GENERAL SUMMARY
CHAPTER - II

The effect of a) 10 mg. of 3-methylcholanthrene in 2.0 ml. castor oil (MC) b) 10 mg. of 3-methylcholanthrene and 200 mg. of ascorbic acid in 2.0 ml. castor oil (MC + AA) c) 2.0 ml. of castor oil (CO) and d) 200 mg. of ascorbic acid (AA) on tissue concentration of ascorbic acid was studied, and compared with the values of control animals.

No changes were observed in the adrenal ascorbic acid content in any of the groups. The blood ascorbic acid content did not differ significantly from the control value in the MC, MC + AA and CO groups, but was raised about 22 - fold in the animals receiving ascorbic acid alone.

Marked changes were observed in the urinary excretion of ascorbic acid. The MC group exhibited a five fold increase in the urinary ascorbic acid value by the eighth day. This peak value was reached earlier in the MC + AA group and the increased ascorbic acid excretion was sustained over a longer period of time in this group. The AA group excreted most of the acid by the second day.

The ascorbic acid content of liver in the control group was 18.17 ± 2.85 mg./100 gm. of tissue
and was increased to 37.21 ± 6.90 mg./100 gm. of tissue in the AA group. The level fell sharply in the MC, MC + AA and CO groups of animals, but the level in the MC and MC + AA animals was significantly lower than in the CO group. No significant differences in hepatic ascorbic acid concentration were observed between the MC and the MC + AA treated groups.

CHAPTER III

The glucose-6-phosphatase activities in the liver was studied in rats receiving i) 10 mg. of 3-methylcholanthrene in 2.0 ml. of castor oil ii) 10 mg. of 3-methylcholanthrene and 200 mg. of ascorbic acid in 2.0 ml. castor oil iii) 2.0 ml. of castor oil and iv) 200 mg. of ascorbic acid. The protein content per 100 mg. weight of liver tissue was also measured. The glucose-6-phosphatase activities in the various groups of animals was found not to differ significantly from the control values. The protein content per 100 mg. of liver tissue was also found not to differ significantly from the control value of 19.87 ± 1.64 mg. in the different groups.
CHAPTER IV

The liver glycogen content was measured in groups of rats receiving i) 10 mg. of 3-methylcholanthrene in 2.0 ml. castor oil ii) 10 mg. of 3-methylcholanthrene and 200 mg. of ascorbic acid in 2.0 ml. castor oil and iii) 2.0 ml. castor oil intraperitoneally. A fourth group of animals received 200 mg. of ascorbic acid intramuscularly.

The liver glycogen was observed to fall significantly from the control levels in rats treated with 3-methylcholanthrene. No changes were observed in the glycogen content of the other groups. It was suggested that the loss of glycogen occurring after administration of 3-methylcholanthrene is blocked by concurrent administration of ascorbic acid.

The data tend to support the hypothesis that 3-methylcholanthrene increases ascorbic acid synthesis by increasing the rate of glycogenolysis.

CHAPTER V

The free amino acid pattern was studied in the serum of groups of rats receiving intraperitoneal injections of 2.0 ml. castor oil, 10 mg. of 3-methyl-
cholanthe in 2.0 ml. castor oil, and 10 mg. of 3-methylcholanthe with 200 mg. of ascorbic acid in 2.0 ml. castor oil. A fourth group of animals received 200 mg. of ascorbic acid intramuscularly.

Significant changes in free leucine and proline was observed in the animals treated with ascorbic acid. None of the other amino acids was significantly elevated above the control values, though a rise in the mean values was recorded for all the amino acids except phenylalanine.

The animals which received 3-methylcholanthrene alone showed an elevation of all the free amino acids above the control values. The rise was highly significant in the case of alanine and glycine.

The data obtained in the study indicate that 3-methylcholanthrene may act on ascorbic acid synthesis by releasing the glucose required through increased gluconogenesis, the enhanced gluconogenesis resulting from elevated levels of serum free amino acids.
CHAPTER VI

The hypothesis of antimalignancy activities of ascorbic acid has been examined by estimating the total blood ascorbic acid and total urinary excretion of ascorbic acid in 24 hours in groups of healthy adults and 47 cases of nasopharyngeal carcinoma both before and after treatment. The group of patients receiving treatment were sub-grouped into a) treated with deep radiation therapy and b) treated with endoxan.

The mean values of total ascorbic acid in blood and in urine in the normal group were 0.906 ± 0.296 mg.% and 40.19 ± 21.8 mg./24 hours respectively; in the group of patients the mean values blood ascorbic acid level and the urinary excretion of ascorbic acid before treatment were 0.903 ± 0.310 mg.% and 30.48 ± 14.8 mg./24 hours respectively and 0.780 ± 0.33 mg.% and 28.21 ± 16.6 mg./24 hours in the group of patients after treatment.

The mean values of total blood ascorbic acid in the patients treated with deep radiation therapy and endoxan were 1.03 ± 0.32 mg.% and 1.12 ± 0.21 mg.% respectively.
No statistically significant differences in the mean values of total blood ascorbic acid and 24 hour urinary excretion of ascorbic acid were observed between the groups of patients and the healthy group, but hypoascorbaemia in many cases and scurvy in one case were noted in the group of patients suffering from mesopharyngeal carcinoma.

CHAPTER VII

The free amino acid nitrogen content of blood was studied in 1) normal healthy individuals and 2) patients suffering from mesopharyngeal carcinoma, both before and after treatment. The amino acid nitrogen levels in the blood of the patients was raised significantly above the value observed for normal individuals ($P < .005$). The levels in the patients after treatment were not altered from the pre-treatment values, and there was no difference observed between the patients treated with deep radiation therapy and those treated with endoxan. The difference observed in the mean value of amino acid nitrogen between the control group and the treated patients was observed to be highly significant.
The free amino acid pattern of serum was studied in i) normal healthy individuals and ii) in mesopharyngeal cancer patients before any treatment was started and again after completion of treatment. The concentration of all the serum free amino acids studied, except for lysine and histidine, showed considerable decreases from control levels in the patients before treatment. The fall was most significant \( P < 0.005 \) for proline, alanine and glutamine. No further changes were noted after completion of treatment by deep X-irradiation, except in the case of proline, lysine and histidine, where the levels were observed to fall further.