

They are unaccountable to all of them. "They are not ant hills or animal burrows, and were not made by Indians."

I think the explanation is very simple and easily verified. The memories of the observers will confirm it. *They are the marks of up-rooted trees.* They appear in every part of our country where there are forests and where they have disappeared. They are more numerous in certain light soils and in swamps and sometimes in overflowed lands.

Trees blown down in gales turn up a large mass of earth, which as the tree and roots decay settle into low, generally oblong, 'knolls' or mounds. On the New England farm where I spent my boyhood was an old pasture that had many such mounds. It had been timbered with hemlock and some hard wood, which had been cut down and burned up to make 'a clearing.' A crop or two had been taken from it, but the soil was too thin and poor to pay for cultivating. It was given over to pasturage. I recognized their character from seeing them in process of formation in the adjoining woods. One autumn a tornado passed over the farm, cutting a swath through the forests. Every tree of any size in its path was either overturned or broken off. A few years ago I visited the old place. A new woods had grown up, but the track of the tornado could be traced by the little hillocks.

I lived at one time for some years in the pine woods of Mississippi, near the central part of the state, and there witnessed the formation of such mounds. It was more rapid than at the north. The annual fires in a year or two burned up the pitchy tree and roots and the mound was soon rounded up.

On the prairies of Iowa, where trees never grew, there are no such mounds. On the flood plains of the rivers that are usually timbered they occur, and in the valley of the Mississippi where I reside I have met with much larger ones than those of the uplands, large trees and a soft soil. I think, therefore, that this solution is very obvious and satisfactory.

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CLINTON, IOWA.

SPECIAL ARTICLES.

THE FISH GENUS ALABES OR CHEILOBRANCHUS.

NEARLY a century ago (in 1817) a group of eel-like fishes was named 'les *Alabès*' by Cuvier in his 'Règne Animal' (II., 235). All the information given was that they, like the *Synbranchi*, had a single undivided branchial aperture under the throat, well-marked pectorals with a small concave disk between them, a small operculum, three branchiostegal rays, pointed teeth, and intestines like those of the *Synbranchi*. Only one small species from India ('la mer des Indes') was referred to, but left unnamed.

This species ever since has remained unnoticed and unnamed till recently. In March, 1906, the concluding part of an article ('Le genre *Alabès* de Cuvier') by Leon Vaillant, published in the *Nouvelles Archives du Museum d'Histoire Naturelle* (4), VII., 145-158, was received, which throws some light on the subject. Vaillant identifies the genus with *Cheilobranchus* of Richardson. The alleged disk is so superficial that only a trace exists in some individuals and not at all in others, the so-called pectorals are rayless and approximately in the place of ventrals of many jugular fishes, the dorsal and anal are rayless, and the caudal has eight or nine ('huit ou neuf') articulated rays and is inserted around the margin of a hypural plate; there are intermaxillaries with imbricating ascending posterior processes and behind them small supramaxillaries; the teeth are compressed and blunt.

Such a combination of characters indicates a very peculiar type certainly not closely related to *Synbranchus*; Vaillant fully recognizes this and suggests (p. 156) that the genus is most nearly related to the Blennioidea and especially the Blenniidae. The latter view is very questionable, but not enough has been made known to permit an authoritative opinion to be formed. Vaillant has overlooked a couple of references including important or original data.

Henri Cloquet ('H. C.') contributed to the 'Supplement' (p. 99) of the first volume of the 'Dictionnaire des Sciences Naturelles,' an article on 'ALABES, *Alabes* (*Ichtyol*)' defining

it as a genus ('genre') in essentially the same terms as Cuvier had done but adding data respecting the intestines. The additional data, however, were simply taken from Cuvier's definition of *Synbranchus* on the assumption that what was true of the latter was also of the former. The date of the title page of the 'Dictionnaire' is 1816, the year previous to that of the title page of the 'Règne Animal' (1817).

Cloquet's notice is important inasmuch as Cuvier gave only the French form ('les Alabès') of the name which many naturalists of the present day would regard as inadmissible. Cloquet's addition of the Latin name is also prior to Oken's similar action (*Isis*, 1817, 1183).

A. Valenciennes furnished for the 'Dictionnaire Universel d'Histoire Naturelle' (I., 237, 1841) a notice of the genus *Alabes* defining it by the single jugular branchial aperture, small pectorals, small opercle, and three branchiostegal rays, ignoring the alleged disk. He also ignored the attribution of the Indian habitat, and referred to Péron as the collector — 'On ne connaît encore qu'une seule esp. de ce g., rapportée par Péron, lors du voyage du capitaine Baudin aux terres australes.' This solves the question as to habitat raised by Vaillant (p. 148).

I had long ago considered the possibility of the identity of *Alabes* and *Cheilobranchus* but the evidence was altogether insufficient to certify it, and had not the determination been effected by means of the types of *Alabes*, it might have been better to have rejected that name as indeterminable. As it is, it is perhaps necessary to revive it as the prior designation of *Cheilobranchus* and at the same time to substitute the family name ALABETIDÆ and the superfamily term ALABETOIDEA. In 1872, recognizing the decided difference between the genus and the Synbranchidæ, I proposed for it the family Chilobranchidæ and later (1896) further removed it from the Synbranchidæ as a superfamily (Chilobranchioidea). I have always regarded the group as having no determinate relationship to the typical Symbranchia and in 1872 retained it doubtfully among the

Apodes ('Apodes? incerti sedis'). In 1885 ('Standard Natural History,' III., 100), contrasting it with the true Symbranchia I have remarked, 'on the other hand, the Chilobranchidæ (a family of doubtful relationship) have only about twenty-one abdominal and fifty-two caudal vertebrae.' The data are still quite insufficient to determine the affinities of the genus but sufficient to assure us that it is not related to either the Symbranchia or the Blenniidæ. It is to be hoped that a comparative study of the skeleton may be made. It should above all be ascertained what is the nature of the paired 'fins' and for this purpose the morphology of the supporting bones (if any) should be elucidated.

THEO. GILL.

THE FUNCTIONS OF THE FINS OF FISHES.

THE communication in a recent number of SCIENCE (December 15, 1905) by A. Dugès, entitled 'Note on the Functions of the Fins of Fishes,' deserves some attention, if only to correct some of the impressions it leaves with the reader. While the observations recorded in the above-mentioned paper are interesting enough as evidence from one more source, it must not be thought, as the author states, that the functions of the various fins have not been 'treated in a practical manner up to the present,' nor is it true that the regeneration of the fins 'has not yet been observed, or at least not published.'

For the latter point I refer the author to the work of Professor T. H. Morgan on 'Regeneration in Teleosts'¹ and 'Further Experiments on the Regeneration of the Tail of Fishes,'² dealing with the results of experimentation on the regeneration of paired and unpaired fins in five genera, *Tautogolabrus* (*Ctenolabrus*), *Opsanus* (*Batrachus*), *Fundulus*, *Stenotomus* and *Decapterus*.

As to the use of the fins, H. Strasser published in 1882³ a good account of the move-

¹ *Archiv für Entwicklungsmechanik der Organismen*, X., 1900, pp. 120-134.

² *Ibid.*, XIV., 1902, pp. 539-561.

³ 'Zur Lehre von der Ortsbewegung der Fische durch Beugungen des Leibes und der unpaaren Flossen.'