cortisone implanted varied somewhat from animal to animal, unabsorbed material was invariably observed at autopsy, and there was no correlation between the degree of inhibition following intrahypothalamic implantation and the quantity of hydrocortisone introduced. In most rats bearing pituitary implants more hydrocortisone was used than for animals that were implanted with hydrocortisone in the hypothalamus, and in the case of intrahypothalamic cholesterol implants, even larger amounts of this substance were utilized.

While this study was in progress, Endroczi *et al.* (*6*) reported that intracerebral injections of cortisone acetate in cats and rats inhibited acute stress-induced increases in adrenal venous corticoids when these injections were made into the ventral hypothalamus, or to a lesser extent into the midbrain. Since the hormone they injected spread over a considerable area, they concluded that the cortisone in the case of the hypothalamic injections had diffused to the pituitary and acted there. Our investigation, however, shows that hydrocortisone, when implanted directly into the pituitary, does not interfere with compensatory hypertrophy of the adrenal cortex after unilateral adrenalectomy, while similar implants into the hypothalamus result in adrenal atrophy. The fact that cholesterol implantation in the median eminence was ineffective suggests that our results indicate a specific inhibitory effect of hydrocortisone on an ACTH-regulating "center" in the hypothalamus (*7*).

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Higher Nervous Activity in Cats with Midpontine Pretrigeminal Transections

Abstract. In cats with midpontine pretrigeminal transections, orientation reflexes to visual stimuli consist only of vertical eye movements, pupillary dilation, and electroencephalographic arousal. Extinction of the orientation reflex by repetition of the photic stimulus is easily obtained; the reflex partially recovers after a few minutes of rest. By using as reinforcement stimulation of hypothalamus producing pupillary dilation and EEG arousal, conditioned responses to a visual stimulus may be obtained. The cat with midpontine pretrigeminal transection can be used as convenient preparation for the study of the orientation and conditioned reflexes.

Recent experiments (*1*) have shown that pontine transections in the cat, rostral to the entrance of the trigeminal nerve, are followed by low-voltage fast activity in the electroencephalogram (EEG). In the pretrigeminal transected animals, eye movements and pupillary dilation in response to visual stimuli were also observed. In the experiments reported here, orientation reflexes and conditioning were studied in the same preparation.

Only cats which breathed spontaneously and demonstrated good phasic reflexes and extensor rigidity were selected. Some animals showed permanent EEG sleep patterns, indicating that the level of the transection was too high. These animals were rejected. After undergoing surgery, the cat, still in the stereotaxic instrument, was placed in a small chamber. The background illumination was continuous. Pupils were constricted to a transverse diameter of about 1 mm. Two visual stimuli were used: a train of flashes and a rotating object. The strong background illumination produced fissurated miosis, so that no photic reflex to the train of flashes could be detected. Both stimuli lasted 2 seconds. The train of flashes was the conditioned stimulus. The conditioned stimulus was reinforced by electrical stimulation of the central hypothalamus, producing strong pupillary dilation and EEG arousal (*2*).

Each experimental session consisted of 10 to 20 trials, with intertrial intervals of 1 to 2 minutes. The interval between the onset of the train of flashes and hypothalamic stimulation was about 0.5 second at the beginning, and was gradually increased to about 5 seconds. The intervals between sessions were from 1 to 3 hours; however, after several sessions an 8-hour interval was always introduced. In some cats which remained in good condition for 3 or 4 days a number of sessions were conducted.

When the rotating object was presented for the first time, it usually produced a strong reaction, consisting of pupillary dilation (Fig. 1) and eye movement towards the stimulus. If the stimulus was given during EEG synchronization a desynchronization was also observed. The train of flashes produced a similar reaction, but it was always much weaker and sometimes absent. When the visual stimulus was applied repeatedly with short intervals (1 to 2 minutes) the reaction rapidly disappeared. The reaction reappeared spontaneously, however, after a period of rest of 5 to 10 minutes. This type of reaction, with rapid habituation and spontaneous recovery, suggests that we are concerned here with the ocular components of the orientation reflex.

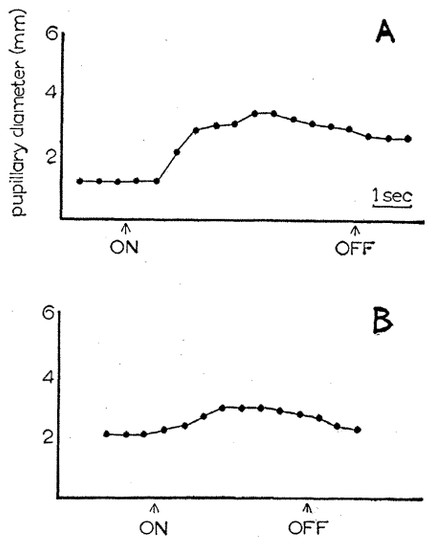

Fig. 1. Pupillary responses to rotor (*A*) and train of flashes (*B*).

