing downwards.

Cotteau, —. Description des Echinides Tertiaires des Iles Ste. Barthélemy et Anguilla. [Tertiary Echini of St. Bartholomew and Anguilla, West Indies.] *K. Svenska Vet.-Akad. Handl.* Bd. 13, pp. 48, 8 pls.
Describes 33 species, 31 of which are new: see Index of Species.

Carpenter, Dr. W. B. Summary of Recent Observations on Ocean Temperature made in H.M.S. 'Challenger' and U.S.S. 'Tuscarora;' with their bearing on the Doctrine of a General Oceanic Circulation sustained by Difference of Temperature. *Proc. R. Geogr. Soc.* vol. xix. pp. 493–514.
Contains notes on the nature of the bottom of the Pacific, with considerations as to the bearing of the facts on the question of subsidence.

Ciofalo, S. Cenni sul terreno nummulitico dei dintorni di Termini-Imerese. [Nummulitic of Imeretia.] *Ann. Soc. Nat. Modena*, ser 2, ann. ix. pp. 4.

Cope, Prof. E. D. Supplement to the Extinct Batrachia and Reptilia of North America. *Trans. Amer. Phil. Soc.* n. s. vol. xv. pt. ii. pp. 261–278.

Descriptive catalogue, the following being new species :—*Phlegethontia linearis, Molgophis Wheatleyi, Sauropleura longipes, Tuditanus punctulatus, T. brevirostris, T. radiatus, T. mordax, T. Huxleyi, Colosteus pauciradiatus*, and *Cocytinus gyrinoides*. W. H. D.

Credner, Dr. Ueber die Enstehungsweise der granitischen Gange des sächsischen Granulitgebires. [Origin of the Granitic Dykes of the Saxon Granulite Mountains.] *Sitz. nat. Ges. Leipzig*, Jahrg. 2, pp. 3–5.

——. Ueber das neue Vorkommen von bunten Tourmalinen bei Wolkenburg in Sachsen. [Brown Tourmaline at Wolkenburg, Saxony.] *Sitz. nat. Ges. Leipzig*, Jahrg. 2, pp. 49, 50.

Crespellani, A. Nota geologica sui terreni e sui fossili del Savignanese. [Geology and Palæontology of the Savignanese.] *Ann. Soc. Nat. Modena*, ser. 2, ann. ix. pp. 29.

Curley, E. A. Nebraska: its Advantages, Resources, and Drawbacks. Maps and plans. *London.*

Contains 2 chapters on the Surface Geology.

Daintree, Richard. Notes on the Microscopic Structure of certain Igneous Rocks submitted by the Director of the Geological Survey of New Zealand. *Trans. N. Zealand Inst.* vol. vii. pp. 458–460.

Describes dolerites, trachytes, granite, and pitchstones.

Dewalque, Prof. G. Documents relatifs à la publication d'une Nouvelle Carte Géologique de la Belgique. Pp. 47. 8vo. *Brussels.*

Dollfus, Gustave. Note sur des Empreintes attribuables à une Actinie (? *Palœactis vetula*) dans les Schistes Cambriens des Moitiers d'Allonne. [Impressions of an Actinia in Cambrian Schist, Normandy.] *Mém. Soc. nat. Sci. nat. Cherbourg*, t. xix. pp. 225–232, pl. iii.; and *Bull. Soc. Géol. France*, sér. 3, t. iv. pp. 470, 471.

Describes and figures impressions attributable to a new Actina, *Palœactis vetula* (n. gen. and sp.).

Domeyko, I. Note sur deux nouvelles météorites du désert d'Atacama, et observations sur les météorites qui ont été découvertes jusqu'ici dans cette partie de l'Amérique méridionale. [2 New Meteorites from Atacama, and other Meteorites from S. America.] *Compt. Rend.* t. lxxxi. pp. 597–600.

Door, P. J. Java: Geographisch, Ethnologisch, Historisch. Vol. i. *Haarlem.*
The first book contains a chapter on the geology and mineralogy.

