Liver damage was produced in rats by injection of CCl₄. With the change from an acute parenchymatous lesion of the liver to a chronic lesion and cirrhosis, changes take place in the activity of various serum enzymes. Activity of transferases drops (alanine aminotransferase more rapidly than aspartate aminotransferase), activity of sorbitol dehydrogenase falls sharply, that of ornithine carbamoyltransferase falls slowly, and activity of alcohol dehydrogenase rises. The activity of all these enzymes in the liver falls.

The character of changes in serum enzyme activity and the diagnostic importance of its determination in chronic forms of hepatitis and cirrhosis have not yet been adequately studied.

In this investigation we studied the principles governing changes in activity of various serum enzymes during the change from an acute to a chronic lesion and during development of cirrhosis of the liver.

**EXPERIMENTAL METHOD**

Experiments were carried out on 260 male albino rats weighing 250-300 g. Liver damage was produced by subcutaneous injection of carbon tetrachloride in a dose of 0.5 ml/100 g body weight in an equal volume of sunflower oil. Administration of CCl₄ to all animals began at the same time and the compound was injected every 3 days for 2.5 months, the animals then being sacrificed at various times after the first

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Fig. 2. Connective-tissue bands in liver tissue with small, newly formed blood vessels and inflammatory infiltration in these bands. Marked parenchymatous degeneration. Fatty infiltration and disappearance of cytoplasm of nearby liver cells. Solitary binuclear cells can be seen. 24th day. Hematoxylin-eosin, 200 x.

Fig. 3. Extensive connective-tissue fibrous band with subsiding inflammatory changes in it and fatty infiltration of surrounding liver tissue. 78th day. Hematoxylin-eosin, 200 x.

injection (4, 8, 12, etc. up to 80 days). Animals of the control group were sacrificed along with the experimental animals.

Alcohol dehydrogenase activity was determined by the method of Roger and co-workers [3] and that of the other enzymes by methods described in previous papers [1, 2]. Activity of sorbitol dehydrogenase and aminotransferases was expressed in μ moles, that of ornithine carbamoyltransferase in μ g substrate/ml serum or g liver/h at 37°, and activity of alcohol dehydrogenase as the change in optical density readings after 10 min.

EXPERIMENTAL RESULTS

By injecting CCl₄ into rats at different times it was possible to examine the change from acute into chronic degeneration and the development of cirrhosis of the liver, in four main stages. Stages I and II (4-16 days from the beginning of CCl₄ administration) were characterized by the development of acute