

Only two successful matings of blond hybrid F_1 ring-doves *inter se* were made, as blond hybrid females were seldom obtained. The expectation for such a cross is given in the following formula. Males and females of both colors were obtained, but their composition was not tested.

5. Blond F_1 hybrid males		Blond F_1 hybrid females.	
composition			
	$B\delta (W\delta)$	$B\delta (W\delta)$	$B\delta (W\delta)$
producing gametes	$B\delta$	$B\delta$	$B\delta$
	$B_{rw}\delta$	$B\delta$	$B\delta$
	$W\delta$	$W\delta$	$W\delta$
	$W_{rw}\delta$	$W\delta$	$W\delta$
result: Blond males		Blond females	
$B\delta B(\delta)$		$B\delta B(\delta)$	
and also		and also	
$B\delta (W\delta)$		$B\delta (W\delta)$	
White males		White females	
$W\delta W(\delta)$		$W\delta W(\delta)$ and also	
		$B\delta W_{rw}(\delta)$ or	
		$W\delta W(\delta)$	

A more detailed description of the results which were obtained by the writer in crossing ring-doves has been prepared for publication, and a preliminary statement⁶ has appeared in this journal.

The interesting results, recently described by Cole,⁷ are easily explained by this scheme when we recognize that yellow, dun, red, etc., in pigeons are due essentially to less intense melanin pigmentations than that which is represented in black. The dun females in both of Cole's "Cases I. and II.," would then be due to conditions in the female-determining sperms of the recessive male (designated by subscript rw in the formula used in this article). The occurrence of red, yellow and dun in the offspring from the reciprocal cross is not surprising when the uncertain purity of domestic-pigeon stock is considered. Durham and Marryat compared their canaries on the basis of eye-color, as the numerous color variations of the plumage were less satisfactory characters.

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⁶ SCIENCE, N. S., Vol. 33, p. 266, 1911.

⁷ SCIENCE, N. S., Vol. 37, pp. 190-192.

FURTHER NOTE ON THE RESULTS OF OVARIOTOMY ON DUCKS

On July 26 of the present year, one of the ducks (No. 24, now three years old) on which ovariectomy had been performed as recounted in the *Biological Bulletin*, Vol. XX., No. 1, 1910, was killed and dissected. In my original report I stated simply that the bird was castrated, but made no statement concerning the completeness of the ovaries' removal. It is the purpose of this note to supply this lack. But before proceeding to describe the results of the autopsy, certain points should be briefly reviewed.

August 13, 1909, the *left* ovary was removed, no attempt being made to remove the right gonad, which it was assumed had completely degenerated. The duck was then 12 weeks old and already had the secondary sexual characters of the female which are distinct from those of the young male. For nearly a year afterwards this bird passed as an ordinary female. Then it was observed that a part of her feathers were like those of a male. At a moult soon after, she assumed still more of the male's characters, being in the condition shown in Fig. 11 of my earlier report. Subsequently, still more of the male's characters were acquired until her plumage was predominately, yet incompletely, male. For the last 18 months or so the plumage has remained in this intermediate condition, though several moults have occurred in the meantime.

At the autopsy no trace of an ovary on either side could be found. The only duct present was a well-developed but juvenile oviduct on the left side.

The other duck (No. 4), described in the paper referred to above, was examined through an opening in the left side on August 22. The site of the ovary was empty except for a thin strand of connective tissue. As far as could be seen from the left, the right side also was completely empty. This duck, operated on when nearly a year old, had laid several eggs in the period immediately preceding the operation. One was removed from the oviduct at the operation. She has developed only

a comparatively few feathers exactly like those of the male in full breeding plumage, the majority resembling, rather, those of the male in summer plumage.

In each of these cases, then, removal of the ovary has been followed by a greater or less assumption of male characters.

Further light on the subject may be expected in due course from the birds on which ovariectomy has been performed this season, several already having feathers like those of a normal male.

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NOTE ON A METHOD OF MIMICKING AMOEBOID
MOTION AND PROTOPLASMIC STREAMING
IN THE SAME MODEL¹

THE following method of mimicking amoeboid motion and protoplasmic streaming has been employed by me for class-demonstrations during the past five years. As it is extremely simple and yields results which are very striking and instructive, it appears advisable to communicate it to a wider public.

It is well known that if particles of camphor be dropped upon the surface of clean water they display energetic movements which are attributed to large and unequally distributed alterations in the superficial tension of the air-water surface at points of contact with the camphor.² It occurred to me, therefore, that if camphor could be incorporated into a fluid immiscible with water, drops of the mixture placed upon water might be expected to display surface deformations resembling those occurring in the formation of pseudopodia. This anticipation proved correct.

I prepare a ten-per-cent. solution of camphor-gum in benzol and then, since drops of this water-white liquid are difficult to observe upon the surface of water, I color it deeply by the addition of Sudan III or Scharlach R.

¹From the Rudolph Spreckels Physiological Laboratory of the University of California.

²Van der Mensbrugghe, cited after Rayleigh, *Proc. Roy. Soc. London*, 47, 1890, p. 64.

If a drop of this mixture be placed upon the surface of water, violent and extremely rapid deformations of surface are observed. Lengthy and irregular "pseudopodia" are rapidly thrown out and withdrawn. The whole drop exhibits a veritable ecstasy of motion which shortly ceases when a fine incrustation of precipitated camphor has spread over the water.

By successive additions of some viscous liquid such as olive oil to the mixture the motions of the drops can be rendered slower and slower and more readily followed in detail by the eye. When at length a mixture is formed of equal volumes of olive oil and the camphor-benzol solution the formation of "pseudopodia" is no longer observed; instead, we observe a prolonged and energetic streaming movement within the drop which mimics in the closest manner imaginable the phenomenon of protoplasmic streaming.

In this way the modifying influence of viscosity upon the reaction of fluid masses to local changes in superficial tension can be shown in any desired gradation; it appears probable that a superficial semi-solid pellicle must restrain the movement of the fluid in much the same way as internal friction. Hence, the phenomena of protoplasmic streaming and amoeboid motion are readily traced to the same origin.

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THE DUNDEE MEETING OF THE BRITISH
ASSOCIATION FOR THE ADVANCE-
MENT OF SCIENCE¹

THE meeting of the British Association at Dundee which has just come to an end will be remembered as one of the pleasantest and most successful in the annals of the association. It was thought to be impossible to surpass the number of members and associates who attended the last Dundee meeting, just 45 years ago; indeed, it was not expected that so high a figure would be reached. But the number this year—2,504—is considerably in excess of the total in 1867, and the support accorded to the association by every one in Dundee, from Lord Provost Urquhart to the humblest citizen, has been most gratifying.

¹From the *London Times*.