the amplitude and radius of which vary in accordance with a harmonic rule with decay time determined by the value of the coefficieint of viscosity.

The absence of a wave indicates a high degree of viscosity of the tissues forming the test object. Asymmetry of the ring structures in turn reflects the difference (in this case, of 1.5 times) between the modulus of elasticity "along" the fibers of the tissues, and "across" them.

This account of the results of the preliminary stage of these investigations of the biochemical parameters of human muscle tissues by methods of nondestructive monitoring of changes taking place in them during the development of tension in response to work done in health and disease, it must be pointed out that the suggested method can also be used to determine and investigate nonhomogeneities in any viscoelastic material.

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AN OCULAR STEREOMETRIC GRID FOR INVESTIGATION OF THE LIVER

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The study of pathological changes in the hepatic lobule demands great precision in the evaluation of microcirculatory disorders and changes in the ratio between unchanged hepatocytes and cells in various states of degeneration. Stereometric grids and methods of investigation of liver sections have been described in the literature [1, 2].

However, the known methods do not provide results with the required accuracy, for they do not take account of differences in the morphological and functional structure of peripheral and central zones of the hepatic lobule and, in particular, the mutual arrangement of the hepatic artery, portal vein, and biliary and lymphatic capillaries, and the radial arrangement of the trabeculae of the hepatocytes and of the sinusoids relative to the central vein and the microciruclation in the lobule. The aim can be achieved by measuring the relative volume of the hepatocytes and of components of the microcirculatory bed of the lobule by means of the proposed grid and method of its use [3].* The ocular sectorial grid is a circle divided into six equal sectors A, B, C, D, E, and F. Each sector contains 55 dots arranged on 10 circumferences. The distance between neighboring dots on each circumference is equal to the distance between the neighboring circumferences. The circumference nearest the center of the grid has six dots, the next away from the center has 12 dots, and so on, up to 60 dots on the 10th circumference.

When histologic structures in the peripheral zones of the lobules are counted the center of the grid coincides with the center of the triad and the hepatic artery must be located in sector A. If the biliary capillary is on the right of the artery, the structures in

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the sectors are counted in the clockwise direction, but if the capillary is on the left, anticlockwise. The total number of dots coinciding with all structures of the portal canal must not exceed 33.

To determine the number of dots on the grid which coincide with structures in the central zone of the lobule, the center of the grid is made to coincide with the center of the central vein, and sector A must be directed toward the nearest triad. If the biliary capillary in the neighboring triad is located on the right of the hepatic artery, the sector by sector counting is undertaken in the clockwise direction, whereas if the capillary is on the left of the artery – anticlockwise. The quantitative results thus obtained are inscribed row by row in parts of a table drawn up beforehand for subsequent statistical analysis.

The sectorial anisotrophy of the structural elements and the proportion of degenerated hepatocytes containing glycogen, lipids, and succinate and lactate dehydrogenases can be determined by histotopographic investigation of zones of the hepati lobules. As an example, we give results of histometry of the liver from 14 healthy dogs of both sexes. Biopsy material was obtained, fixed, dehydrated, and embedded in paraffin wax, dewaxed sections were obtained, stained with hematoxylin and eosin, and embedded in polystyrene by the usual methods. The radius of the grid with a magnification of 400 was 100 μ, which in most cases is about half of the distance between the nearest portal canal and central vein. In this way it was possible to determine relative volumes of lobular histologic structures more accurately. The nucleo-cytoplasmic ratio in the zones of the lobules and sectors of those zones was determined by a simplified method by dividing the number of test dots which coincided with hepatocyte nuclei by the number of test dots which coincided with the cytoplasm of the liver cells. Under these circumstances the following results were obtained: 1) of 331 dots, taken a 100%, on average in the peripheral zone of the lobule four dots (1.2%) coincided with the hepatic artery, 14 (4.2%) with the portal vein, 21 (6.3%) with the portal canal, 199 (60.2%) with the cytoplasm of the hepatocytes, 47 (14.2%) with the nuclei of the liver cells, and 64 (19.3%) with the sinusoids. The nucleo-cytoplasmic ratio in this zone was 0.236; 2) of 331 dots, in the central zone on average eight (2.4%) coincided with the central vein, 207 dots (62.5%) coincided with the cytoplasm, 45 (13.6%) with the hepatocyte nuclei, and 71 (21.5%) with the sinusoids. Then nucleo-cytoplasmic ratio was rather less than in the peripheral zone, namely 0.217.

Thus with a somewhat smaller volume of its sinusoids the peripheral zone of the hepatic lobule under normal conditions is characterized by higher functional activity of its parenchyma than the central zone.

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