

The fact that limitation of protein prevents the development of Eclampsia in many cases and, furthermore, that a method of starvation and intestinal elimination gives the best results in curing the condition suggests strongly that substances which may be toxic to the pregnant woman are absorbed from the intestinal tract.

In this report we are primarily concerned with the hepatic lesion of Eclampsia; but it may be noted briefly that some of the dogs had convulsions, tonic and clonic, and some became comatose. The development of these conditions depended on the dosage. Sections of the kidney in some animals showed lesions similar to those found in humans dying of Eclampsia.

Our findings, we believe, explain in a measure why the hepatic lesion in Eclampsia can be averted by limiting the protein intake of the patient in the last months of pregnancy.

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Correlation between Threshold and Conduction Rate in Myelinated Nerves.

G. H. BISHOP AND PETER HEINBECKER.

From the Departments of Physiology and Surgery, Washington University School of Medicine, St. Louis.

In observing the effects of stimulating a nerve in the body, it is possible to lead off the cut end of the nerve into the oscillograph and thus correlate the potential form with the functional result of stimulation. Since the different fibers of a nerve are stimulated at different threshold strengths, if the difference in thresholds of different fibers were known, the oscillograph or other potential recorder could be dispensed with except for an occasional observation of threshold for the most irritable fibers, and the experimental procedure thus simplified. With this end in view, we have examined the ratios between the threshold of the first fibers stimulated in a nerve and that of other fibers, taking as criteria the thresholds of the first fibers in the various potential waves which represent fiber size groups. Gasser and Erlanger¹ have shown that the conduction rates of different fibers tend to vary as the fiber diameters, and by correlating the thresholds and conduction rates of different waves it should be possible to find the relationship between threshold and fiber size.

¹ Gasser, H. S., and Erlanger, J., *Am. J. Physiol.*, 1927, lxxx, 522.

For the potential waves of 4 bullfrog sciatic nerves, the averages of the ratios of the α/β and β/γ conduction rates are 1.64 and 1.60, respectively. The same ratios for similar nerves for which the data are obtained from the table in Gasser and Erlanger's² paper are 1.62 and 1.60. This is approximately the ratio of fiber diameters shown in Gasser and Erlanger's charts of size distribution. The γ/δ ratios of conduction rate for 2 nerves available are 1.45 and 1.40. The ratio of average thresholds for β/α for the first 4 nerves above is 1.63, but the γ/β ratio is 2.3. No data are available for δ . The threshold appears to increase faster than conduction rate decreases; the products of these, for the starts of the α and β waves, are equal, but for the γ wave this product is 30% higher. The variations between individual nerves are within 10% of these averages.

For one vagus nerve of a cat, 425 fibers of which have been counted,* including the larger ones, the ratios for both conduction rate and largest fiber size for the starts of the first 3 main groups are about 1.6, but the thresholds increase more rapidly than the rates decrease, the product of threshold \times conduction rate increasing progressively for the 9 potential waves distinguishable in this nerve. The products of threshold \times rate, increase in general for both vagus and sympathetic cat nerves as the conduction rate decreases in groups of fibers of successively smaller diameter. The sympathetic is very similar to the vagus in its potential form, except that it lacks the first 2 groups of large fibers prominent in the vagus. The last 2 waves of each nerve are presumably not due to myelinated axons. The threshold of the last wave of the vagus may be 100 times that of the first. The potential waves of these nerves often appear in pairs, that is, pairs of thresholds are close together, each pair occupying about the interval of one wave in the frog sciatic. This phenomenon is similar to the frequent doubling of the β and γ of the bullfrog sciatic, which is often noticeable in nerves which have been depressed in function and whose waves, therefore, separate out because of slowed conduction.

The product of threshold \times rate appears to be fairly constant for a given fiber of a nerve even with considerable depression of function, as on standing in Ringer's solution, but changes with anoxemia. It is susceptible to change with change of temperature, rising with increase. This presumably indicates that the threshold decreases proportionately less than the rate increases. The higher product, for small fibers observed, as compared with that for large, which

² Erlanger, J., and Gasser, H. S., *Am. J. Physiol.*, 1924, lxx, 624.

* We wish to extend our thanks to Dr. Cowdry for excellent sections of nerves made in the Cytological laboratory of the Department of Anatomy.

probably indicates that the threshold increases more than proportionately to $1/d$ diameter, may be correlated with the fact that, in the vagus measured, the myelin sheath is relatively thicker, in terms of percentage of total diameter, in the smaller fibers, thus offering relatively more resistance to a stimulating current. This is not inconsistent with the report of Donaldson and Hoke³ that the axon occupies one half the total cross sectional area in different animals, our figures for the sizes of fibers which Donaldson and Hoke usually measured being 54% and 46% (for 15 and 10 μ fibers) compared with their 50% average.

Qualitatively, threshold may be taken as a satisfactory criterion of which axon group is being stimulated, after a given nerve has been mapped out by means of the oscillograph, but only if the state of the nerve being stimulated is kept fairly constant, with occasional checking against the oscillograph potential record resulting from a given stimulus strength.

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Blood Pressure in Unanesthetized Animals Affected by "Vasopressin," Oxytocin," Pituitary Extract and Other Drugs.

CHARLES M. GRUBER.

From the Department of Pharmacology, Washington University School of Medicine, St. Louis, Mo.

Recently Kamm, Aldrich, Grote, Rowe and Bugbee¹ separated from pituitary extracts what they believe to be nearly pure vasopressor and oxytocic hormones. These hormones recently were placed on the drug market under the names "Vasopressin" and "Oxytocin". Gargle, Gilligan and Blumgart,² Ward, Lyon and Bemis³ have studied the effect of vasopressin upon blood pressure with uncertain results. This work was undertaken to determine if vasopressin affects the blood pressure in unanesthetized experimental animals and if so in what way does it change it.

Dogs and cats were used. In cats the operative work was done under ether anesthesia and the animals were permitted to recover. In the unanesthetized dogs local 1% procain anesthesia was used.

³ Donaldson, H. H., and Hoke, G. W., *J. Comp. Neurol.*, 1905, xv, 1.

¹ Kamm, Aldrich, Grote, Rowe and Bugbee, *J. Am. Chem. Soc.*, 1928, 1, 573.

² Gargle, Gilligan and Blumgart, *New England J. Med.*, 1928, cxcviii, 169.

³ Ward, Lyon and Bemis, *Am. J. Obst. and Gynecol.*, 1928, xvi, 655.