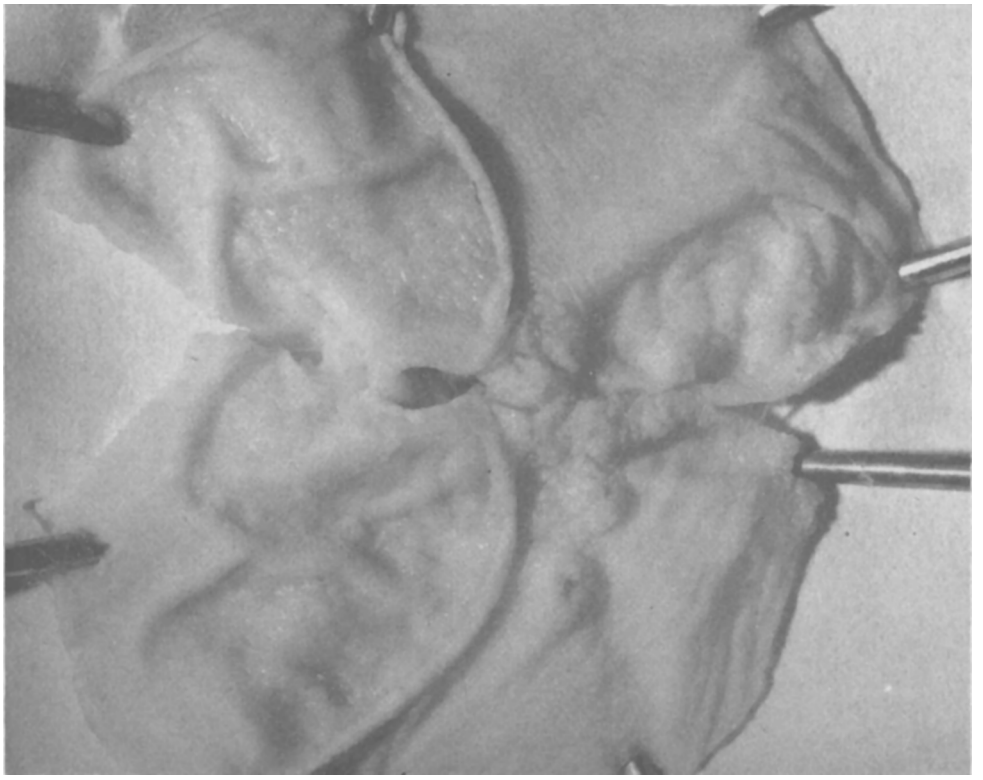

FIG. 4. Ulcers in forestomach of rat on torula diet.

started at the 25th day. Five mg % vit. E prevented the defect completely.

Necrosis of the liver developed very suddenly after an experimental period of 22 to 83 days and was accompanied by kidney lesions, forestomach ulcers, acute lung edema and hemorrhages in the lungs, in the lymphatic tissues and occasionally in the intestine.

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In Vitro Effect of Ethyl Alcohol on Respiration of Rat Liver and Kidney Slices.* (18936)

ELIZABETH FONDAL† AND CHARLES D. KOCHAKIAN.‡

From the Department of Physiology and Vital Economics, School of Medicine and Dentistry, University of Rochester, Rochester, N. Y.

In studies (unpublished) on the *in vitro* effect of testosterone on tissue respiration, ethyl alcohol was used as the solvent for the

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† Present address: Paris, France.

‡ Present address: Oklahoma Medical Research Inst., Oklahoma City, Okla.

androgen. It seemed important, therefore, to determine the influence of various concentrations of alcohol on the *in vitro* respiration of liver and kidney slices.

Procedure. The oxygen consumption of liver and kidney slices from adult male rats from our colony was measured at 37.5° by the Warburg technic with Summersen flasks and manometers. The tissues were sliced with a Stadie-Riggs microtome(1), weighed on a Roller-Smith Torsion balance and transferred to the respirometer flasks containing Ringer's solution buffered to pH 7.4 with N/150 phosphate(2). The center well contained 0.2 ml of 5% potassium hydroxide and a cylinder of filter paper. The alcohol was added just prior to the attachment of the flasks to the manometers. The system was oxygenated for 15 minutes, equilibrated for another 15 minutes and then readings made at 20-minute intervals for the first hour and at 30 minutes for the next hour. The tissues were removed at the end of the experiment by filtration on glass cloth rinsed with distilled water, dried at 95 to 100°C on tared discs of aluminum foil, weighed and analysed for nitrogen by the micro-Kjeldahl procedure. Calculations were made on the basis of both dry weight and milligrams of nitrogen. Since the results by the two procedures were comparable, only the Q_{O_2} values are presented.

Results. An increase in oxygen consumption of both liver and kidney slices was produced by the addition of alcohol (Fig. 1). The maximal increase occurred at an alcohol concentration of about 100 micromolar (about 0.5% w/v). Then, the oxygen consumption rapidly and progressively decreased to half its value at an alcohol concentration of approximately 1000 micromolar. The depressing effect of alcohol on respiration occurs more quickly and seems to be slightly greater for liver than kidney slices.

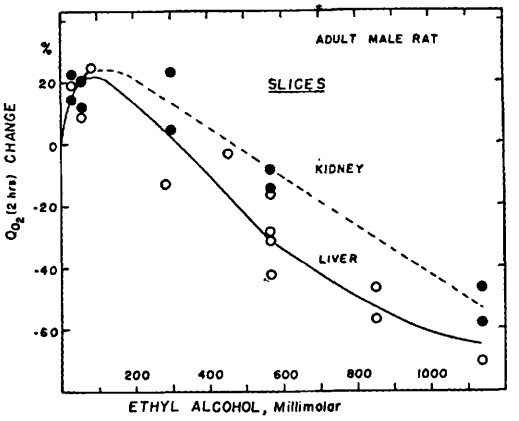

FIG. 1. Change in oxygen consumption of adult male rat tissues by various concentrations of ethyl alcohol.

Discussion. These results emphasize the importance and necessity of consideration of the concentration of alcohol in determining its influence on intermediary metabolic reactions.

Brain slices(3,4) also respond to the addition of ethyl alcohol in a manner similar to that of liver and kidney slices. The initial increase, however, is much smaller. This difference may be due to the fact that sufficiently small concentrations of alcohol were not used in the brain studies. The depressing effect of alcohol on brain tissues(4) was comparable to that obtained with kidney slices.

Summary. The addition of ethyl alcohol to liver and kidney slices from adult male rats produces a stimulation in oxygen consumption followed by a progressive inhibition as the concentration of the ethyl alcohol is increased.

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