

earth of the Valley of the Nar, Norfolk. Specimen, No. 1.—Very muddy, grey clay, containing many molluscan shells (*Cerithium reticulatum*, &c.) and a few Otolites, in the small residue of the washing. This contains abundance of *Rotalia Beccarii* of all sizes, and also of *Nonionina striato-punctata*: the latter are small and delicate. No. 2.—Whitish, very shelly clay, leaving but little solid residue after washing. This is composed chiefly of broken fragments of Bivalves, and contains

Rotalia Beccarii; common.

Nonionina striato-punctata; common and small.

N. depressula; rare and small.

The whole of these Foraminifera are evidently from very shallow waters, possibly estuarine, or a few fathoms in depth, and resemble very closely some Oyster-ooze from the Firth of Forth.—T. R. J.

ABSTRACT OF FOREIGN MEMOIR.

THE TRIASSIC ROCKS OF CALIFORNIA.

FROM an interesting communication to the 'American Journal of Science,'* by Professor Whitney, on the progress of the Geological Survey of California, it appears that one of the most striking results of the Survey is the proof of an immense development, on the Pacific side of North America, of rocks equivalent in age to the Upper Trias of the Alps, and palæontologically closely allied to the Limestones of Hallstadt and Aussee, and the St. Cassian beds of the Alpine Trias. This Triassic belt of the Pacific Coast has been explored in the latitude of 40°, and east and west from 117 to 121 degrees of longitude; and from this region the largest portion of the fossils have been obtained, both from the three parallel ranges called the Humboldt Ranges, and from Plumas County, California. This formation extends from Mexico to British Columbia, occupying a vast area, although much broken up, interrupted, and covered by volcanic and eruptive rocks, and usually highly metamorphosed. Among the specimens collected, four species have been recognised by Mr. Gabb as identical with European forms; whilst the whole *facies* resembles that of the Hallstadt beds—the same intermixture of *Orthocerata*, *Ceratites*, *Goniatites*, *Nautili*, and *Ammonites*; together with *Hulobia*, *Monotis*, *Avicula*, *Pecten*, &c.; a *Monotis* being the most widely diffused and abundant of all.

Accompanying this Triassic formation in the Sierra Nevada, is an extensive development of Jurassic rocks, usually highly metamorphosed and extremely barren of fossils. The sedimentary portion of the great metalliferous belt of the Pacific Coast of North America is chiefly made up of rocks of Jurassic and Triassic age, with comparatively little of the Carboniferous Limestone. While, therefore, a large portion of the auriferous rocks of California consist of *Metamorphic, Triassic, and Jurassic strata*, there is no evidence

* See GEOLOGICAL MAGAZINE, No. 11, Vol. II., for May 1865.

(says Prof. Whitney) to uphold the theory that has been so often maintained, that all, or even a portion, of the Auriferous Slates are older than the Carboniferous; not a trace of a Devonian or Silurian fossil ever having been discovered in California. Indeed, gold, instead of being chiefly limited to Silurian rocks, occurs in no inconsiderable quantity in Metamorphic rocks belonging as high up in the series as the Cretaceous group (see also p. 330). With regard to the detrital auriferous deposits, they consist of materials brought down from mountain-heights above, and deposited in pre-existing valleys; beds of ancient rivers, and in lake-like expansions of former watercourses, during the later Pliocene epoch, and not at the Drift or Diluvial period, as is proved by the remains of the plants and animals imbedded in them. These auriferous deposits were succeeded throughout the whole extent of the Sierra Nevada by heavy accumulations of volcanic sediments, ashes, pumice, and finally by a general outpouring of lava, covering and concealing under hundreds of feet in thickness the auriferous gravels.

[The Hallstadt beds alluded to above, forming a subdivision of the South European Triassic group, are well developed in the Eastern Alps, and contain extensive beds of Rock-salt at Aussee, Hallstadt, Hallein, and elsewhere, which, wrought either by mining or by artificial brine-works,* yield an important item (about £7,000,000) to the Austrian Government. The fossiliferous limestone, lying above the salt-works at Hallstadt, is worked for marble, and has yielded a large series of characteristic fossils to the care and labour of M. Ramsauer, who has been also successful in his archæological researches in this district, and has discovered in the old cellarium of the salt-mines, the bronze pickaxes of the ancient people who worked the salt, it appears, about four centuries B.C.]—
J. M.

REVIEWS.

LE DARWINISME: OU, EXAMEN DE LA THÉORIE RELATIVE À L'ORIGINE DES ESPÈCES. Par A. L. A. FÉE. Paris, 1864.

DARWINISM, as the Theory of the Origin of Species by Natural Selection is sometimes, especially by theological adversaries, absurdly called, has in this author no very formidable opponent. M. Fée admits certain modifications of animal and vegetable forms, but recognizes no other influence in their production than that of a Final Cause. The extinction of certain anomalous forms is ascribed to the fact that Nature's ill-directed efforts having failed to adapt their organization to the circumstances under which they were placed, they have gradually succumbed to the destructive agencies by which they were surrounded, and have been removed from the earth by a natural process, not of selection, but 'deuration.' The author's right to pronounce upon the physiologi-

* Water, poured in from above, and left awhile to dissolve the salt, is recovered by pumping, and evaporated, after being led to a distance of many miles.