

riety of Dr. (Sir J. E.) Smith that, in one species of lichen, *L. exanthematicus*, found on limestone rocks in Yorkshire and elsewhere, *the saucers, when old, leave a cavity in the stone.* Linn. Trans. i. p. 81. Withering's Arrangement of British Plants, vol. iv. p. 19.

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NOTICES OF MEMOIRS.

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I.—ERUPTIVE ORIGIN OF GRANITE AND SERPENTINE IN ASIA MINOR.

**I**N the first volume of his "Geology of Asia Minor" (1867), M. de Tchihatchef records his observations on the eruptive rocks of that country. He advocates the igneous origin of granite, and as some discussion has arisen on this subject in recent numbers of the GEOLOGICAL MAGAZINE, a notice of M. de Tchihatchef's opinions may be of interest.

Under the collective term "Eruptive Rocks" the author ranges the following rocks, occurring in Asia Minor, which he considers to be of igneous origin:—Dolerite, Basalt, Melaphyre, Pyroxene, Porphyry, Gneiss, Granite, Granulite, Syenite, and Serpentine.

While advocating (with M. Naumann) the igneous origin of Gneiss, Granite, and Syenite, the author has had particularly in view these rocks as they are developed in Asia Minor, without wishing to deny the possibility of their different (metamorphic) origin in other parts of the globe. He further states that, although the metamorphic theory has received a support in the discovery by M. Sismonda of an *equisetum* in an erratic block of gneiss in the Alps, yet before generalizing on this phenomenon we must assure ourselves whether the gneiss of other countries furnishes arguments as conclusive in favour of this interpretation. But in Asia Minor, not only has nothing similar been discovered, but the gneiss is there found so intimately associated with the granite that one cannot but assign to the two rocks a common origin, and as the granite presents under more than one relation the character of an eruptive rock, he is of opinion that we must not separate one from the other until proof to the contrary is obtained.

The serpentinous rocks occur as agents of upheaval in enormous masses, intimately associated with the sedimentary deposits (Cretaceous and Eocene), and often intercalated among them. The eruptive nature of these serpentines is indicated by their action on the deposits with which they are found in contact, by the exterior aspect of the rocks themselves, as well as by the manner in which they are disposed.—H. B. W.

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II.—THE KEUPER FLORA OF NORTH TYROL. By Professor Ad. PICHLER.

[Proceed. Imp. Geol. Inst. Vienna, February 19, 1867.]

**T**HE vegetable remains are imbedded in a sandstone, which differs in no respect from the Keuper sandstone of Franconia. It belongs to the "Upper Cardita-strata," and is associated with argil-

laceous shales and marls, containing numerous remains of Mollusca (*Ostrea montis-caprilis*, etc.). The most abundant species of plants are—*Pecopteris Steinmülleri*, Heer; *Equisetites arenaceus*, Schenk; *Calamites arenaceus*, Jaeg; and *Pterophyllum Jaegeri*. The more locally-occurring species are *Pterophyllum longifolium*, *P. Haidingeri* (fine specimens with leaflets occasionally one and a half inches in breadth), and a species of *Pterophyllum*, with leaflets half-an-inch in breadth and very long, perhaps *P. Gumbeli*, Stur.—COUNT M.

III.—ZONE OF AMMONITES TRANSVERSARIUS.—Dr. Waagen has edited, and communicated to the Imperial Geological Institute of Vienna (Meeting, Jan. 5, 1867), a paper of the late Dr. Opper, concerning the Upper Jurassic Zone, characterized by the presence of *Ammonites transversarius*, limited above by the zone of *Terebratula impressa*, and below by the zone of *Ammonites cordatus*. The zone in question is to be traced from south-west Poland through the Carpathians, Moravia, Bavaria, the Schwäbische Alps, the Swiss Jura, the Alps, France, Spain, as far as Algeria. The number of fossil species known to occur in it amount to 217; among them are microscopic remains of Crustacea and Radiata, and many new species of Foraminifera.

