Summary

Many investigators in the past have demonstrated that learning and memory processes are enhanced by amphetamine. The common explanation given for this is that amphetamine acts on brain catecholamines in some way to produce the observed enhancement. Amphetamine enhancement may be related to adrenal medullary function. This suggestion was based on the findings that peripheral administration of amphetamine enhanced retention. So it can be said that amphetamine has a primary site of action in the periphery. (Martinez, 1980; Martinez and Vasquez, 1980).

Keeping in view the enhancement and inhibition of retention by amphetamine and phenobarbitone respectively the following three hypotheses were formulated:

(1) Post-training administration of adrenergic agonist (amphetamine) would facilitate the retention.

(2) Post-training administration of adrenergic antagonist (phenobarbitone) would impair the retention.

(3) Post-training administration of the combination of amphetamine and phenobarbitone would not effect the memory in any way.
For testing the hypotheses, a multi group design was employed.

A sample of 40 albino rats of about 90 days old weighing between 100±30 gms were selected randomly from the rat population of the animal house, Department of Psychology, Rohtak.

The animals were trained on a single trial passive avoidance task in Jumping box: Four groups of rats were taken. Immediately after training, Group I received an ip injection of amphetamine (1 mg/kg), Group II was injected with phenobarbitone (12 mg/kg ip), Group III was given a combination of amphetamine (1 mg/kg) and phenobarbitone (12 mg/kg) but control group received an ip injection of 25 ml of 9% NaCl.

Retention tests of all the groups were taken after 24 hours and 48 hours of training.

Duncan's Range Test was employed in order to test the significance of differences between the mean latency scores.

To test the significance of differences between
turning periods of various groups, Sandler's A test was employed.

All the three hypotheses were verified by the present findings that memory facilitation was observed in amphetamine induced group but in phenobarbitone group memory impairment was observed. Whereas third group given combined treatment of amphetamine and phenobarbitone showed the same results as that of placebo group.

So it can be concluded that amphetamine, by acting on the catecholamines, releases the norepinephrine and dopamine, which is responsible for the enhancement of memory.