Drasche, Dr. R. v. Die Vulcane der Insel Reunion (Bourbon). [The Bourbon Volcano.] *Verh. k.-k. geol. Reichs.* pp. 285–288.

Drummond, A. T. Botanical and Geological Notes. *Canad. Nat.* n. s. vol. vii. pp. 217–223.
States reasons for thinking "the distribution of some Canadian plants an argument for the marine origin of the Erie Clays."

Ehrenberg, — Die Sicherung der Objectivitat der selbststandigen mikroskopischen Lebensformen und ihrer Organisation durch eine zweckmassige Aufbewahrung. [Microscopic Organisms.] *Monatsb. k. preuss. Ak. Wiss.* pp. 71–81.
Gives a list of deposits containing microscopic organisms.

Ferretti, A. Periodo glaciale subapennino od epoca prima dell' èra neozoica. [Subapennine Glacial Period in the Early Neozoic.] *Atti Soc. Ven.-Trent. Sci. Nat.* pp. 16.

——. Pliocene subappenino ed ultimo periodo dell' èra cenozoica. [Subapennine Pliocene in the Latest Cainozoic.] *Ibid.* pp. 16.

Frič, Dr. A. Malá geologie čili nauka o vrstoách kůry zemské. [Geological Textbook.] Ed. 2. Pp. 169, 400 woodcuts. 16mo. *Prague.*

Geinitz, Dr. H. B. Das Elbthalgebirge in Sachsen. 2 Theil. Der mittlere und obere Quader. [Elbe Valley, M. and U. Quader.] *Palæontographica*, Bd. xx. Abth. 2, Lief vi. Würmer, Krebse, Fische, Reptilien, und Pflanzen. [Annulata, Crustacea, Fish, Reptiles, and Plants.] Pp. 199–236, 10 pls. (pl. ii. 37–46).
Continuation of work noticed in GEOLOGICAL RECORD for 1874, p. 299. Addition to Cephalopoda, p. 199. 7 Serpulæ, 4 Crustacea, 33 fish, 3 reptiles, 6 plants, and 2 sponges are remarked upon, none being new.
W. H. D.

Geyler, Dr. H. T. Ueber die Tertiärflora von Stadecken Elsheim in Rheinhessen, und über eine Flechte aus der Braunkohlen von Salzhausen. [Tertiary Flora of Stadecken-Elsheim, and a Lichen from the Salzhausen Lignite.] *Ber. Senckenb. nat. Ges.* for 1873–1874, pp. 14.
Notes the structure, range, &c. of several plants, and describes *Imbricaria Ziegleri*, n. sp.

Gray, Wm. Notes on the rudely worked Flints of Antrim and Down,—their character, distribution, and similarity to specimens

from England, Scotland, and the Continent. *Proc. Belfast Field Club*, ser. ii. vol. i. part 2, pp. 108–113.

These flints are found in surface-gravels; they cannot be separated into Palæolithic and Neolithic.

Grossart, Dr. W. On river Débris found in Sandstone. (*Glasgow Geol. Soc.*) *Coll. Guard.* vol. xxix. p. 419.

Gumælius, O. Beskrifning till kartbladet "Nora" (No. 56). [Description of Nora Sheet.] *Sver. Geol. undersökn.* Pp. 46.

See notice of map in the GEOLOGICAL RECORD for 1875, p. 369.

Hall, Prof. James. Descriptions of New Species of Goniatitidæ, with a List of previously described Species. *27th Ann. Rep. New York State Mus.* pp. 132–135.

Noticed from "advanced sheets" in GEOLOGICAL RECORD for 1874, p. 302.

Hall, Prof. James, and **R. P. Whitfield.** Palæozoic Fossils. *27th Ann. Rep. New York State Mus.* pls. 2–13.

Illustrate a paper in the 24th Report. See GEOLOGICAL RECORD for 1870, p. 303.

