VIII. SUMMARY AND CONCLUSIONS

1. The present work has been carried out mainly to find out the effect of CCl₄ on certain biochemical compositions of the body constituents of the two rodents

a. The Indian Gerbil (Tatera indica Hardwicke)

b. The House Rat (Rattus rattus Linnaeus)

a. The Indian Gerbil (Tatera indica)

The gerbil commonly known as Indian desert rat is found to occur in Rajasthan both in the desert as well as in the vicinity of human habitats. The gerbil is mainly a herbivore. It is quite dangerous as a carrier of human diseases particularly the plague. It lives in burrows and nocturnal in habit. The adult weighs more than 70 gm.

b. The House Rat (Rattus rattus)

This animal is known to live in intimate association with men in burrows, thatched roof, cropfield etc.; very common in Rajasthan. The food is varied and feeds on grains, vegetables as well as cooked food.
The house rat leads a nocturnal life. The adult weighs more than 70 gm.

2. A quantitative estimation of the following biochemical components has been made to elucidate the effect of the administration of CCl₄ at the end of 24 hrs (1 day) and 120 hrs (5 days) respectively in the above mentioned rats.

A. The blood constituents
   i. The blood sugar
   ii. The blood cholesterol
   iii. The blood phospholipid
   iv. The total plasma protein
   v. The plasma albumin
   vi. The plasma globulin

B. The liver constituents
   i. The liver glycogen
   ii. The liver cholesterol
   iii. The liver phospholipid

1. The blood sugar

The amount of blood sugar which in a normal Indian gerbil, is 86.77 mg/100 ml showed a steep rise after 24 hrs of treatment with CCl₄. Thereafter
also a gradual rise was registered and at the end of 120 hrs it rose to 161.86% of the normal level.

In the House rat on the contrary a decline was registered 24 hrs after the treatment with CCl₄ by 9.26%. A slight rise was noted thereafter. Yet at the end of 120 hrs the component was still below the normal level i.e., 96.06% of the normal value.

ii The liver glycogen

The normal glycogen level was 438.92 mg/100 ml in the Indian gerbil and 276.53 mg/100 gm in the House rat. After 24 hrs in CCl₄ treated rats, the liver glycogen showed a marked decrease and the level came down to 54.60% of the normal value in the Indian gerbil and 77.77% in the House rat. Thereafter an increase was noticed in the Indian gerbil and the composition at the end of 120 hrs was 78.89% of the normal level. Thereafter, in the House rat there was very slight change in the glycogen level and it was 78.22% of the normal value at the end of 120 hrs.

iii The blood cholesterol

The concentration of blood cholesterol showed a
marked decrease in both the species of 24 hrs CCl₄ treated rats. The normal value was 160.60 mg/100 ml for the Indian gerbil and 233.04 mg/100 ml for the House rat. After 24 hrs of CCl₄ treatment the level of cholesterol showed a decrease to about 69.73% of the normal value in the Indian gerbil and 97.01% in the House rat.

After 5 days of treatment not only the blood cholesterol level regained the normal value but it actually registered a rise to 120.97% of the normal value in the Indian gerbil and 152.44% in the House rat.

The liver cholesterol

The quantity of normal liver cholesterol was 452.68 mg/100 gm in the Indian gerbil and 937.57 mg/100 gm in the House rat. After 24 hrs of treatment, cholesterol showed an increase by 136.19% of the normal value in the Indian gerbil and 106.92% in the House rat. The rise was continued thereafter also and at the end of 120 hrs the increase registered was 287.87% of the normal value in the Indian gerbil and 171.52% in the House rat.
v) The blood phospholipid

In the Indian gerbil the normal level of blood phospholipid was 401.86 mg/100 ml. It increased to about 102.64% at the end of 24 hre CCl₄ treatment. Thereafter, the level came down much below the normal value i.e., 74.48% in 120 hre of CCl₄ treated rats.

In the House rat the blood phospholipid level of the normal animal was 220.33 mg/100 ml. In 24 hre treated rats the level came down to 96.18% of the normal value. Thereafter, also, it continued to show a further decrease and at the end of 120 hre the decrease was 87.50% of the normal value.

At the end of 24 hre, in the Indian gerbil the blood phospholipid level increased slightly. On the other hand in the House rat the blood phospholipid registered a slight decrease. Thereafter, also, the level of phospholipid continued to decline up to 120 hre of the treatment.

vi) The liver phospholipid

The level of liver phospholipid showed a rise at the end of 24 hre in both the species, the normal
reading being 4835.85 mg/100 gm in the Indian gerbil and 2853.72 mg/100 gm in the House rat. The increase was hardly 100.42% of the normal value in the Indian gerbil and 124.50% in the House rat. In the Indian gerbil the liver phospholipid continued to start rising and was 112.42% of the normal level at the end of 120 hrs. In the House rat on the other hand a decline was observed in the level of this constituent and became 73.94% of the normal value.

vii Total plasma proteins

The total plasma protein content of the normal animal was 6.21 gm/100 ml in the Indian gerbil and 6.84 gm/100 ml in the House rat. At the end of 24 hrs after treatment the protein content was reduced by 10-15% in these animals. Therefore, the total protein content started showing a rise and by 120 hrs CCl₄ treatment the level rose to about 95.71% of the normal value in the Indian gerbil, while in the House rat, it declined to 75.73% of the normal value.
The plasma albumin contents in the normal Indian gerbil was 3.85 g/100 ml and in the House rat this figure was 4.28 g/100 ml. The quantity showed a slight decrease at the end of 24 hrs in CCl₄ treated rats by about 13-17% and thereafter an increase was registered up to the end of 120 hrs. This increase brought the plasma level to 94.04% of the normal value in the Indian gerbil and 87.14% in the House rat.

The plasma globulin value was 2.35 g/100 ml in the normal Indian gerbil and 2.55 g/100 ml in the normal House rat. At the end of 24 hrs treated rats a steep decrease was observed in the Indian gerbil to about 79.50% of the normal value. The decrease was slight in the House rat and was 92.15% of the normal level. 120 hrs after the treatment the level had increased to 102.97% of the normal value in the Indian gerbil. In the House rat this globulin content continued to show a decrease to become 88.03% of the normal value at the end of this period.
Albumin/Globulin ratio (A/G ratio)

In the Indian gerbil the normal A/G ratio was 1.79 gm/100 ml. 24 hrs after the CCl₄ treatment it increased to about 110.05% of the normal value. Thereafter some decrease was noticed at the end of 120 hrs and the ratio came down below the normal value and it became 83.79% of the normal value.

The normal value of A/G ratio was 1.80 gm/100 ml in the House rat in 24 hrs CCl₄ treated rats, the ratio registered to 95.00% of the normal value. However, unlike in the Indian gerbil the ratio not only regained the normal value but it actually registered an increase to 155.95% of the normal value.