Comparative Studies of Ventricular Vulnerability to Fibrillation. BERNARD LOWN, SAMI KAID BEY, MARK PERLROTH, AND TADAAKI ABE, Boston, Mass. (introduced by Frederick J. Stare).

Within each cardiac cycle, there is a period especially susceptible to ventricular fibrillation (VF). The present investigation demonstrates the occurrence and documents some properties of the vulnerable period in 5 mammalian species: rabbits, cats, dogs, sheep, and subhuman primates. The cardiac cycle was systematically explored at 10-msecond intervals with a capacitor discharge of 2.5 mseconds across the intact chest of anesthetized animals. In approximately 100 animals, more than 10,000 synchronized shocks failed to produce VF unless they fell just before the apex of the T wave of the surface electrocardiogram. VF was consistently produced in these 5 species when the ratio of Q shock/QT interval ranged from 0.65 to 0.80. The duration of the vulnerable period varied from 20 to 40 mseconds. In any one animal, the vulnerable period was the same whether this was determined transthoracically or from the surface of the heart, or measured from within the myocardium. The energy necessary to produce VF varied from 0.5 to 10 watt-seconds. For each species, there is an optimal energy level that consistently produces VF. The persistence of VF is related to heart weight. In dogs and sheep with hearts weighing over 50 g, the arrhythmia was permanent. In rabbits, cats, and Cebus monkeys with hearts weighing from 10 to 15 g, VF tended to be transient. These findings suggest that ventricular vulnerability is a physiologic property of the mammalian heart. The significance of these results to the occurrence of sudden death in man will be discussed.

Uric Acid Metabolism in Acute Intermittent Porphyria. GEORGE D. LUDWIG,* Philadelphia, Pa.

Although the precise biochemical lesion of acute intermittent porphyria remains obscure, impaired purine synthesis has been implicated. Aldrich and co-workers found decreased uric acid and increased porphyrin concentrations in allantoic fluids from chick embryos rendered porphyric by Sedormid injection, and postulated decreased utilization of delta-aminolevulinic acid (ALA) as a single carbon donor for purine synthesis, with resultant diversion of accumulated ALA to porphobilinogen (PBG) and porphyrins. Were reduced purine synthesis involved in human acute porphyria, low serum uric acid concentrations might be anticipated. In four patients in whom serial measurements were made during acute attacks, the serum urate concentration, which was normal at onset, fell significantly to as low as 1.0 mg per 100 ml. Greatly increased urinary urate excretion, however, with parallel increases in urate clearance and urate/creatinine clearance ratios invariably accompanied decreases in serum concentrations, which, with a slight lag, followed the pattern of the tubular urate reabsorption. Aminoaciduria coincided with peaks of urate excretion, and the excretory pattern of both correlated better with ALA excretion than with PBG or porphyrins, suggesting that this organic acid may alter renal handling of both amino acids and urate. Maximal urate and α-NH_2-nitrogen excretion coincided with maximal severity of the hyponatremic syndrome due to probable inappropriate secretion of antidiuretic hormone, which we have found almost invariably to accompany acute attacks of porphyria. The observation that ALA, or its methyl analogues, induces oliguria when injected into animals or man suggests that it may also be responsible for "triggering" this syndrome. Since dilutional effects of net water retention and renal loss fully account for the decreases in serum urate, the hypothesis that a block in uric acid production exists in the natural disease gains no support, and the rationale for the therapeutic use of adenine compounds is rendered questionable.

Staphylococcal Infections in Chick Embryos. WILLIAM R. MCCABE, Chicago, Ill. (introduced by Mark H. Lepper).

A previous report demonstrated the sensitivity of embryonated eggs to allantoic infection with pathogenic *Stapyhlococcus aureus* and described some aspects of this infection. The potential value of this model for the study of staphylococcal infections prompted extension of these studies and further investigation of its characteristics to define bacterial virulence factors and defense mechanisms. Coagulase-positive and -negative *Staphylococci* attained similar maximal population densities in allantoic fluid *in vivo,* and both invaded the amnion and embryo. Coagulase-positive strains produced striking inflammatory reaction and early abscess formation throughout the embryo, while coagulase-negative strains produced only minimal inflammatory reaction histologically. Virulence for chick embryos tended to reflect the pathogenicity in humans of the 87 strains studied. Coagulase-negative *Staphylococci* (30) were no more lethal than either sterile saline or broth with an inoculum of 10^3 to 10^4 bacteria. Coagulase-positive strains (27) isolated from the nares of healthy outpatients were more lethal ($p < .0.001$) than coagulase-negative strains and less lethal ($p < 0.01$) than coagulase-positive isolates (25) from definite human staphylococcal infections. Pathogenic *Staphylococci* produced fatality rates in excess of 50% after the injection of less than 100 bacteria. The fatality rates produced by individual strains were reproducible when repeated over a period of several months. The age of the embryo appreciably influenced the outcome of infections with both coagulase-negative and -positive strains. Specific factors responsible for lethality to embryonated eggs have not been identified. Gelatinase production, pigment, egg yolk factor, and the quantity and type of coagulase produced did not correlate with lethality. Although α-hemolysin production *in vivo* greatly exceeded that observed in broth culture, hemolysin production was not a prerequisite for lethality. Gamma globulin containing agglutinating antibody against the challenge organism afforded significant protection ($p < 0.001$), while gamma globulin without