Hammerbacher. [Thallium in Carnallite.] *Sitz. phys. med. Soc. Erlangen*, Bd. vii. pp. 21–23.

The spectroscope shows thallium, cæsium, and rubidium chlorides in the Stassfurt carnallite.

Haniel, John. Die Schachtbohrarbeiten im schwimmenden Gebirge beim Schachte Nr. ii. des Concessionsfeldes Rheinpreussen bei Homberg. [Sinking in wet rocks near Homberg.] *Berlin.*

Hann, Dr. J., Dr. J. v. Hochstetter, and **Dr. A. Pokorny.** Allgemeine Erdkunde. Ein Leitfaden der....Geologie.... [General Treatise on the Earth.] Pp. xi, 393, 6 plates. 8vo. *Prague.*

Hoernes, Dr. R. Aufnahme im Quellgebiet des Rienz-Flusses. [Sources of the Rienz.] *Verh. k.-k. geol. Reichs.* pp. 238–240.

Hooker, Dr. J. D. Evidences of Ancient Glaciers in Central France. *Nature*, vol. xiii. p. 31.

Describes and figures transported blocks in the Tranteina valley, near Mont Dore. One is 36 feet long.

Issel, Prof. A. Saggio di una Teoria dei Vulcani. [Volcanic Theory.] *Florence.*

Kendall, J. D. The Hæmatite Deposits of Whitehaven and Furness [with Discussion]. *Trans. Manch. Geol. Soc.* vol. xiii. pp. 231–286, 288–304. See GEOLOGICAL RECORD for 1874, p. 372.

King, Prof. W. Oceanic Sediments and their Relation to Geological Formations. *Annals*, ser. 4, vol. xv. pp. 198–204.

Regards the production of the "red clay" of the deepest ocean-basins as due to sulphurous rather than carbonic acid.

Lahusen, —. [Cretaceous Clays of the Ssimbirsk.] *Scientific Collection of Papers of the Mining Institute of St. Petersburg*, vol. ii. p. 219.

Lasaulx, Prof. A. von. Roches Volcaniques de l'Auvergne. [Volcanic Rocks of Auvergne.] Translated by **F. Gonnard.** *Clermont.*

Lawley, R. Nota di conchiglie fossili di Val Lebiaja. [Fossils of the Lebiaja Valley.] *Bull. Soc. Mal. Ital.* vol. i.

——. Monografia del genere *Notidanus*, rinvenuti allo stato fossile del Pliocene subapennino Toscano. [Monograph of the Genus *Notidanus*.] 4 pls. *Florence.*

Notes 9 species from Pliocene of Pisa; of these, *N. Targionii*, *N. Meneghinii*, *N. d'Anconæ*, *N. problematicus*, and *N. anomale* are the author's species (? new). From notice in *Journ. Zool.* 1876. E. T. N.

Lehmann, Dr. J. Ueber Quarze mit Geradendfläche aufgefunden an einem vulkanischen Auswürfling. [Quartz-crystals in an Ejected Block.] *Sitz. nat. Ges. Leipzig*, Jahrg. 2, pp. 35–38.

Lefèvre [T.]. Un Gastéropode nouveau pour la faune Laekenienne supérieure. *Ann. Soc. mal. Belg.* t. ix. *Bull.* pp. cci, ccii.

——. Un Lamellibranche nouveau pour la faune Laekenienne inférieure. *Ibid.* p. ccii.

Lindsay, Dr. W. L. The Auriferous Quartzites of Scotland. *Scottish Naturalist*, April. 9 pp.

Linnarsson, G. Beskrifning till kartbladet "Latorp" (No. 55). [Description of Latorp Sheet.] *Sver. Geol. undersökn.* Pp. 41.

See notice of map in volume for 1875, p. 369.

