members of the Department of Neurology, Northwestern University Medical School, and to Dr. Minke of the Oak Forest Infirmary, for cooperation which made these studies possible.

5428

Staining Differences of Nuclei in Hepatic Cells.

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During a course of experiments with fixatives we observed an apparent differential staining of nuclei in liver cells. This was obtained after fixation of the tissue in a solution consisting of:

Potassium bichromate	2 gm.	Sulphuric acid (conc.)	1.75 cc.
Sodium sulphate	0.75 "	Acetic acid (conc.)	5 "
Mercuric sulphate	3.5 "	Distilled water	87 "

Liver tissue from the rabbit, cat, and dog was fixed for about 20 hours, after which it was dehydrated, imbedded in paraffin, and cut into 10μ and 5μ sections. Some sections were stained with Mallory's triple connective tissue stain while others were stained in hematoxylin and eosin.*

Observations. 1. Some nuclei of mononuclear liver cells appear blue, while others appear red. 2. Both nuclei in some binucleate liver cells appear blue, while in other cells both appear red. 3. In some binucleate liver cells one nucleus appears blue, the other red. 4. In the blue staining nuclei the nucleoli, which may be two in number, stain blue. 5. In the red staining nuclei, the nucleoli are as a rule red, but additional blue nucleoli may be present. 6. The nuclear ground-substance (enchylema) and the nuclear sponge-work stain red in the red nuclei and blue in the blue ones. 7. No apparent difference in the staining affinity of the cytoplasm of the cell body proper has been observed.

Schäfer,[1] Jordan,[2] and Bloom[3] do not describe any differences in

* Blue indicates affinity for aniline blue in Mallory's stain or hematoxylin in the hematoxylin and eosin stain; red indicates affinity for acid-fuchsin in Mallory's stain or eosin in the hematoxylin-eosin stain.

[1] Schäfer, E. A., Quain's Anatomy, 1912, **2**, 1. Longman, Green and Co., London.

[2] Jordan, E. H., A Text-book of Histology, 1930. W. B. Saunders Co., Philadelphia.

[3] Bloom, W., In Maximow and Bloom, A Text-book of Histology, 1930. W. B. Saunders Co., Philadelphia.

the staining of nuclei in liver cells. The latter author comments that in view of the numerous functions which the liver cells perform it is quite striking that there should be such a marked similarity in appearance in all the liver cells. Wilson[4] states regarding nuclei in general: "The nuclear framework undergoes great changes of staining-capacity in different phases of the cell-cycle and may even completely lose its affinity for the basic dyes, becoming purely oxyphilic like linin or general cytoplasm." He suggests further that the differences in the affinity of the nuclear framework may be interpreted as . . . "but passing phases, more or less marked and enduring, of one fundamental substance." A somewhat similar explanation is offered by him in regard to nucleolar affinities. This may lead to the view that the differences in the nuclear affinities observed in the liver cells are due either to their varying physiological state in life or to the particular fixative employed.

5429

Determination of the Amount of Blood in the Central Nervous System Following Injections of Hypertonic Solutions.

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The theory that the volume of blood and the volume of fluid within the cranium are inversely related to each other (Monro-Kellie-Burrows) has never been subjected to the test of the direct determination of the amount of blood in the central nervous system following dehydration after injections of hypertonic solutions. Wolff and Forbes[1] noticed contraction of the pial blood-vessels under such experimental conditions, while contrary to their observation Kubie and Hetler[2] described an increase in the color intensity of the brain cortex in color photographs taken before and after injections of 20-30% sodium chloride solutions.

Based on the observations of Voigt[3] that blood, brain and spinal cord do not retain colloidal silver but are free of silver 4 hours after the injection of collargol, the following method was applied for the

[4] Wilson, E. B., The Cell in Development and Heredity, 1925, 85. The Macmillan Company, New York.

[1] Wolff, H. G., and Forbes, H. S., *Arch. Neurol. and Psych.*, 1928, **20**, 73, 1035.

[2] Kubie, L. S., and Hetler, D. M., *Arch. Neurol. and Psych.*, 1928, **20**, 749.

[3] Voigt, J., *Biochem. Z.*, 1914, **63**, 409.