417. EFFECT OF BLOCKING AGENTS ON BLOOD FLOW THROUGH THE MANDIBULAR ARTERY. J. Lester Matthews,* Jack G. Bishop, and Homer L. Dorman*. Baylor Univ. College of Dentistry, Dallas, Texas.

Blood flow through the mandibular artery has been measured in healthy dogs anesthetized with sodium pentobarbital. Flow was measured by utilization of a simplified electromagnetic blood flow meter which requires cannulation of the vessel. Simultaneous recordings of blood pressure were made with a statham strain gauge and brush amplifier. Peripheral resistance could therefore be calculated. Cardiovascular responses to standard doses of acetylcholine and epinephrine were observed in order to test the responsiveness of the vascular bed and at the same time provide a basis for evaluating the instrumentation used. The blocking agents, xylocaine and procaine, were applied to the exposed mandibular nerve near its entrance into the mandibular foramen. The response to the 2 drugs was similar, i.e. an increase in flow rapidly followed the nerve block. This effect was consistently demonstrated in all the animals used, and occurred equally well following section of the nerve. These data conform well with observations by Barcroft et al. (J. of Physiol., 132:16, 1956) on blood flow to the forearm following nerve block of the brachial plexus. These results indicate that mandibular block interrupts a vasoconstrictor pathway supplying the mandibular area.

418. PHYSICO-CHEMICAL INVESTIGATION IN SALT SOLUTION OF A URINARY MUCOPROTEIN WITH VIRUS INHIBITING ACTIVITY. Myles Maxfield. Med. Dept., Brookhaven Nat. Lab., Upton L. I., N. Y.

A urinary mucoprotein which reacts with influenza, mumps and Newcastle disease virus has been isolated by Tamm and Horsfall and shown by them to have a molecular weight approximately 7×10^6 and to consist of fibrous molecules of dimension ~100 x ~25000 A. A mucoprotein with similar biological activity and chemical analysis has been isolated by Di Ferrante from urine by precipitation with cetyltrimethylammonium bromide. This has been shown by Maxfield to have in distilled water a molecular weight of 1.5×10^6. By light scattering its molecular weight remains 1.5×10^6 in 0.03 M NaCl; its molecule is fibrous and more tightly coiled than in water. The intrinsic viscosity is much lower than in water even allowing for the electroviscous effect; the refractive index increment is 1.72×10^{-4}; the ultraviolet absorption spectrum remains unchanged with the major peak at 278 mμ and shoulders at 284 and 290 mμ; Beers law is obeyed. This solvent is poor, giving a negative interaction coefficient. Tactoids form after standing 1 month. No aggregation is discernible by light scattering in the course of 8 hr. In potassium phosphase buffer pH 6.8 = 0.045 aggregation is immediately detectable by light scattering and tactoids are visible in 3 hr. The Di Ferrante mucoprotein appears to be a fragment of the Tamm and Horsfall mucoprotein which is split both laterally and longitudinally but retains the original antiviral activity.

419. ACTION OF DRUGS ON LOBSTER CARDIAC GANGLION. Donald M. Maynard (intr. by R. W. Gerard). Mental Health Research Inst. and Dept. of Zoology, Univ. of Michigan, Ann Arbor.

The effects of selected drugs on the isolated cardiac ganglion of Homarus were examined. Both burst patterning changes and a two dimensional analysis of burst frequency and duration indicate that the response of the ganglion to individual drugs, let alone types, is specific. It is unlikely that these effects can be explained by assuming action on a single, common mechanism. Of those drugs tested, only acetylcholine (Ach), serotonin (5-HT), and lysergic acid (LSD-25) were clearly excitatory. Ach and 5-HT caused initial excitation, subsequent disruption of the burst, and eventually block of activity. LSD-25 prolonged burst frequency increased burst frequency and exaggerated slow potentials. Other drugs were probably depressant. All but dinitrophenol (DNP) depressed the burst frequency. Phenobarbital, cocaine, and strychnine prolonged repetitive discharges in the burst, exaggerated slow potentials, and eventually caused block. Pentobarbital selectively depressed the large neurons while initially prolonging the small neuron discharge, thus acting differently from the other barbiturate. Morphine differentially depressed both neuron types. Gamma aminobutyric acid (GABA) decreased burst frequency and duration, but burst patterning suggested some synaptic potentiation. This action is very similar to that caused by stimulation of the extrinsic cardioinhibitory nerves. DNP was unique in its ability to destroy interaction between the ganglion units before blocking spontaneity. With the exception of DNP, Ach, and 5-HT, block of spontaneity occurred before disruption of the burst pattern. This suggests a stable morphological basis of interaction.

420. ANALOG STUDY OF NEURON IN VOLUME CONDUCTOR. A. J. McAlister (intr. by J. Z. Hearon). Naval Med. Research Inst., Bethesda, Md.

A mathematical analysis is available for electronic conduction in an isopotential medium. It is of interest to see how accurately this analysis applies to a neuron in an infinite volume conductor of finite conductivity. A natural second step is to determine whether voltage transients in the volume conductor differ for the several electrical events which can occur at the nerve membrane, and whether they may be used to determine the specific electrical behavior of the neuron. A simple and reasonable direct resistance-capacitance analog of a neuron with dendrites was built and subjected to various electrical boundary conditions. It was found that the electronic results for isopotential external media apply to the infinite volume conductor problem with less than 5% error, for values of external volume resistivity commonly encountered. Also, results from the analog indicate that for the living cell; 1) transients recorded within the soma are not adequate to differentiate between regions of active and passive membrane conduction; 2) transients recorded externally, very near the membrane, are proportional to membrane current, and the sign of such an external transient indicates whether conduction is active or passive beneath the electrode; 3) the amplitude of an external transient depends upon the ratio of passive to active membrane area.