Longuemar, A. de. Physionomie générale du territoire de la Vienne dans ses rapports avec sa constitution géologique. [General Features of the District of the Vienne with Reference to its Geology.] 4to. *Poitiers.*

——. Compte-rendu de diverses excursions géologiques dans les départements des Deux-Sevres et de la Vendée à la fin de l'an 1874. [Geological Excursions in Deux-Sevres and the Vendée.] Pp. 34. *Niort.*

Loriol, P. de, and E. Pellat. [U. Jurassic, Boulogne; Title in GEOLOGICAL RECORD for 1875, p. 392.] *Mém. Soc. Phys. Hist. Nat. Genève*, t. xxiv. p. 1.

Continuation of the work noticed, p. 346. Comprises the Lamellibranchs, Brachiopods, and Echinodermata. 274 species are described, mostly with figures. For the 63 new species see Index. W. H. D.

Lyell, Sir Charles. Abrégé des Éléments de Géologie traduit par M. J. Ginestou, avec un Tableau inédit des Fossiles anglais par M. Etheridge. [Abridgment of Lyell's Elements of Geology.] Pp. 896. 12mo. *Paris.* See GEOLOGICAL RECORD for 1874, p. 358.

Malafosse, G. de. Note sur deux Ammonites à conformation anormale du Lias de la Lozère. [Abnormal Ammonites from the Lozère Lias.] *Bull. Soc. Géol. France*, sér. 3, t. iii. pp. 270–272.

Mallet, R. Addition to the Paper on "Volcanic Energy: an attempt to develop its true Origin and Cosmical Relations." *Phil. Trans.* vol. clxv. pt. 1, pp. 205–213.

The same results being obtained by an independent and different method of investigation from that described in the original paper (Phil. Trans. 1873), are held to confirm the views there announced. W. T.

——. Note on Mr. Mallet's Paper on the Mechanism of Stromboli. *Proc. R. Soc.* vol. xxiii. p. 444.

Remarks that what the level of the bottom of the crater may be is immaterial to the validity of his theory. See GEOLOGICAL RECORD for 1875, p. 177.

Mantovani, P. Delle argille scagliose e di alcuni Ammoniti dell' Apennino dell' Emilia. [Slaty clay and Ammonites of the Emilian Apennines.] *Atti Soc. Ital. Sci. Nat.* vol. xviii. pp. 28–62.

——. Sulla Formazione geologica delle colline presso Ancona. [Geology of the Hills near Ancona.] *Corr. Sci. Roma*, Ann. xxvii. pp. 24, plate.

Manzoni, Dr. A. I Bryozoi del Pliocene Antico di Castrocaro. [Bryozoa of L. Pliocene, Castrocaro.] Pp. 64, 7 plates. 4to. *Bologna.* Imperfect notice in the GEOLOGICAL RECORD for 1875, p. 315.

Describes many species, of which 15 are new (see Index).

Martins, Prof. C. Recherches récentes sur les Glaciers actuels et la Période Glaciaire. [Existing Glaciers and the Glacial Period.] *Revue des deux Mondes*, April 15.

Matthew, G. F. Note sur les Mollusques de la formation Post-pliocène de l'Acadie. [Post-pliocene Mollusca of Arcadia.] Translated from MS. by **Arnaud Thielens.** *Ann. Soc. Mal. Belg.* t. ix. *Mémoires*, pp. 33–49, pl. i. See under **Vanden Broeck,** in GEOLOGICAL RECORD for 1874, p. 128.

Mayer, —. Osservazioni geologiche sulla Liguria, il Tortonese e l'Alto Monferrato. [Geology of Liguria, &c.] *Atti R. Ac. Linc.* ser. 2, vol. ii. p. 47.

Meneghini, Prof. G. [New Cephalopods, U. Lias, Italy. Title in

GEOLOGICAL RECORD for 1875, p. 316.] *Atti Soc. Tosc. Sci. Nat.* vol. i. fasc. 2, pp. 102–109.

Describes 7 new species of *Phylloceras* and 5 of *Lytoceras* (see Index).

