

The present status of the Heath Hen as revealed by the census taken during April (1923) and repeated in May indicates clearly that some action must be taken at once without waiting for the present study to be completed or else the opportunity may be gone for ever. The extraordinary decrease in numbers since 1920 can be explained only in part by unfavorable weather during the breeding season, poaching and other minor causes. From a biological point of view it seems that the great factor in this rapid decline is due to the excess males, an abnormal relation in numbers of the sexes, caused primarily by the fire of 1916. This condition did not manifest its effect immediately as might be expected, but if our analysis of the situation is correct, is now causing the destruction of the species. It is well known that rodents such as rabbits and rats may be exterminated by capturing the animals and freeing all males, a condition comparable to that now existing in our only colony of the Heath Hen. Furthermore gamekeepers in Europe especially in England and Scotland regularly kill the excess male birds in order to insure the vigor of the stock and the increase in numbers of individuals. The same method is now employed by certain persons in America who are attempting to propagate Ruffed Grouse and other gallinaceous birds on a large scale.

The Heath Hen, judging from studies of allied species, is probably polygamous and may practice polyandry (we hope the investigation may definitely establish the truth of this supposition). Among birds in which these conditions maintain the females are harassed during the entire breeding period with the result that irreparable damage is done to the eggs and young. The study of the Heath Hens thus far made, clearly indicate that the excess number of males is extreme. Consequently it seems advisable to trap as many of the males as possible, band them and keep them confined in large individual pens until the end of the breeding season. This plan if successful should be repeated each year until the readjustment has been accomplished.

This procedure may not be the means of saving the Heath Hen, but it is our last straw, and those in charge of the investigation feel that it may be a most important factor in helping the race to recuperate.

Yours truly,

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#### " Blue Feathers "

Editor of 'THE AUK:'

An article on "Blue Feathers" appears in the April number of 'The Auk' which purports to be a contribution to knowledge and presumably is to be judged by the standards which investigators are supposed to maintain in their publications. Furthermore, this paper is stated to represent work done on a grant for research from the "Heckscher Foundation for the Advancement of Research, Established by August Heckscher at Cornell University" (p. 275).

There is an appearance of recognition of literature, yet papers which cover a considerable portion of the material that the reader is apparently expected to consider original, are entirely ignored. The elaborate work of Kniesche<sup>2</sup> and of Spöttel is not mentioned nor are there any references to papers by myself which cover points made in the article. There is nothing new to science in the "conclusions," though this is where the more important original contributions of a paper are expected to be mentioned. On page 278, the following statement occurs. "It is generally recognized that white in feathers is a question of structure; but there seems to be no definite statement as to the exact mechanism and consequently a more detailed study has been made." No reference is made to two publications of mine<sup>4 5</sup> on this subject, nor is there any recognition of my statements<sup>6</sup> and figures concerning the blue producing structures of the Blue Jay and Bluebird on pages 280 and 284 where their structure is discussed.

Considerable attention is given to explaining the color of green feathers on pages 296 and 297 with no recognition of the more adequate treatment of the subject by Kniesche. The paper is a curious mixture of a partial recognition of work by other writers with numerous statements for which credit is not given and a small amount of new material.

There is a contribution from the experimental side in support of the theory first advanced by Haecker in explanation of the color of blue feathers. The production of turbid medium blue by a collodion jelly is interesting, though colloidal preparations giving turbid medium blue effects are not new. The polarization observations are, so far as I know, new, likewise the effects of pressure on the color of blue barbs. A list of papers dealing with the subject follows:

1. Bancroft, W. D., Chamot, E. M., Merritt, E., and Mason, C. W. Blue Feathers. *The Auk*, 1923, Vol. XL, No. 2. p. 275 to 300.
2. Kniesche, G. Über die Farben der Vogelfedern. I. Die Grünfärbung auf Grundlage der Blaustruktur. *Zool. Jahrbuch. Abt. Anat. und Ontog.* 1914, Bd. 38, S. 325-356. Mit Tafel 18-21 und 5 Abbildungen im Text.
3. Spöttel, W. Über die Farben der Vogelfedern. II. Die Färbung der *Columba livia* nebst Beobachtungen über die mechanischen Bauverhältnisse der Vogelfedern. *Zool. Jahrbuch. Abt. Anat. und Ontog.* 1914, Bd. 38, S. 357-426. Mit Tafel 22 und 70 Abbildungen im Text.
4. Strong, R. M. White Feathers. *Biol. Bull.* 1904, Vol. VI, No. 6. p. 311.
5. Strong, R. M. The Causes of Whiteness in Hair and Feathers. *Science*, N.S. 1921, Vol. LIV, No. 1398. Oct. 14. p. 356.
6. Strong, R. M. The Development of Color in the Definitive Feather. *Bull. M.C. Zool. Harvard*, 1902, Vol. XL, No. 3. pp. 147-185. 9 Plates. See p. 162 and Figs. 7 and 8, Pl. I.

Sincerely Yours,

R. M. STRONG.

Chicago, Ill.  
May 7, 1923.