obvious that the approximation will be good for sufficiently small A and poorer for larger A. This is illustrated by counts of a group of population tables using first $A = 10$ and then $A = 100$, as shown in the tables. The expected numbers are calculated from Equation (9). In this case $A = 10$ is small enough for the agreement to be good ($P(> \chi^2) \simeq 0{\cdot}77$ on Pearson's test of goodness of fit), but $A = 100$ is not ($P(> \chi^2) \simeq 0{\cdot}0003$).

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Harvard University,
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Aug. 30.

[1] Benford, Frank, *Proc. Amer. Phil. Soc.*, **78**, 551 (1938).
[2] *Nature*, in the press.

Observations on Bird Behaviour

DR. K. G. BRITTON has recently described the behaviour of "a deluded sparrow"[1]. I can quote an almost identical case which happened some years ago. Early one summer morning I was awakened by a cock house-sparrow pecking violently at my bedroom window, which faced nearly due east. This was repeated the next morning. Between onslaughts at the window glass the sparrow clung to ivy which covered the deeply recessed sides of the window. This continued for a week, after which time the sparrow disappeared.

Dr. Britton draws interesting implications from the experiments and observations he made, namely, (*a*) mental maladjustment of the sparrow, (*b*) the possibility of intelligence well above the instinctive level. I should like to add collaborative examples of both postulates.

(*a*) *Mental maladjustment.* A hen blackbird nested in our garden and successfully reared two young ones. When these no longer required feeding, she continued for two or three weeks to offer food to any bird, adult or fledgling, that came near her. A young thrush accepted food, and once, when the blackbird offered a worm to an adult robin, it accepted this, whether from surprise or intention one cannot tell.

(*b*) *Intelligence.* The parents of a family of fledgling house-sparrows brought their young to feed on a supply of crumbs which we placed regularly on our verandah. When the parents ceased their care of the young sparrows, the latter continued to come by themselves. It was soon possible for us to recognize two individuals among them. One held its head on one side and the foot and leg of the other side were partly paralysed. The bird was timid, stupid and at a disadvantage. The second was a hen bird: in time we learnt to recognize her by slight individualities of proportion and colouring; but before this her behaviour distinguished her clearly. She took charge of the cripple, led it to food, and encouraged it by chirp and by suitable feeding movements. One day, as we sat very still in the lounge, with the door leading on to the verandah open, the young hen led her 'afflicted brother' through the door and across the floor to crumbs fallen under the table. She watched him feed and escorted him back to safety again.

It is usually stated that all bird behaviour is instinctive. Much of it can, of course, be adequately described by this term. It seems inadequate, however, to speak as though the whole of animal behaviour, vehicled through such diverse types of nervous systems, can be classified under one of two terms—instinct or intelligence. Such stultified and obsolete terminology has long since been advanced upon by the psychologist dealing with human behaviour. Human psychology has developed terms for all the grades of specific psychic* phenomena. In our opinion biologists are hampered by this paucity of psychological terms, a condition which tends to mask instead of to clarify the ideas at issue. No doubt fuller terminology has been developed by specialist workers, but nothing of the kind is used by biology or natural history at large.

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Exeter. Oct. 12.

* Using the word in its legitimate sense.

[1] *Nature*, **153**, 559 (1944).

WITH regard to the cock house-sparrow reported in *Nature* of May 6, 1944, as continually attacking its own reflexion in a glass window, a peacock of mine was a great nuisance because he would fight himself, in windows and the bright parts of cars. I have seen a cock house-sparrow attacking a window, and cases have been reported to me of a male blackbird, chaffinch, robin, dipper (at a house near a stream) and a grey wagtail doing the same. In all these cases the bird appeared to mistake its reflexion for a rival male trespassing on its territory and strove long and steadfastly to expel the intruder.

FRANCES PITT.
The Albynes, Bridgnorth. Dec. 3.

Wharton's Jelly Considered as a Conducting Path

IN connexion with the interesting discovery by Barcroft *et al.*[1] of the passage of molecules as large as serum albumin along the Wharton's jelly of the umbilical cord of the sheep, I beg to offer the following comments.

So far as the supply of nutriment (other than water) to the fœtus is concerned, in the late stage of development of the experimental specimens employed, namely, after the establishment of a fœtal vascular system and of its relation to the maternal endometrium, the transmission of large-sized molecules at a relatively slow rate along the Wharton's jelly may be considered to be only a minor method of nutritive supply compared with the rapid transmission of substances with smaller molecules by the blood stream. But the discovery of this function of the Wharton's jelly becomes of paramount importance, if we may postulate that, in the very early stages of development before angiogenesis has commenced, the primitive mesoblast, from which the Wharton's jelly is derived, has the same power to transfer large-molecule substances from the trophoblast (and hence from the endometrium) to the embryo. In this light, the early development of the primitive mesoblast in the monkey[2], and its even more precocious development in man[3,4], becomes of considerable significance.

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Nov. 30.

[1] Barcroft, J., *et al.*, *Nature*, **154**, 667 (1944).
[2] Heuser, C. H., and Streeter, G. L., *Contrib. Embryol. Carneg. Inst. Wash.*, **29**, No. 180, 15 (1941).
[3] Davies, F., *Trans. Roy. Soc. Edin.*, **61**, pt. II, 315 (1944).
[4] Davies, F., and Harding, H. E., *J. Obstet. Gynæcol. Brit. Emp.*, **51**, 225 (1944).