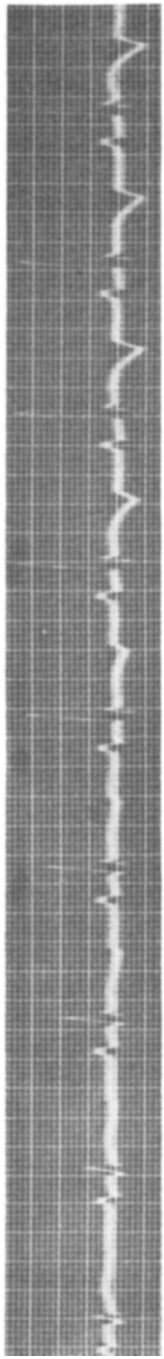

FIG. 1. Axial electrocardiogram. Time in 50th seconds. Effect of rotation of the heart upon the transverse axis of its base. With the diminution of the angle between the long axis of the heart (the electrical axis) and the plane of the Einthoven schema the voltage increases.

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Effect of Altering Position of the Heart on the Voltage of Electrocardiogram.

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Rotation of the heart of the dog *in situ* upon its longitudinal or antero-posterior axes alters the direction of the QRS complex of the electrocardiogram.[1] Altering the position of the heart in this manner or shifting the points of the leading about the heart as has been done by other investigators, however, maintains unchanged the relation of the heart to the plane which is defined by the points of the triangle from which the leads are taken.

Altering the long axis of the heart with reference to this plane ought to affect the voltage of the curve for the following reason: In the schema of Einthoven the heart is considered as a simple potential difference between 2 points. It is represented as the line between these points (the electrical axis). This line normally corresponds in an approximate manner to the long axis of the heart. The voltage of the electrocardiogram is recorded from the points of the Einthoven triangle, and is therefore proportional to the perpendicular projection of the line representing the electrical axis of the heart to the sides of the triangle (or to the relation between the absolute potential difference developed by the heart and the cosine of the angle between the direction in which the potential is developed and the line of lead). For similar reasons, if the heart is rotated in the plane perpendicular to that defined by the 3 points of the triangle, *i. e.*, on the transverse

[1] Meek, W. J., and Wilson, A., *Arch. Int. Med.*, 1925, xxxvi, 614.

axis of its base, the voltage registered by all 3 leads will diminish in proportion to the angle of inclination between the plane of the leads and the electrical axis. When they are parallel the voltage registered is maximum, and when they are perpendicular it is minimum, without regard to the relations already existing between them within the plane of the leading. Therefore a heart in which the electrical axis approaches the perpendicular to the plane of the 3 usual points of leading yet is otherwise perfectly normal will present very low voltage in all 3 leads. This can be illustrated by tilting the exposed heart in the dog while the electrocardiogram is written with the axial lead (Fig. 1). The presence of conditions such as this must be considered before assigning a value of significance to low voltage in the diagnosis or prognosis of heart disease.

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Aerobic and Anaerobic Examples of Hemolytic Bacterial Synergism.

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While studying the bacterial flora in the exudate in a case of chronic empyema of tuberculous origin 2 organisms were found which performed a function which neither could accomplish alone. One was a double-zoned *Staphylococcus aureus*. The other was a nonhemolytic diphtheroid bacillus.

On blood agar plates the colony of the double-zoned *Staphylococcus aureus* has a narrow zone of clear hemolysis about twice the diameter of the colony immediately around it and a wide zone of partial hemolysis about 8 times the diameter of the colony. Among the anaerobic bacteria this double zone is seen about certain strains of *C. welchii* while non-hemolytic strains of *C. welchii* have the outer zone only. The nature of these 2 changes in the hemoglobin is not fully understood.

While working with the culture from the pleural exudate it so happened that when the colonies were fished from the original blood agar culture to a fresh plate the diphtheroid bacillus and the double-zoned Staphylococcus were streaked side by side. After incubation, this plate showed that on the side toward the diphtheroid bacillus the outer zones of the Staphylococcus colonies were completely hemolyzed over an area very evidently under the influence of