Meunier, Stanislas. La terre végétale. [Vegetable Soil.] 18mo. *Paris.*

Moeller, V. v. [Geological Observations on the S. part of Nijni Novogorod.] 8vo. *St. Petersburg* (in Russ.). Continued in 1876, see p. 95.

Möhl, H. Die Basalte und Phonolithe Sachsens. [Basalt and Phonolite of Saxony.] *Dresden.*

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Gives a list of the species of *Dinornis* found in the Hamilton Swamp, province of Otago, N. Zealand.

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The preface, by **Des Cloizeaux,** states that the work describes all species well marked by their crystallographical, optical, and chemical properties, enumerating their varieties. Adam's classification is followed. W. H. D.

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Basalt is part of a series which, when well marked, was composed of (1) basalt, (2) pisolitic iron-ore, worked in Antrim, (3) bole, gradually passing into (4) lithomarge. Prismatic structure is the result of the contraction on cooling. R. B. N.

Prucha, Joseph. On the Use of Santorin Earth in the Construction of Hydraulic Works on the Sea Coast. *Stummer's Ingenieur*, vol. iv. pp. 248–265. (Abstract in *Proc. Inst. Civ. Eng.* vol. xlv. pp. 291–295.)

Santorin earth is composed of volcanic ashes. It is a coarse, sharp-grained, ash-grey powder, mixed with fragments of pumice, obsidian, and other substances. Analyses are given; also of Trass and Puzzuolana for comparison. W. T.

Rath, G. vom. Ueber die in der Nacht vom 29. zum 30. Marz d. J. in Skandinavien niedergefallene vulkanische Ashe. [Volcanic-ash rain in Scandinavia, March 29–30, 1875.] *Monatsb. k. preuss. Ak. Wiss.* pp. 282–286. See GEOLOGICAL RECORD for 1875, p. 219.

Raymond, R. W. Statistics of Mines and Mining in the States and Territories west of the Rocky Mountains. Seventh Annual Report. Pp. 540. 8vo. *Washington.*

Part i. Condition of the Mining Industry, with plans and sections. Part ii. Metallurgical; Rocky Mountain Coal, with analyses, pp. 430–433. Part iii. Miscellaneous; Geology of the Sierra Nevada in its Relation to Vein-mining, by **A. Bowman**, pp. 441–470, with maps and section. W. W.

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[A collection of essays, lectures, and unpublished notes.] Chap. I. *The Alps and Jura* (2 woodcuts, geological sections): a description of scenery and geological structure. II. *The Three Æras*: broadly speaking there are three great æras of the earth's history—those in which it was (1) crystallized, (2) sculptured, and (3) that in which it is now being deformed; illustrations given from Scotland, Wales, and the Alps. III. *Of Ice-Cream*: a description of glaciers, illustrated by plate i. (First conditions of Accumulation and Fusion in Motionless Snow). IV. *Labitur et Labetur*: movements of and denudation by glaciers and streams. V. *The Valley of Cluse.* VI. *Of Butter and Honey*: an exposition of Forbes's theory of glacier-motion. W. T.

Rutot, A. Note sur la decouverte de deux Spongiaires ayant provoqué la formation des grès fistuleux et des tubulations subleuses de l'étage Bruxellien des Environs de Bruxelles. [Perforated Sandstone due to Sponges in Brussels Eocene.] *Ann. Soc. Mal. Belg.* t. ix. *Mém.* pp. 55–68. See GEOLOGICAL RECORD for 1875, p. 220.

The name *Dysidea tubulata* is given to the sponge.

Sadebeck, A. [Crystallography.] *Sitz. Ges. nat. Freunde Berlin*, pp. 118–122.

Abstract of part of vol. 2 of Rose and Sadebeck's crystallography, in the press.

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Scudder, S. H. On Fossil Insects from Cape Breton. *Proc. Boston Soc. Nat. Hist.* vol. xviii. pp. 113, 114.

Notices wings of cockroaches and the "abdomen of a larval dragon-fly" (*Haplophlebium* ?) in the carboniferous shale.

