## 7451 P

### Acceleration of Blood Coagulation by Breathing Oxygen.

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While conducting experiments to determine the rate of elimination of nitrogen from the body, in which the subject, either dog or human, breathed oxygen (99.5%) at atmospheric pressure; it was noted that the velocity of coagulation of the blood was greatly accelerated. During these experiments we have found it almost impossible to draw blood samples with a syringe without the use of an anticoagulant when the subject has been breathing oxygen.

In experiments where the femoral artery and vein of anesthetized dogs were exposed so that blood samples could be drawn at definite intervals, severe hemorrhage from injury to the artery occasionally occurred. When the animal was breathing room air it was necessary to clamp off the artery to stop bleeding. However, if the animal had been breathing oxygen for 15 minutes or longer the vessel repaired itself by external clotting and no clamping was necessary.

Further studies on the control of hemorrhage by breathing oxygen are in progress.

## 7452 P

### Unidentified Gram Positive Bacillus Associated with Meningo-Encephalitis.

CASPAR G. BURN. (Introduced by Raymond Hussey.)

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An unidentified gram positive bacillus has been procured from the blood stream of 3 newborn infants that died, having lesions determined at necropsy to be meningo-encephalitis during the past year and a half at the New Haven Hospital. The organisms were obtained during the clinical course of the disease of 2 of the infants and in all 3 instances they were isolated from the heart blood at postmortem. In 2 of the infants a routine bacteriological study of the organs at necropsy showed them to be diffusely distributed

throughout the body. The organisms are pathogenic for rabbits, guinea pigs, mice and to a lesser degree young monkeys. They have an especial affinity for the tissues of the central nervous system.

The organisms are morphologically a small non-spore forming gram positive bacillus measuring 1 to 4 micron in length and 0.5 micron in breadth with an occasional tendency to form longer rods or filaments. They are usually arranged singly or in small clumps with some tendency to palisade formation. All strains are non-acid fast. The colony on a blood agar plate is round, moist, convex and semi-translucent. It is not quite as opaque or dense as colonies of *Streptococcus hemolyticus,* although it is necessary to make a very careful morphological study of the organism for they may very easily be mistaken for strains of hemolytic streptococci because of the colony appearance and their marked hemolytic properties on blood agar plates. Hemolysis occurs both on surface and deep pour blood agar plates, as well as a rapid hemolysis takes place in broth of both rabbit and human red blood corpuscles. The strains grow readily and rapidly in meat infusion broth without aid of further nutritive material. They ferment dextrose, maltose, salicin, dextrin, galactose, starch and rhamnose in 24 hours, while lactose and glycerin fermentation is delayed usually for 48 to 72 hours. Litmus milk is slowly acidified and decolorized, but is not coagulated. Gelatin is not liquefied. They are very sluggishly motile, but it is extremely difficult to differentiate true motility in all the cultures studied. It fails to form indol or reduce nitrates. All 3 strains are very hardy and survive in ordinary media for long periods of time without transfer.

Serological studies of the 3 organisms demonstrate that they are homogeneous strains. Because of their resemblance in morphological and cultural properties to *Bacterium mononcytogenes*[1] further work is now in progress for studying this relationship.

When young rabbits were inoculated intravenously with known quantities of this organism (1 cc. volume) the clinical course of the disease and the pathology varied with the number of bacilli inoculated. Six animals receiving 500 million to 1 billion bacilli per cc. died within 36 to 48 hours from an overwhelming infection. In 27 rabbits receiving 6000 to 30 million bacilli per cc. there were 17 that developed signs of central nervous system involvement and at postmortem showed an extensive meningo-encephalitis. The liver and spleen contained small foci of necrosis. Three of the remaining

[1] Murray, E. G. D., Webb, R. A., and Swann, M. B. R., *J. Path. and Bact.*, 1926, **29**, 407.

10 animals that survived showed evidence of meningitis when they were sacrificed.

The site of the inoculation of the organism into the rabbits determines the course of the disease process. If small quantities of organisms are inoculated into the cisterna, the rabbits died within 24 to 48 hours with an extensive meningo-encephalitis. On the other hand, intramuscular or intraperitoneal injections did not produce any apparent change, either clinically or anatomically.

Mice, guinea pigs and young monkeys were found to be susceptible to intravenous inoculation of the organisms.

In summary, there has been isolated from the blood stream of 3 newborn infants an unidentified gram positive bacillus that is found to be pathogenic for the usual laboratory animals and apparently has a predilection to localize in the central nervous system when given intravenously in small quantities.

## 7453 C

## Validity of Iodine and Copper Reduction Methods for Amylase.

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If a quantitative method for the determination of amylase be valid and practical, different samples of the substrate—soluble starch—must give similar and reproducible results.

In a previous paper[1] the Wohlgemuth and viscometric methods were investigated by comparing the amounts of enzyme required to produce a given result in different samples of soluble starch. Both of these methods measures the dextrinogenic constituent of amylase; the Wohlgemuth was found to be non-valid as a quantitative procedure, while the viscometric method seems to be valid if properly controlled. Thompson, McGarvey and Wies[2] have obtained good results with the viscometric method by mixing together different samples of soluble starch.

The purpose of the present paper is to investigate the iodine and copper reduction methods as indicated above; the latter method is for the measurement of the saccharogenic agent of the amylase complex.

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1 Chesley, L. C., *J. Biol. Chem.*, 1931, **92**, 171.

2 Thompson, W. A., McGarvey, S. M., and Wies, C. H., *J. Gen. Physiol.*, 1932, **16**, 229.