The aim and method of the present work are similar to those described previously in Communication I [3]. The difference was only that previously we investigated in the rat the effect of extirpation of the temporal cortex, and in the present instance it is the occipital region which was removed.

FIRST SET OF EXPERIMENTS

Changes in Positive Conditioned Reflexes (to a Bell and to Light) After the Operation. The work was carried out on 12 rats aged 5 months. The reflexes became fairly stable after 20-25 experiments. To obtain more stable reflexes we carried out a further 25-35 experiments. Before the operation, the animals responded correctly on 90-100% occasions to positive stimuli (bell and light) and gave 85-95% correct responses to the negative signals (intermittent bell and intermittent light). There were two deaths from the operation.

In the first experiment (five days after the operation) there was no reflex response to sound in three of the rats, and none to light in six. The positive conditioned reflex to light had been weakened more than the response to sound. The response to the light developed before the response to sound; in three rats the time difference was four days, and in two it was 1-2 days (Fig. 1). In the remaining animals, although the conditioned reflexes to light and to the bell recovered simultaneously (on the fifth day after operation), there were fewer correct responses to the light than to the bell. One rat gave four correct conditioned responses during the whole post-operative period, and all were to the

A) Experiment No. 5

B) Experiment No. 6

C) Experiment No. 16

Fig. 1. Conditioned reflex activity of rat No. 10 after removal of the occipital cortex. 1) Defensive conditioned reflex; 2) conditioned stimuli: b—bell, ib—interrupted bell (differentiation); l—light, il—interrupted light (differentiation); 3) unconditioned stimulus (electric current); 4) time marker (two seconds).
Fig. 2. Disinhibition and increase of activity in rat No. 12 at an early period (a and b) and three months (c) after removal of the occipital cortex. Indications as in Fig. 1 (each notch indicates the passage of the rat from one half of the enclosure to the other).

bell. Only in one rat was there no change in the conditioned reflex to light or to the bell, but the negative conditioned reflex to the light was weaker in this animal than was the corresponding reflex to the bell.

The positive conditioned reflex to light was completely restored to the preoperational level by the 17-20th day after operation, and in some rats it was restored by the 7th or 15th day. In general, the conditioned reflex to the bell reached the preoperational level by the 10th day, and in some rats this level was reached by the 5th or 7th day after the operation.

Differentiation to light was impaired more than to the bell; the former recovered later (on the 6th day in one rat, on the 4th day in one, and on the 1-2nd day in five). In two rats no difference was noted in the differentiation as between light and bell.

Relative recovery to the preoperational level of the conditioned response to the light differential stimulus was observed in two rats, and it started on the 12th day after the operation. Differentiation to the bell recovered to the same level in five rats on the 6th-9th day after operation. In the remaining animals there was no recovery of the differentiation to the light or to the bell. A strong disinhibition of the process of differentiation was found to last for the 2-4 days immediately following recovery of the positive reflex, and then disinhibition was frequently repeated in the succeeding experiments (Fig. 2).

After a break of 36 days, the positive conditioned reflexes to light and bell were as strong as they were before the operation. But there was a severe disturbance of differentiation (Fig. 2, c). During this period there was no difference in the conditioned reflex activity (positive and negative reflexes) to light and bell.

After the operation, in many rats we observed an increased spontaneous activity. The number of times the rats passed from one half of the room to the other during the experiment in between signals compared with the number of times they did so before the operation was increased two-fold in the immediate postoperative period, and three-fold in the third month after the operation; the mean figures were: before the operation 2.1 transitions, after the operation 4.1, and in the third month 7.7 transitions (see Fig. 2).

SECOND SET OF EXPERIMENTS

Change in conditioned-reflex elimination of different kinds of reflexes after the operation. In seven rats we developed initially defensive conditioned reflexes to a buzzer and to light, and next feeding conditioned reflexes to the same stimuli. After these reflexes had become established, we elaborated their