Seue, C. de. Undersögelse af svartisen og temperaturforhold i enkelte af de Nordlandske fjorde. [On the Svartis-glacier and the temperature of some of the Northlandic fjords, Norway.] *Nyt Mag. Nat.* Bd. xxi. pp. 229–270, plate.

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Scrope, G. P. Note on Mr. R. Mallet on the Prismatic Structure of Basalt. *Geol. Mag.* dec. ii. vol. ii. pp. 412–414.

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Ireland has in past times suffered much from earthquakes.

Speyer, Dr. Oscar. Die paläontologischen Ein schlusse der Trias in der Umgebung Fuldas. [Triassic Fossils of Fulda (Hesse Cassel).] *Fulda.*

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Stephens, T. On the Discovery of Trilobites and other Silurian Fossils in Tasmania. *Monthly Notices R. Soc. Tas. for* 1874, p. 27.

Notices the occurrence of the genera *Phacops*, *Ogygia*, *Calymene*, *Conocephalites*, *Orthis*, and *Euomphalus*. No species are mentioned.

Sterzel, J. T. [Fossil Plants of the Rothliegende of Chemnitz.] *Ber. nat. Ges. Chemnitz*, Bd. v. pp. 71–243.

Stevenson, D. Notice of Striated Rock Surfaces on North Berwick Law. *Proc. R. Soc. Edin.* vol. viii. pp. 481–484.

States that "they present the usual two-fold glacial aspect of smoothly-ground undulating surfaces, indented by occasional deep striæ or scorings."

Stolpe, M. Beskrifning till Kartbladet "Riseberga" (No. 54). [Description of Riseberga Sheet (Swedish Geol. Survey).] *Sver. Geol. undersökn.* Pp. 29. See notice of map in volume for 1875, p. 369.

Stossich, M. Escursione sull' isola di Pelagosa. [Excursion to the Island of Pelagosa.] *Boll. Soc. Adr. Trieste*, vol. i. no. 6, October.

The rocks forming the island are:—1. Cherty limestone, with a coarse conglomerate or breccia derived from it. 2. Limestone, with many fossils (*Helix*). 3. Hard yellow conglomerate, with marine fossils. On the S. side of the island are gypsum deposits, associated with a clayey marl. G. A. L.

Struckmann, C. Ueber einige der wichtigsten fossilen Säugethiere der Quartärzeit oder Diluvial-Periode in Deutschland, mit besonderer Berücksichtigung des nordwestlichen Deutschlands und der Provinz Hannover. [Quaternary Mammals of N.W. Germany.] *Sitz. nat. Ges. Hannover*, and *Ber. nat. Ges. Hannover*, Jahrg 24.

Treats of prehistoric man and the contemporary mammals.

Symonds, Rev. W. S. Evidence of Glacier Action in Central France, *Nature*, vol. xiii. pp. 67, 68.

Refers to Dr. Hooker's remarks (see p. 356), and states that M. Lecoq has obtained remains of Marmot, Mammoth, and Tichorhine Rhinoceros from crevices in the lava of that district. C. E. D.

Taramelli, T. Dei terreni morenici ed alluvionali del Friuli. [Moraines and Alluvium of Friuli.] *Ann. Sci. R. Ist. Udine*, ann. viii. pp. 100. 2 plates.

——. Di alcune condizione stratigrafiche ed orografiche della provincia di Udine. [Geology of Udine.] Pp. 16. 8vo. *Venice.*

Traquair, R. H. On some Fossil Fishes from the neighbourhood of Edinburgh. *Annals*, ser. 4. vol. xv. pp. 258–268, pl. xvi.

