

the temporal muscles (Owen, Anat., II, 93). Finding upon dissection of a young Cormorant the raphe but slightly ossified, I would make the following suggestion of its evolution. In some birds, especially those with small crania, the temporal muscles meet in the median line over the occiput. In the Cormorant we find this carried to an extreme, the muscles extending back for about an inch over the nape of the neck. This increase in the size, and consequently in the power of the temporal muscles, is evidently of great advantage to a bird of the Cormorant's habits. But were the muscles not held in place, they would slide over the occiput with the first contraction. This could have been avoided by the muscles being attached to the vertebræ, or to a theoretical ligamentum nuchæ. But such an origin would have bound the head in extension, a condition incompatible with the life of the bird. We therefore find the only other possible contrivance, a solid guy, extending from the cranium. This guy has been made by the conversion of the fibrous raphe into bone. In young Cormorants the raphe, though dense, is not ossified. Were the guy represented by a spinous outgrowth from the skull, motion of the head upon the neck would be seriously impaired, as the spine is fastened down to the neck by fascia and the skin. Therefore we find a ball and socket joint developed between the spine and the cranium.

This beautiful adaptation of limited material to a given end points strongly to a Lamarckian mode of development; its development by gradual selection is hard to understand. When we consider that demand upon a muscle leads to its increased size; that bone is frequently formed in tendons—and such the raphe is—to meet mechanical needs; that bursæ form in connective tissue at points of friction, we see how all may be the direct result of demand upon the temporal muscles. Once given the structure, natural selection comes into play in the increase of Cormorants; but first cause and the means by which the results of a first cause are maintained should never be confounded.

Finally, this bone, as the result of ossification of a common tendon of a pair of muscles, is an anatomical rarity.—J. AMORY JEFFRIES, *Boston, Mass.*

CORRESPONDENCE.

[Correspondents are requested to write briefly and to the point. No attention will be paid to anonymous communications.]

Trinomials Are Necessary.

TO THE EDITORS OF THE AUK:—

Sirs: Referring to Mr. Chamberlain's timely query, 'Are Trinomials Necessary?' in the January number of this periodical, I beg to say a word by way of supplementing Mr. Allen's excellent remarks upon this interesting question. He has covered the ground so well that, in heartily endorsing the tenor and substance of all he has said, I only wish to add

a formulation of the principle upon which 'the American school' acts in applying this method of nomenclature. The following paragraph is taken from a plate-proof of my new 'Key,' p. 76, long since stereotyped, but not yet published:—

"No infallible rule can be laid down for determining what shall be held to be a species, what a conspecies, subspecies, or variety. It is a matter of tact and experience, like the appreciation of the value of any other group in zoölogy. There is, however, a convention upon the subject, which the present workers in ornithology in this country find available; at any rate, we have no better rule to go by. We treat as 'specific' any form, however little different from the next, that we do not know or believe to intergrade with that next one; between which and the next one no intermediate equivocal specimens are forthcoming, and none, consequently, are supposed to exist. This is to imply that the differentiation is accomplished, the links are lost, and the characters actually become 'specific.' We treat as 'varietal' of each other any forms, however different in their extreme manifestation, which we know to intergrade, having the intermediate specimens before us, or which we believe with any good reason do intergrade. If the links still exist, the differentiation is still incomplete, and the characters are not specific, but only varietal, in the literal sense of these terms. In the latter case, the oldest name is retained as the specific one, and to it is appended the varietal designation: as, *Turdus migratorius propinquus*."

While it is always safer to prophesy after than before the event, I nevertheless venture to predict that the nomenclature of the near future will fully recognize some such principle as this, and apply it by means of trinomial nomenclature, in Europe as well as in America, and especially in Great Britain. In my judgment, the interests of the B. O. U. and of the A. O. U. would both be subserved by an alliance in this particular.

Very truly yours,

Washington, February 20, 1884.

ELLIOTT COUES.

Are Trinomials Necessary?

TO THE EDITORS OF THE AUK:—

Sirs: I feel sure that every amateur who has read the reply to my letter in the January number of this magazine will feel as sincerely thankful for it as I certainly do—grateful for the information conveyed, and pleased to have the proof that such questions as I have asked will receive kind and courteous consideration in the pages of 'The Auk.'

Candor compels me to add, however, that the reply has not, in some points at least, proved entirely convincing, and I return to the subject for the purpose of gaining further light.

It is to be hoped that the more advanced students will not grow impatient over the persistency and, perhaps to them, apparent stupidity of these unbelievers of the 'amateur element.' Those who have passed from unbelief to a firm conviction that trinomials are useful and neces-