west, what has been pointed out concerning the fading of the rest of the sky, the comparative localisation of light and colour in the west, and the illusion as to brightness that occurs when the background fades, the phenomenon of Alpenglühen, and that of the greenish illumination so often seen, can be accounted for without the help of the startling hypothesis quoted.

But it would be more satisfactory if observations could be made from above. Would M. Vallot sacrifice himself and spend some nights up in the observatories that he directs?

R.N.E. College, Devonport. W. LARDEN.

The Positions of Retinal Images.

THE thanks of your psychological readers are due to Mrs. Ladd Franklin for having, in her letter published in your number of February 13, called attention to Schön's experiments, which, as she says, have been unaccountably overlooked. I have in consequence been repeating the experiment which Mrs. Franklin describes, but so far with purely negative results. Although some of the observers gave answers which might hastily have been interpreted as confirmations of Schön's illusion, a further analysis showed conclusively that no one on whom I have experimented, so far, perceived it.

Allow me to indicate one or two points in Mrs. Franklin's letter which seem to require elucidation. She writes as if the object looked at in the experiment "consists of a single bright point." But surely the point H in her diagram—the fixation point—was a bright point as well as O or O'? In Schön's experiments the apparent distance of O or O' was judged relatively to H (which was a stick of phosphorus), by the "stereoscopic (or pseudoscopic) effect," and his explanation of the illusion was that we (unconsciously) judge as if the image actually produced on the right retina had been produced on the left, and *vice versa*. The image on each retina consists of two bright points, but cannot strictly be called a "double image," since the bright points are produced by two distinct objects—by the phosphorus at H, and by the light proceeding from O' or O. If Schön's explanation is correct, then, supposing the light really proceeds from O', and when the ray O' *r'* is darkened appears to come from O, the observer ought to say the object appeared to be not merely as far off as H, but a *long way* behind it. Further, if the ray O' *l'* is darkened instead of O' *r'* there ought to be no illusion—he should say the object appears much nearer than H (*i.e.* still at O'); and if either ray is cut off altogether, he will have no reason for judging the object to be at O', but will probably judge it to be further back—where the source of light actually is. In my experiments, so far, none of the observers have made any distinction between cases where the ray O' *r'* was darkened and those where the ray O' *l'* was; but if either of them was darkened considerably, they answered just as they did when one of them was totally extinguished; judging the object to be about where the source of light actually was—which was about the same distance as the phosphorus mark H, and very much nearer than the point O would have been.

I hope to continue the experiments, if possible until I get a positive result, and should be glad therefore to hear some further details of Mrs. Franklin's experiments, especially with reference to the points I have brought forward, either privately or through your columns. EDWARD T. DIXON.

4 Cranmer Road, Cambridge, April 17.

Colour Variations in Ducks and Pigeons.

ABOUT a year ago you published a short article by Mr. Francis Galton (April 11, 1895, vol. li. p. 570), in which he urged the desirability of making careful records of all cases of "sports" sudden variations in domesticated animals, &c. Two such sports having arisen recently under my own observation, one in ducks and one in pigeons, I write to place the facts before your readers.

(1) *Ducks.*—In January 1894, I bought in Beyrout market a drake of the common "Mallard" colours and four ducks, two of normal wild-duck colour, one pure white, and one black, splashed with white. From these ducks I raised, the same season, thirty-six ducklings; and, from eggs given by a friend, nine more. Concerning the latter, nothing need be said at present, except that their own mother was of a very dark, dingy brown, and the ducklings were nearly black in the down. Of the thirty-six ducklings hatched from my own ducks' eggs, twelve or thirteen (I neglected to note the exact number at the time) were different in colour from their olive-green brethren and from anything I had seen before, being of a beautiful pale fawn colour above, shading into canary-yellow beneath, with darker pencillings and shadings on the sides of the head and back, and with the normal, symmetrical series of three pairs of light marks on the upper surface, distributed just as in normal, olive-green ducklings. The entire set of these pale ducklings proved to be females, and their plumage, when adult, was a pretty yellowish or sandy buff colour, with darker shadings, due to a brown streak down the middle of each of the contour-feathers. The speculum on the wing gave mostly sky-blue reflections, instead of the usual metallic green of common ducks. Two only of the dozen (or thirteen) differed perceptibly from the others, being of *uniform* cinnamon-brown colour, with white throats.

Five of these pale ducks were kept and allowed to breed, viz. one cinnamon-brown and four yellow ones. In addition, my stock during the season of 1895 consisted of three of the original old ducks (one white, one black, and one normal); three normal-coloured young ducks related to the pale ones (*i.e.* same paternity, and presumably same maternity to some extent); and two ducks raised from the eggs given by my friend, as above mentioned, and therefore non-related to the others—in all thirteen ducks. Of drakes there were four—two of normal mallard colour (related, as above, to the pale ducks), and two own brothers to the dark ducks, these having green heads and beautifully-pencilled stone-grey bodies, with no brown on the breast and no white collar—a departure from typical drake-colouration which is normal (in Syria at least) to dark varieties.

From this stock of ducks I raised last spring sixty-two ducklings, of which nineteen were fawn-coloured in the down. One of these died very young. Of the remainder, fourteen were females and four males. All were sandy-buff, none cinnamon-brown; but one—a female—was a shade or two darker than the rest, and when adult showed no metallic colours on the speculum, agreeing in this respect with the dark ducks of alien parentage.

Of greatest interest to me was the question: What will the "yellow" drakes be like when adult? Time has answered as follows: Head and neck, soft *coffee brown*, with obscure greenish reflections in some lights; narrow white collar; chestnut-brown breast, similar to mallard; upper tail-coverts (including curled feathers), and under-tail coverts, chocolate-brown; the rest delicate cream colour, with fine transverse pencillings on back and sides, similar to those on the mallard, but paler and less distinct: the whole effect very pleasing.

Of course all this may be familiar enough to some people, but it is quite new to me, and no mention of such drakes is made by Darwin in "Animals and Plants," nor by any other writer whose works I have been able to consult. Whether atavism has anything to do with the matter, I cannot say, as the parentage of my original stock is entirely unknown; but I am accustomed to notice very carefully all the ducks I see about town and the surrounding country, and am sure I have never come across any such during an experience of about twenty-five years. In any case, it is interesting to note that the new variety was far from being "swamped" by the inevitable crossing with its parent form.

(2) *Pigeons.*—In 1894 I procured a pair of birds of a variety known to Arab fanciers as black *Urjani* (or *Shamandarûzi*). These are largish pigeons, wholly black, with two "red" (*i.e.* bright reddish brown) bars on each wing, corresponding to the black bars on normal "blue" pigeons. The pair were unrelated, the male coming from Hums, the female from Damascus. The variety is scarce in Beyrout, and is valued more or less by all Syrian fanciers, who breed it with some care; and it habitually breeds true. My birds produced during the season of 1895 ten young ones: six (3 ♂, 3 ♀) quite normal in colour; one (♀) slightly mottled on the shoulders with brown and a very little white; and three (all ♀), which in the nest plumage were uniform *light red*. (I had not a red bird in the loft—scarcely a red feather, aside from the red bars of the *Urjanis* themselves, so there was no question of illegitimate paternity.) But, strange to relate, when these red birds moulted, nine-tenths or more of their red feathers were replaced by *pure white*, so that their adult plumage may be described thus: *white* birds with red neck, abdomen red mottled with white, a very few red feathers scattered over back and shoulders; no trace of red bars.

Careful inquiry among Arab fanciers having personal experience of the breed in question, elicited the following