Nematoptychius (n. gen.) is proposed for the *Pygopterus Greenockii* of Agassiz, chiefly from the form of the scales. The form and position of the fins also differ from *Pygopterus*. *Wardichthys cyclosoma* (n. gen. and sp.) is a new form belonging to the Lepidopleuridæ. The clavicle and pectoral fin of *Rhizodus* are described. The paired fins of this genus were obtusely lobate, and *Rhizodus* is separated by this important character from the acutely lobate *Holoptychius*, "with which it was so long and so obstinately confounded." L. C. M.

Urba, Dr. K. Die Grünsteine aus der 1000 Meter-Teufe des Adalbertschachtes in Přibram. [The Greenstone from the 1000-Metre Level in the Adalbert Shaft at Přibram.] *Vienna.*

Vimont, Edouard. Clermont, Royat, les monts Dôme, guide du voyageur, du naturaliste et de l'archéologue. [Guide to Clermont.] 18mo. *Clermont-Ferrand.*

Contains much geological information.

Vincent, G. Description de trois espèces nouvelles provenant de Wemmel (*Calyptræa sulcata*, *Voluta rugosa*, *Littorina lamellosa*). *Ann. Soc. Mal. Belg.* t. ix. *Mém.* pp. 51–54, pl. ii.

Virlet d'Aoust, —. Rapport sur les recherches entreprises sur le terrain houiller des vallées de l'Aumance et du Cher (Allier); Observations sur les recherches de houille du Rondet, commune de Montvicq, canton de Montmarault, arrondissement de Montluçon (Allier). [Report on Trials for Coal in the Coal Measures of Allier.] Pp. 14. 4to. *Paris.*

Walcott, C. D. Notes on *Ceraurus pleurexanthemus*, Green. *Ann. Lyc. Nat. Hist. N. York*, vol. xi. pp. 155–159.

——. Description of the Interior Surface of the Dorsal Shell of *Ceraurus pleurexanthemus*, Green. *Ibid.* pp. 159–161, pl. xi.

The normal position of this Crustacean is back downwards, swimming near the surface, nearly all found being in that position, with delicate organisms incrusting the back. Abundant in Trenton Limestone, Trenton Falls, Oneida Co., N. Y. W. H. D.

Waldegg, Ed. H. von. Die Kalk- Tiegel- und Röhrenbrennerei, in ihrern ganzen Umfange und nach den neuesten Erfahrungen. [Lime-, Brick-, and Pipe-burning.] 3 Aufl. 1 Theil. *Leipzic.*

Ward, John. Notes on the Fossil Trees in a Marl-pit at Hanley. *N. Staff. Field Club Papers*, pp. 80–86.

Wheeler, Lieut. G. M. Report upon Geographical and Geological Explorations and Surveys west of the One Hundredth Meridian. Vol. iii. On the Geology and Mineralogy. Pp. 681, 14 plates (views, sections, and map). 4to. *Washington.*

Part i. Report upon the geology of portions of Nevada, Utah, California, and Arizona, by **G. K. Gilbert**, pp. 17–188. Part ii. Geology of route from St. George, Utah, to Gila River, Arizona, by **A. K. Marvine**, pp. 189–225. Part iii. Geology of portions of Utah, Nevada, Arizona, and New Mexico, by **E. E. Howell**, pp. 227–301. Part iv. Geology of a portion of Colorado, by **J. J. Stevenson**, pp. 303–501. Part v. Geology of portions of New Mexico and Arizona, by **G. K. Gilbert**, pp. 503–567. Part vi. Investigations upon Mineralogical and Agricultural conditions in portions of Colorado, New Mexico, and Arizona, by **Dr. O. Loew**, pp. 569–661. W. W.

White, Prof. C. A. Report upon the Invertebrate Fossils collected in portions of Nevada, Utah, Colorado, Mexico, and Arizona, by Parties of the Expeditions of 1871–1874. *Rep. Geol. Surv. W. of 100th Meridian, in charge of Lieutenant Wheeler.* Vol. iv. Part i. Palæontology. Pp. 219, pl. xxi.

