

The layer of fine gravel beneath the false-bedded sand was astonishingly rich in shells, most of which were fragmentary. Scarcely a handful could be taken up without observing them. Amongst them I identified the following:—*Cardium edule* (abundant), *Tellina*, *Mactra*, *Mytilus*, *Buccinum undatum*, and *Turritella terebra*. The stiff clay with pebbles was scarcely less rich in shelly fragments; only here the univalves were rare. It will be seen that these species are those commonly found in the Middle Drift sands, and the occurrence of chalk flints in such abundance, so far away from an outcrop of chalk strata, indicates some long-continued and general action.

VII.—GEOLOGY OF THE LINE OF THE GREAT PACIFIC RAILROAD.

THE following interesting communication relating to this wonderful line of Railway (forming part of a letter from F. B. Meek, Esq., of the Geological Survey of Illinois, U.S.A., to Dr. J. J. Bigsby, F.R.S., author of the *Thesaurus Siluricus*), has been forwarded to us for insertion by the kindness of Dr. Bigsby.

“In regard to items of Devonian Palæontology, it so happens that I have, just at this time, a few facts that may be of some interest to you. Mr. Clarence King, who has charge of a Government Geological Survey along the line of the Pacific Railroad, through from the Pacific, has submitted to me his whole collection of fossils for examination. As the party was in the field nearly three years, the collection is large, and includes fossils from various formations. Consequently I am only aiming, at first, to go over the whole in a general way, merely to determine the age of the rocks at various localities, after which I expect to give them a more thorough study. He has Devonian fossils from several localities a little east of Central Nevada. From his collections, obtained in the White Pine mining district, I have been able to determine that the great Silver-bearing rock of those mines belongs to the Devonian; though the Carboniferous is also well developed there. As these are very rich mines, that are yielding tons of silver, I have considered it a matter of some interest to determine the age of the rock. The specimens being mostly imbedded in the matrix, require some time and patience in order to work them out; and more critical comparisons than I have yet been able to give them, before I can speak positively in regard to all of the species. I can, however, give you, without doubt, the names of nearly all the genera, and of some of the species. They are as follows:—

“CORALS AND POLYZOA.—*Diphyphyllum*, *Syringopora*, *Smithia Hennahii* (Lonsdale), and *Acerovularia pentagona* (Goldf.), or very closely allied forms. *Chonophyllum*, very similar to *C. perfoliatum* (Goldf.), *Favosites*, *Alveolites*, and *Retepora*.

MOLLUSCA.—*Productus* (small, like *P. subaculeatus*), *Rhynchonella*, *Atrypa reticularis* (Linn.), *Spirifer Utahensis* (Meek),¹ *Spirifer Engel-*

¹ I originally described this under another name (*S. Norwoodi*), but on finding it pre-occupied, I afterwards changed it to *Utahensis*. [See Proceed. Philad. Acad., July, 1860, p. 308.]

manni (Meek), *Macrocheilus*, *Pleurotomaria*, and two species of *Orthoceras*.

I had, in 1860, referred this rock to the Devonian, on the evidence of some of these same fossils (and the absence of any Silurian or Carb. types), brought in, by Col. Simpson's Exploring Expedition, from another locality a little farther north, though at that time this rock was not known to be a silver-bearing formation.

In addition to several of the above-mentioned fossils, I had from this rock, in 1860, fragments of *Phacops*, *Homalonotus*, and of another fossil, I thought might be a *Calymene*, but I do not think now that it could have belonged to that genus.

It is highly probable that the silver-veins of this region come up from the Silurian, but no lower rocks than the Devonian have yet been found just there.

At other localities, farther east in Nevada, Mr. King found *Atrypa reticularis*, a *Spirifer*, and a *Dalmanites*, evidently Devonian types, and apparently from about the horizon of the Corniferous or Onondaga limestone of the N. Y. series.

From other localities he has *Ophilita complanata*, Vanuxem, and two species of those many-whorled depressed shells, often referred to *Euomphalus*, from a low position in the Silurian; also Primordial Trilobites. In West Humboldt range of mountains he obtained a fine collection from the Upper Trias, that afforded some of the same types figured in the California Report. These are as clearly of the age of the St. Cassian, as if the words "St. Cassian" were printed in Roman letters on every specimen. He also has Cretaceous and Tertiary Fossils. All the Tertiary yet known from this great internal region of the Continent, is of fresh or brackish-water origin. The Tertiary rests conformably on the Cretaceous, and the passage from one to the other seems to have been coincident with the change from marine to brackish-water deposits, which were afterwards succeeded by fresh-water formations."

"The information given herein was kindly permitted to be sent by Mr. Clarence King, Director of the Government Geological Survey along the line of the Pacific Railroad."—F. B. MEEK.

NOTICES OF MEMOIRS.

I.—ON THE SUBMERGED FOREST AT BLACKPOOL, NEAR DARTMOUTH, SOUTH DEVON. By W. PENGELLY, F.R.S., F.G.S.¹

IN a paper on the Submerged Forests of Torbay,² which I had the pleasure of reading to this Association, during the meeting at Tiverton, in 1865, I recorded the facts that a Submerged Forest existed at Blackpool, about two and a half miles south-west of Dartmouth; that it was almost always entirely concealed by the sand thrown up by the waves; that it had been described to me by

¹ Transactions of the Devonshire Association for the Advancement of Science, Literature, and Art. 1869.

² *Ibid.* vol. i, pp. 30-42.