IV.—MAMMALIAN REMAINS FROM HUNGARY.—M. de Hantken has recorded the following mammalian remains from a Post-Pliocene deposit at Fünfkirchen, in Hungary:—*Ursus spelæus*, many fragments of lower jaws, loose teeth, and vertebræ; *Hyæna spelæa*, Goldf., a fragment of a jaw belonging to a young animal, with the first teeth and protruding canines; *Equus fossilis*, Cuv., a fragment of a lower jaw with a tooth; *Bos priscus*, Boj., a second collar vertebra; *Rhinoceros tichorhinus*, Cuv., a single tooth.—*Proceed. Imp. Geol. Inst., Vienna*, Dec. 18, 1866.

V.—THE GASTEROPODS OF THE TERTIARY DEPOSITS OF PORTUGAL.  
By PEREIRA DA COSTA.

[Gasteropodes dos depositos Terciarios de Portugal, por Pereira Da Costa, com a versão Franceza por M. Dalhuny. 1o. Caderno, 4to. Lisbon, 1866.]

THE pages of this work are divided into two columns, one containing the original Portuguese of Señor Da Costa, the other a French Translation by M. Dalhuny, which will be very useful to those unacquainted with the Portuguese language. This first part contains 116 pages of letter-press and 15 excellent lithographic plates.

The author has followed Lamarck's classification in his description of the fossils, and explains that it is not through want of appreciating the great amelioration since introduced into the methodic distribution of the Mollusca, but on account of the great convenience in modelling the work on that of M. Hörnes, descriptive of the fossil Gasteropods of the Vienna basin, which being a deposit very similar to that in Portugal, contains the greater part of the species met with in Portugal.

The author also acknowledges the great assistance he has received from the works of M. Deshayes, and mentions the paper by the late Mr. Smith, of Jordan Hill, as the only work hitherto published on the Tertiary fossils of Portugal.

The author intends giving a summary of his results in the last part of the work, when all the species will have been described.

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## REVIEWS.

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I.—SANTORIN, THE KAIMENI ISLANDS. From observations by K. V. FRITSCH, W. REISS, and A. STÜBEL. (Translated from the German.) London, 1867. Trübner and Co. Folio. pp. 8. 3 Plates.

**M**UCH interest was excited during the early part of the past year by the announcements received in this country of repeated igneous outbursts having taken place in the Kaimeni Islands, a group of small volcanic islands situated in the Gulf of Santorin, formed by a large island of that name in the Greek Archipelago. From Greece, Germany, France, and England numerous scientific investigators repaired to study the nature of its phenomena. We have already (*GEOLOGICAL MAGAZINE*, 1866, Vol. III. pp. 222 and 263) given some account of these interesting observations and their bearing upon volcanic phenomena elsewhere. The authors of the present work furnish not merely an account of the changes produced by volcanic action in these islands, but, by means of maps and photographs from carefully executed relievo models of the islands themselves, they have laboured—and we think successfully—to convey to the mind a picture of the theatre of these disturbances and the changes produced both upon the island and the surrounding sea-bed. These island-volcanoes offer some interesting points of comparison with other volcanic areas. They appear also to confirm two important points in connexion with volcanic action. Firstly, that the volcanic cones of the Kaimeni islands, though differing in other respects, coincide completely with the cones of eruption of other volcanoes, and afford no support to the elevation hypothesis; secondly, here, too, as in many other localities, the craters already existing were not concerned in the later eruptions, the volcanic agencies mostly finding it easier to force a new passage for the materials thrown out, than to reopen the older ones.

Besides the three plates which accompany the description, the authors announce that four other explanatory maps and views of the Kaimeni islands may be obtained from Messrs. Trübner and Co. as a separate supplement to their work, giving the configuration of the island before the eruption and also on the 30th May, 1866, with the islands of George I. and Aphroessa in active eruption. This plate gives the best idea of the relation between the supra and sub-marine parts of the islands. They are greatly to be recommended for the use of geologists.