Describes 182 species of Invertebrata, of which 50 are new. Chap. 1 contains general observations upon the collections examined, and the periods which they represent; Chap. 2 is devoted to the systematic classification of the specimens reported upon. The remainder of the work is occupied with detailed descriptions of the fossils. The new species, including those briefly described in the preliminary Report (See GEOLOGICAL RECORD for 1874, p. 326) are distributed as follows (for names, see Index of Species):—From Primordial Rocks 7 (Plants, Brachiopoda, Trilobites). From Quebec Group 9 (Graptolite, Mollusca, and Trilobites). From Trenton Group 4 (Graptolites and Mollusca). From L. Carboniferous 5 (Echinoderms and Mollusca). From U. Carboniferous *Archæocidaris trudifer* and 7 Mollusca. From Jurassic 5 Mollusca. From Cretaceous, 13 Mollusca and *Serpula intrica*. From Tertiary 2 Gasteropods. *Lispodesthes*, a new genus, is founded for Gasteropods allied to *Helicaulax*, Gabb. H. A. N.

Winchell, Dr. Alexander. Michigan: being condensed Popular Sketches of the Topography, Climate, and Geology of the Strata.

Winkler, T. C. [Tertiary Fish.] *Arch. Ver. Freund. Nat. Mecklenb.* t. xxix. pp. 97–129.

The new species are *Odontaspis gastomensis*, *Notidanus Nettelbladti*, *Galeus Maltzani*, *Sphærodus Wiechmanni*, *Carcharodon Arndti*, and *Oxyrhina Kochi*. W. H. D.

Wolf, H. Quellgebiet des Sered und Umgebung. [Source of R. Sered.] *Verh. k.-k. geol. Reichs.* pp. 222, 223.

Wood, Major Herbert. On a probable change of the Course of the Amú Darya from the Caspian to the Aral. (*Imp. Geogr. Soc. Russia.*) *Nature*, vol. xi. pp. 229–232.

The silting up of the channel, due to the abstraction of water for irrigation at the time of greatest volume, has caused the stream to shift eastwards and enter the Aral. C. E. D.

Woods, Rev. J. E. T. Notes on the Physical and Zoological Relation between Australia and Tasmania. *Monthly Notices R. Soc. Tasm. for* 1874, pp. 42–52.

Contains geological notes.

Zesi, P. I caolini e le Argille refrattarie in Italia. [Kaolin and Refractory Clay, Italy.] *Boll. R. Com. geol. Ital.* vol. vi. pp. 299–320.

Describes many clays, giving analyses.

Zigno, Baron A. de. Einige Bemerkungen zu den Arbeiten des Herrn Dr. O. Feistmantel über die Flora von Rajmahal. [Feistmantel's "Rajmahal Flora."] *Verh. k.-k. geol. Reichs.* pp. 325–327.

——. [Fossil Sirenia, Venetia: title in GEOLOGICAL RECORD for 1875, p. 296.] Pp. 30, 5 pls.

Describes 4 new species—*Halitherium Bellunense*, L. Miocene; *H. angustifrons*, *H. curvidens*, and *H. Veronense*, M. Eocene.

——. Sui mammifere fossili del Veneto. [Fossil Mammals of Venice.] Pp. 16. 8vo. *Padua.*

Zincken, C. Die geologisch bestimmten Kohlen vorkommen excl. der Steinkohlen formation nach dem relativen Alter zusammengestellt. [Non-Carboniferous Coals.] *Leipzig.*

Palestine. Plate ii. of the Bible Atlas of Maps and Plans .... By the **Rev. S. Clark.** 4to. *London.* (Lithological, with 2 sections.)

Prussia. Geologische Karte von Preussen und den Thüringischen Staaten. Scale 1 : 25000. Gr. Abth. lxxx. Nos. 38–42.

Puy-de-Dôme. Plans-reliefs de la montagne du Puy-de-Dôme, coloriées l'un géologiquement l'autre topographiquement. [Relief Maps, one coloured geologically.] By **Edouard Vimont.** *Clermont-Ferrand.*