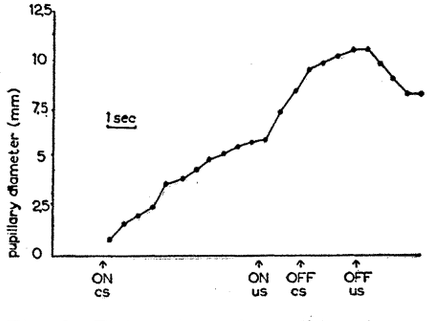

Fig. 2. Elaboration of conditioned mydriasis to the trains of flashes. Strong pupillary dilation to the train of flashes in the first trial of the 11th experimental session.

When the train of flashes was reinforced by hypothalamic stimulation, the reaction increased if previously present, or appeared if it had been absent. After several sessions the reaction became constant and at times very strong (Fig. 2). On trials in which only a train of flashes were presented the pupillary diameter remained unchanged.

In two cats the rotating object was presented the same number of times as the train of flashes, the rotating object without reinforcement and the train of flashes always reinforced by hypothalamic stimulation. At the beginning of the experiment the rotating object produced a strong reaction, while no pupillary dilation was observed in response to the flashes.

The response to the rotating object decreased gradually, however, and after several sessions became completely or almost completely extinguished (habituation of the orientation reflex). In contrast, conditioned responses to the train of flashes appeared because of systematic reinforcement by hypothalamic stimulation. This experiment shows that the increase or the appearance of a mydriatic response to a train of flashes followed by hypothalamic stimulation cannot be attributed to unspecific activation of the orienting reflex (pseudoconditioning), but represents true conditioning.

Our results show that a healthy pretrigeminal preparation possesses neural structures lying above the transection adequate for classical conditioning and habituation processes. The preparation may be useful for further study of these phenomena. Of course, the experimental possibilities are severely limited by the striking reduction of sensory and motor paths available. However, this preparation has the following advantages in comparison with the intact animal: (i) immobilization simplifies observation and recording of reactions, (ii) the absolute lack of pain permits surgical intervention which would otherwise require anesthesia or interfere in other ways with the conditioned response, and (iii) the isolated cerebrum provides a simpler background for experiments.

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Conditions Influencing Vocal Responsiveness of Infant Chimpanzees

Abstract. Infant chimpanzees were tested to determine the effects on distress vocalizations (whimpering, screaming) of stimulus conditions approximating the physical relationship to the mother. Under such conditions spontaneous vocalizations were infrequent, and vocal responsiveness to a painful stimulus was substantially reduced.

The infant mammal's first and probably most important contacts with the external environment occur with the mother. For the newborn chimpanzee, the maintenance of an adequate physical relationship to the mother is essential to survival in the wild and the achievement of this relationship is based on reciprocal adjustments between mother and infant. The initiative in cleaning the neonate, placing it near the breast, and supporting it in this position is taken principally by the mother (*1*), while the infant, by virtue of behavior mechanisms functioning shortly after birth, participates by grasping the mother's coat, by making searching movements which facilitate the location of the nipple, and by sucking. If for any reason an adequate adjustment should fail to occur, the infant usually evidences heightened responsiveness expressed in increased motor activity and whimpering or screaming.

This report is concerned with the general problem of the relationship between infantile responsiveness and conditions of maternal stimulation. Specifically, it examines the effects of various patterns of cutaneous stimulation on distress vocalizations (whimpering, screaming).

The subjects were three female chimpanzees (Bandi, Cari, and Flo) separated from their mothers at birth and housed individually. In the first experiment each animal was tested three times a week during the first 8 weeks of life. Fifteen test conditions were presented in each session, each condition consisting of 30 seconds of continuous stimulation.

Table 1 shows the results for eight test conditions which are particularly relevant to this report. The data in the first two columns were obtained with the subject in the supine position on the test table, and a comparison is made of vocal responses to ventral stimulation produced by light tickling, rhythmic stroking, continuous light pressure (palm of hand), a 5 by 11 inch cylinder loosely covered with terry cloth, and the bare table (no ventral stimulation). The data in the second two columns compare responses when the subjects were in the prone position on the bare table, on the table loosely covered with terry cloth, and on the cylinder (*2*). The results clearly indicate that stimulation by the cylinder, which most closely approximates the subject's normal physical relationship to the mother, was the most effective stimulus in reducing vocalizations (Friedman test, $p < .05$).

Further information on the nature of this effect was provided by two subsequent experiments, each comparing responses to shock to the foot when the infant was held (ventral surface firmly against the experimenter's chest) and when it rested on a bare surface (table, or floor of living cage). The first experiment started when the subjects were between 109 and 115 days of age and was completed in two sessions. Each session began with the shock at 2.00 ma, and the subject received ten shocks (2 seconds duration, 2 seconds apart) in one of the two experimental conditions (held, not-held),

Table 1. Mean duration of vocalization per session (in seconds), and percentage of sessions in which vocalization occurred. Based on twenty-four, 30-second test sessions per subject. The stimuli are given in italic type.

Supine		Prone	
Duration	% of sessions	Duration	% of sessions
Tickle			
6.9	69.4		
Stroke			
3.1	37.5		
Pressure			
4.0	44.4		
Cloth			
		1.0	29.2
Bare table			
2.0	38.9	5.7	63.9
Cylinder			
0.6	12.5	0.5	9.7