that in the oak and pine woods at Bay St. Louis, Miss., on the Gulf Coast, the preceding species, excepting the Tennessee Warbler, were still present as late as May 10.

The character of weather that induces this delay sometimes persists in the latitude of New Orleans past the middle of May, so it is doubtful how late the migrants of the class referred to would be apt to linger. The extreme record so far established is May 15 for the Redstart and Bay-breasted Warbler. One of each species was seen on that date in 1902 at New Iberia, La., 125 miles west of New Orleans, on the edge of the fertile prairies of southwest Louisiana, in which region migration is noticeably later than at New Orleans. The lateness of this date is less surprising for the Redstart than for the Bay-breasted Warbler, as the Redstart has been found breeding in central and northern Louisiana. Audubon, however, records that he became acquainted with the Bay-breasted Warbler in a cotton field in June. I have never seen any explanation of this anomaly.— H. H. KOPMAN, *New Orleans, La.*

RECENT LITERATURE.

Mudge on the Tongue Muscles of Parrots.[1]— This paper contains a detailed and careful study of the muscles of the tongues of various species of Parrots and presents a scheme of classification based upon them and on the bones of the hyoid. Reference is made to the observations of others on the tongues of birds, but it might have been said that many of them, and especially the papers by Lucas, dealt with external modifications only. Nothing is said of these in the present memoir, so that we do not know whether or not Prof. Mudge attaches any value to outside characters, although we infer that he does not since *Trichoglossus* is not merely accorded no special rank, but is not even mentioned in the table of classification. The author states that his investigations show that the lingual muscles of the parrots are in the course of evolutionary changes, some of the muscles exhibiting the structural variations indicative of these much more markedly than others, and that the Loriidæ have advanced farthest along the road of specialization. He then pro-

[1] On the Myology of the Tongue of Parrots, with a Classification of the Order, based upon the Structure of the Tongue. By Geo. P. Mudge, A. B. C. S. Lond., F. Z. S. etc. Trans. Zool. Soc. London, Vol. XVI, Oct 1902, pp. 211–272, pll. xxvi–xxix.

ceeds to trace the various stages of evolution in the order of their probable occurrence, illustrating the conditions found in a large number of species by admirable figures. And it may be said that only one who has done similar work can fully appreciate the time and labor that this study must have entailed. At the end we are presented with a table giving a systematic arrangement of the divisions of the parrots defined by the characters offered by the lingual muscles and hyoid. By these the parrots are divided into three families, Loriidæ, Nestoridæ and Psittacidæ; and here the work of Mr. Mudge may be looked upon as confirming the views of those who have established the first two families on other characters. The Psittacidæ are subdivided into two 'Groups,' one of which contains only the Psittaculinæ and Pyrrhulinæ while the second consists of seven subfamilies comprising the vast majority of parrots. To a certain extent the geographical boundaries of the subfamilies agree with the anatomical limits, but we find *Caica* bracketed with *Pyrrhulopsis*, and *Platycercus* with *Bolborhynchus*, and the geographic unity is by no means conspicuous, as it is in the divisions of Gray's 'Hand List.'

It may, perhaps, be a mere personal prejudice, but the Australian region is so well marked ornithologically that it seems a little suspicious to see Australian and South American parrots placed in the same subfamily. Still every ornithologist is aware that no two schemes for the subdivision of the parrots agree in their minor details and that of Dr. Mudge is consistent in using the same class of characters throughout.

It would have been interesting to have compared the present arrangement with the results of Prof. Thompson's study of the cranial characters of parrots but, unfortunately, Thompson failed to put his results into definite shape and we are in the dark as to just what his ideas may be.

Some might perhaps urge against Prof. Mudge's classification that *Stringops* is not awarded a sufficiently high rank, being placed with other Australian species in the Cacatuinæ, but if *Stringops*, though specialized in some points is, on the whole, merely a cockatoo of generalized structure this association is what might have been expected on theoretical grounds.

Finally, it may be suggested, without in the least wishing to depreciate the most excellent work of Prof. Mudge, that it remains to be seen if an examination of the lingual muscles of any other division of birds will yield as good results as has been afforded in the present instance. The parrots, in structure and habits, are a remarkably homogeneous group of birds and it would seem that the differential evolution of their tongue muscles might be more uniform than in any other group, and consequently more available for purposes of classification.— F. A. L.

Winkenwerder on the Migration of Birds.— In the present paper[1] of

[1] The Migration of Birds, with Special Reference to Nocturnal Flight. By H. A. Winkenwerder. Bull. Wisconsin Nat. Hist. Soc., Vol. II, No. 4, Oct., 1902, pp. 177–263, with diagrams and other illustrations.