Respiration and Emotion in Pigeons. JOHN E. ROUSE. Jour. of Comp. Neurol. & Psychol., 1905, XV., 494-513.

The chief value of the experiments under review is in the contribution attempted towards methods of control. Respiratory change is used as the index of psychical status, since this shows minute variations in stimuli and is easily recorded by the pneumograph. The support for the birds which were being experimented upon was a level horizontal board, in which an oval opening had been cut just large enough to admit the breast of an adult bird. In this opening the birds were secured in such manner that the breast projected through. A breast-plate with tambour connections was adjusted from below, thus permitting the curve of the sterno-vertebral breathing movements to be secured. The feet were held in place by tape fastened to hooks behind. A box covered the bird and the experiments were made with darkened room. An electric signal marker was used, which, writing beneath the respiratory line, automatically indicated the time of giving the stimuli. In the case of the visual tests this was rendered possible by using a double-contact key. A third pointer, connected with a metronome beating half seconds, showed the rate of the drum movement. The metronome was enclosed in a felt-lined box. The stimuli were pistol shots, bell ringing; odors of turpentine, ammonia, asafoetida, oil of bergamot, and lily of the valley; red, yellow, green and blue lights; lights of the same color, but of different intensities; concussions upon the table holding the support, and upon various parts of the room. Color preference was tested independently, by illuminating one half of the box containing the bird, with light of one color and the other half, simultaneously, with light of a different color. The lights were furnished by incandescent lamps, the glasses of which were differently colored. The four colors of the visual tests were employed in this experiment also. Each color was used successively with the three others and in every case the position of the bird with reference to the two lights was noted.

The principal results of the series of experiments are as follows: (1) All of the stimuli produced quickening in respiration and also changes in amplitude and contour of the curve. These changes were strongest in the case of concussion and sounds. (2) Those sounds which might be thought of as meaningless to the birds, such as pistol shots, very early lost their stimulating power, while much weaker but significant sounds, such as bird noises, retained their power. (3) No direct relation between intensity of light and the amount of reaction was perceived. (4) Agreement was shown between color preference

and the respiratory quickening caused by colored light. This was taken to prove concomitance between quickening of breathing and agreeable feeling.

The mass of entirely conflicting evidence hitherto discovered, which relates to the last conclusion, however, continues to stand and to negate the validity of the conclusion which the author rather emphatically gives it. The conclusion is rendered still more unwarrantable by the evident fact of the failure in the experiments herewith reported to exclude external and manifestly disturbing stimuli; and by the further fact that the number of records upon which the conclusion is based are comparatively few. A. A. FARLEY.

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Die Orientierung der Brieftauben. G. H. SCHNEIDER. *Zeitsch. f. Psychol. u. Phy. d. Sinnes.*, 1905, XL., 252-279.

In a note appended by the editor of the *Zeitschrift* to the above article, it is stated that Dr. Schneider had intended using the results there communicated in a second edition of *Der Thierische Wille*. Owing to the death of Dr. Schneider a second edition of this book was apparently never completed. It is impossible to make out from the article itself just when Dr. Schneider completed this work. He apparently began it in 1886. The author gives only five references to the literature—the most recent of the five bearing the date 1878. No mention is made in the paper either by the author or by the editor of the rapidly increasing modern literature on this subject.

The experiments are concerned mainly with the education of young carrier pigeons and with the short flights of adults. The question he sets out to prove is this: are the pigeons guided by an inborn sense of direction, which is unknown to us? Or are they guided by the eye? And if the latter supposition is assumed to be true, how are they influenced by topographical relations?

Dr. Schneider's method of experimentation was essentially like that adopted by all other investigators of the pigeon's behavior in distant orientation. The birds were transported in a basket by carriage or rail to the desired distance and were there released one by one. The time of the release, state of the weather, number and characteristic markings of the bird, were all carefully recorded. Trustworthy boys stationed at the côtes recorded the time of the return.

The experiments were made chiefly in and around Pössneck. The distances used were very short—from 3 km. to 42 km. Certain experiments were made to determine the relative ease of orientation between releases made in valleys and on mountains.