

produces gas, since other factors have to be considered, as there stated; but, with the facts before us, it would certainly prove a great saving of capital in the search for gas, if operations were confined to the crests of the anticlinals; and I fail to perceive how Mr. Ashburner's fears for the 'misleading' character of my article can be realized.

I. C. WHITE.

Mountain-Lake Park, Md., July 11.

A rare dolphin.

On the 3d of June the national museum received from Messrs. Warren & Co., fish-dealers in Pensacola, Fla., a very beautiful and highly interesting dolphin, which was captured in the Gulf of Mexico. The upper surfaces of the body were dark slate-color, sprinkled with whitish spots about the size of a cent; while the under surfaces were white, spotted with dark gray. The species belongs to the genus *Prodelphinus*, — a genus closely allied to *Delphinus*, of which the dolphin of the ancients, *D. delphis*, is the type. Numerous species of *Prodelphinus* have been described from single skulls, but scarcely any thing is known regarding their external forms or relationships. The recent discovery of great schools of this spotted species in the Gulf of Mexico, and also, still more recently, by the U. S. fish-commission steamer *Albatross*, off the coast of North Carolina, gives the hope that we may soon be able to clear away the obscurity now resting upon the genus.

F. W. TRUE.

U. S. national museum.

The scenery of Arizona.

The unique character of western Arizona leads me to add a few words to the article of 'A. G.' in your issue of June 26. Only ignorance of the extreme attractiveness of this almost unexplored region explains the fact that so few tourists find their way thither.

My chief object in addressing you is to mention an easily made excursion from Flagstaff, fifty miles to the south, through Oak-Creek valley, and into the valley of Beaver Creek, to Fort Verde. Oak Creek is more like a White-Mountain stream than any other creek that I have seen in Arizona. The valley broadens to a considerable width, after dropping down a thousand feet or more from the mesa upon which the creek rises, and is enclosed by lofty bluffs of sandstone, the lower half of which is deep red, while the upper half is bright gray. The line of demarcation between these colors is remarkably distinct. These rocks, of mesozoic age, have been sculptured by eroding waters in the most wonderful manner.

This region is easily explored by following the trails on horseback. The rocks have not, of course, the sharpness and steepness of limestone mountains (the Alps, for instance); but it has never been my lot to view scenery elsewhere so graceful and picturesque. I feel at liberty to speak with enthusiasm on this subject, for none that visit Oak-Creek valley will come away disappointed.

R. SPAULDING.

Montclair, N. J., July 4.

The classification and paleontology of the U. S. tertiary deposits.

Although much tempted to make some comments on the remarkable statements of Dr. Otto Meyer relative to the south-western tertiaries, in his late article in the *American journal of science*, I had determined to keep silence until the second part of his work, presumed to contain the stratigraphical evidence he might have to present, should have appeared. In

view, however, of Heilprin's notice of the subject in the issue of *Science* of June 12, I desire to enter a caveat on both sides of the question, as one who has spent eighteen years, more or less, in the study of these formations. I emphatically agree with Heilprin as to the impossibility of subverting the cumulative stratigraphical evidence to the effect that the relative superposition of the several principal stages — the Burstone, Claiborne, Jackson, and Vicksburg groups — cannot be otherwise than as heretofore ascertained in hundreds of localities, by others as well as by myself; even supposing that the geographical distribution, with relation to the progressive elevation of the continent, could leave any doubt in the premises. I recall to mind that years ago I had occasion to repel a similar attempt, on the part of Mr. Conrad, to subvert the relative position of the Jackson and Vicksburg groups upon supposed paleontological evidence (see 'Remarks on the Shell Bluff group of Mr. Conrad,' in *American journal of science*, 1867). As Dr. Meyer seems to have been on the spot, and must have seen the Jackson strata disappearing beneath those of the Vicksburg group (if he ever descended Pearl River below Jackson), and the Claiborne and Jackson vanishing beneath the same and the Grand Gulf rocks (if he descended the Chickasawhay River), apart from what is proven by the exposures on the Tombigbee and Alabama rivers in the state of Alabama, his prediction that 'probably' the whole series might have to be turned upside down, is strongly suggestive of the periodic attempts to subvert the 'Copernican system' of astronomy.

Aside, however, from Dr. Meyer's stratigraphical vagary, I strongly sympathize with his views in respect to the transition of so-called species, mostly named by Conrad, from one of the stages to another; I repeatedly called Conrad's attention to the impossibility of maintaining a number of his distinctions, especially among the genera *Pleurotoma*, *Fusus*, *Voluta*, *Corbula*, *Venericardia*, and others; and finally, finding that every variation, clearly apparent to me as such, was by him interpreted as a new species, I ceased to send him fossils from the south-western formations, in order not to swell uselessly the already long list of spurious species. In a number of cases Dr. Meyer has observed and recorded precisely what I have long known to be the fact, — that oftentimes from two to five of Conrad's species are mere variations, easily recognized as such when the rich material is seen on the spot and in numerous localities. That Dr. Meyer has in all cases judged correctly, I am of course unprepared to say; but I emphatically hope that a critical revision of the tertiary and upper cretaceous fauna of the south-west will soon be made, with a view to what we have learned on the subject of evolution since Lea's and Conrad's time, and that the host of varieties now cumbering our tertiary check-lists in the guise of species will be reduced to something like a comprehensive view by a master hand. I doubt if there exists a finer opportunity for observing the evolution of marine species in tertiary times than is presented by the minutely differentiated formations of Mississippi and Louisiana.

E. W. HILGARD.

Berkeley, Cal., June 22.

The ginkgo-tree.

A large and remarkably fine specimen of *Salisburia adiantifolia* was in fruit on the Landreth estate, near Bristol, Penn., during September last, — an annual and by no means uncommon occurrence, according to the proprietors.

WINTHROP E. STONE.

Mass. ag'l exp't station, July 6.