

surface by consequence of change of shape from the level to the convex.

The *tunnel*, opening out at the butt of the Glacier on to the sea-beach, has doubtless been the main *outlet* for the *ground melting*, and its arched shape may also be deemed significant of the process of convexity adopted by the contraction of the Glacier from side to side.

The mechanism may be likened to the *curling in of the sides* of a piece of wood or paper when the flat side is exposed to the fire,—and it would be all the greater if the other surface were *damped*, just as the upper surface of the Glacier would be by the rainfall or snowfall of the season. Mr. Melvin's explanation of the formation of the *Parallel Roads* in Norway valleys may therefore be provisionally proposed to be applied to the phenomena of *other Glacier actions*, but there are many of these probably that have not convex roofs, nor ground tunnels like the Alaska Glacier. W. J. BLACK.

UNITED SERVICE CLUB, EDINBURGH, February, 1886.

EDESTUS AND PELECOPTERUS, ETC.

SIR,—I observe in your interesting article on the *Edestus Davisii*, in the January Number of the GEOLOGICAL MAGAZINE, that you refer to the genus *Pelecopterus*, Cope, as identical with *Ptychodus*, Agass. ; the pectoral spines representing the former being supposed to belong to the animal whose teeth have given origin to the second name.

My studies of these fishes have led me to entertain a different opinion from the above. *Ptychodus*, being a shark, is not likely to have a pectoral arch and fin like that of *Pelecopterus*. Moreover, these pectoral spines have been frequently found associated with the jaws and teeth of the "snout-fishes" of the Kansas Chalk, which have been described under the generic head of *Erisichthe*, Cope. Several species are known (see Bulletin U.S. Geol. Survey Terrs. iii. 1877), and one of them is probably the *Xiphias Dixoni* of Agassiz, from the Chalk of Sussex, England. These genera cannot be referred to any of the existing orders of fishes, on account of the peculiar structure of the pectoral arch. I have therefore placed them in an especial one, the *Actinopteri* (see Proceedings Amer. Assoc. Adv. Science, 1877(78), p. 299). E. D. COPE.

PHILADELPHIA, Jan. 26, 1886.

NOTE ON THE ABOVE, BY MR. W. DAVIES, F.G.S.

Professor Cope is, I think, mistaken in assigning *Xiphias Dixoni* to Agassiz. The name first appears in a paper by Dr. Leidy "On *Saurocephalus* and its Allies," in the Trans. Am. Phil. Soc. vol. xi. p. 91, where the name was given to the prolonged ethmoid bone referred by Sir Philip Egerton to *Saurocephalus lanciformis*, as then understood.

In that paper Dr. Leidy proves that the teeth assigned by Agassiz to the *Saurocephalus* of Harlan had no relation to that genus, and he refers the jaws and teeth from the English Chalk to a new genus ; under the name of *Protosphyæna*, Leidy. The "rostral" bones described by Sir Philip Egerton, he contended did not belong to

Protosphyrcæna, but to a species of *Xiphias* to which he gave the trivial name of *X. Dixoni*. Subsequently, Prof. Cope described his genus *Erisichthe*, which certainly embodies both of Leidy's species. I may mention here that the prolonged ethmoids are found in our Chalk, Upper Greensand, and Gault; and here also are found (and in no other deposit) the peculiar fin-rays referred to *Ptychodus* by Agassiz. From this association the inference is natural, that the ethmoids and fins belong to the same species of fish, viz. the *Protosphyrcæna* of Leidy, *Erisichthe*, Cope. (See paper by W. Davies, F.G.S., on *Saurocephalus lanciformis* of the British Cretaceous Deposits, with description of a new species, *GEOL. MAG.* 1878, Decade II. Vol. V. p. 254, Pl. VIII.)—W. D.

A MONUMENT TO HORACE-BÉNÉDICT DE SAUSSURE.¹

(BORN AT GENEVA, 1740; DIED 1799.)

SIR,—Chamounix is preparing to erect a monument in memory of our fellow-citizen H. B. DE SAUSSURE.

This memorial will be placed at the foot of Mont Blanc, whose lofty summit the illustrious savant indefatigably reached, not far distant from the Col du Géant, where, in pursuit of science, he encamped amidst snow and ice for sixteen days. In short, it will adorn the central position from which all the Alpine excursions of this intrepid explorer originated.

It is impossible to enumerate here all the titles acquired by De Saussure in the scientific world. Let us only remember that he was an eminent physician, a distinguished meteorologist, a charming writer, who devoted thirty of the best years of his life to the study of those Alps whose beauties he revealed with precision and poetic feeling, and as a conscientious and indefatigable investigator he became one of the founders of modern geology by placing that science on its true basis—*observation*.

The proposal to raise a monument naturally met with the most sympathetic support when it was presented to the members of the Alpine Clubs of all countries, who met at Chamounix in August, 1883, and at Turin in August, 1885.

Since then an Executive Committee has been formed, composed of Messrs. Folliguet (Mayor of Chamounix), Tairrez Payot, Thévenet, President, and Maillot, Secretary of the Mount Blanc section of the French Alpine Club, soliciting them to assist with their subscriptions the erection of a monument.

Switzerland and Geneva in particular would wish to be associated with the homage rendered to the merits of our eminent citizen. Above all, the people of Geneva ought to be interested in a monument designed to preserve the memory of a man who shed such lustre on our city and our ancient Academy. One knows, in fact, that in spite of his numerous travels and his absorbing scientific studies, he found time during many years to occupy a modest

¹ Among various writings, his most important work is the record of his Alpine observations: "Voyages dans les Alpes," in 4 vols. 1779-96.