

Nichols on Some Aspects of Migration.¹— Those who are interested in speculating upon the origin of bird migration will find much food for thought in this short article of Mr. Nichols. Referring to the irregular southward migrations of the Red-breasted Nuthatch and other species of similar habit, he advances the theory that these movements are the result of a great increase in abundance within the permanent range of the species from which it then sweeps outward as it were in waves. We have all noticed how few Nuthatches return northward in the spring following an enormous autumn flight and Mr. Nichols explains this by the suggestion that the bulk of them are utterly dissipated and lost, and that only a small minority ever find their way back to their permanent range. This type of migration he terms 'centrifugal,' and considers it to be the original condition. Next comes the condition where the species has become so adjusted to conditions as to maintain itself in unvarying though comparatively small numbers, here there is overcrowding and consequently no migration at all. Then come species that retire from one part of their range to another during winter but never leave it entirely, simply adjusting themselves to changed conditions; this is 'intraspecific' migration; and finally an extension of this condition where the winter and summer ranges become entirely separated and the passage from one to the other constitutes the 'centripetal' migration so familiar in our spring and fall migrants where "highly developed homing instincts in the individual bird take the place of the futile centrifugal 'wanderlust' of the race in its initial condition."

The irregular movements of the Red-bellied Nuthatch and similar species have always been a puzzle to students of migration and the failure of food supply in their regular range never appealed to the reviewer as an adequate explanation. Mr. Nichols' theory on the other hand has much to commend it.

While his last three conditions and the development one from the other have been pretty generally recognized and will be generally accepted we do not think that he has been very happy in the selection of the White-breasted Nuthatch as an example of an absolutely resident species that does not migrate at all. Certainly in many places familiar to the reviewer it is much more abundant in autumn and winter than at other seasons. It may indeed be difficult to find a species in which there is not some migratory movement within its range.— W. S.

Birds of the National Parks.²— Three of the National Park 'Circulars of Information' for 1918 — those for Glacier, Sequoia, and Yellowstone

¹ An Aspect of the Relation between Abundance, Migration and Range in Birds. By J. T. Nichols. *Science*, August 16, 1918. pp. 168-170.

² General Information regarding Glacier Park, season of 1918 (*birds*, pp. 52-64); *Ibid.*, Sequoia and General Grant National Parks (*birds*, pp. 20-27); *Ibid.*, Yellowstone National Park (*birds*, pp. 61-66). National Park Service, Department of the Interior. Free on application to the Director of the National Park Service, Washington, D. C.