pentobarbital sodium content of these samples showed essentially the same variations noted by Delmonico. Another group of dogs was given sodium amytal 50 mg. per kilogram and blood samples were taken at fifteen to twenty minute intervals after injection of the barbiturate. Analysis of the samples obtained yielded similar results. Delmonico determined the concentration of pentobarbital sodium in the efferent blood of the leg, kidney, liver and brain after injection of small quantities of pentobarbital sodium into the afferent blood vessels of these organs in intact dogs. In each he noted the same cyclic variation of the concentration of barbiturate in the blood. By making heart-lung preparations and perfusing isolated organs we hoped to determine whether this finding could be repeated. Two heart-lung preparations were set up. Fifty milligrams of pentobarbital sodium was injected into the venous side in each. Both exhibited the typical cyclic appearance and disappearance of the pentobarbital sodium in the samples collected from the arterial side. Two heart-lung hind leg preparations were made. One hundred milligrams of pentobarbital sodium was injected into the arterial supply to the leg in each. In each, typical curves were obtained. Two heart-lung kidney preparations were made. In one the kidneys were removed entirely before being perfused. In this experiment there was much loss of blood from the lungs and kidneys by capillary oozing. No urine was secreted. Fifty milligrams of pentobarbital sodium was injected into the arterial supply to the kidney, but none was obtained on analysis of the venous blood from the kidney except in two samples taken at eighty-one minutes and ninety-six minutes which showed 0.45 mg. per 10 cc. and 0.06 mg. per 10 cc., respectively. In the other preparation there was the usual cyclic appearance and disappearance of the pentobarbital sodium. One hundred milligrams of pentobarbital sodium had been injected. . . .

"These experiments apparently confirm Delmonico's observation on the cyclic variation of concentration of barbiturate in the blood of the intact dog and indicate that such a variation is produced by the isolated heart and lungs, legs and kidneys. The fact that these results were obtained repeatedly in several experimental setups and with two different analytic methods eliminates the possibility that this cyclic disappearance and reappearance in the blood of barbiturates injected intravenously is purely one of chance. No satisfactory explanation of this phenomenon can be offered." 5 references.

J. C. M. C.

LYFORD, JOHN, III; BERGER, OLIVE L., AND SHUMACKER, H. B., JR.: *An Analysis of Deaths in the Operating Rooms of the Johns Hopkins Hospital with Special Reference to those Occurring under General Anesthesia and Spinal Anesthesia.* Bull. Johns Hopkins Hosp. **70**: 488–503 (June) 1942.

"The authors reviewed the records of patients to whom 51,392 anesthetics, general and spinal, had been administered in the general operating rooms of the hospital for all types of surgical procedures, except obstetric and ophthalmologic, during the ten-year period from July 1, 1931 to July 1, 1941. The anesthetic agents were administered by a number of different anesthetists, and the operations were performed by a number of different surgeons. . . . A total of 75 deaths occurred in the operating rooms during the administration of the 51,392 anesthetics. As well as could be determined from a careful study of the records and from con-

sultation when possible with the operator, assistant, or anesthetist, 55 (73.3 per cent) of the 75 deaths were unrelated to the anesthesia, and 20 (26.7 per cent) seemed to be related to the anesthesia. . . . However, there was found no single causative factor for the deaths; and no death could be attributed exclusively to the anesthetic agent per se. Of the 20 deaths apparently related to the anesthesia, 9 seemed unavoidable, no adequate explanation having been found; 11 might possibly have been avoided. Of these 11 deaths, 4 resulted from obstruction of the main respiratory passages: one from edema of the larynx, and 3 from aspiration of gastric contents regurgitated during the administration of inhalation anesthetic agents to patients undergoing emergency operations and whose stomachs had not been emptied before the administration of the anesthetic. These deaths would suggest that greater care might be taken in preparing patients for emergency operations under general anesthesia. One death resulted from an explosion, the only explosion occurring in the hospital in 47 years, a period of time in which an estimated 200,000 inhalation anesthetic agents were administered. Three deaths related to the anesthesia appeared to have been associated with the technique of administration of an inhalation anesthetic agent. Three additional deaths were related to the administration of spinal anesthetic agents. The gross anesthetic mortality rate in the operating rooms was 0.039 per cent, and there were no statistically significant differences between the mortality rates with the various anesthetic agents. When the possibly avoidable deaths were excluded and only those were considered for which no adequate explanation could be found, there was an anesthetic mortality rate of 0.017 per cent." 21 references.

J. C. M. C.

EVANS, J. A.: *The Combined Use of Heparin and Dicoumarin (3.3' methylenebis, 4-hydroxycoumarin) in Thrombophlebitis and Pulmonary Embolism (Preliminary Report).* Lahey Clin. Bull. 2: 248–256 (Apr.) 1942.

"At the Lahey Clinic it has been customary to heparinize patients with phlebothrombosis even after vein ligation and section have been performed to prevent pulmonary embolism. . . . Since in many cases of phlegmasia alba dolens the thrombotic process may propagate itself into the pelvic veins or into the opposite leg, these cases too are safer if an anticoagulant is given even if paralumbar sympathetic injection with metycaine has greatly alleviated the condition. The expense involved and the great amount of work required of the nursing and intern staff, not to speak of the discomfort to the patient required by ten days to three weeks of continuous intravenous flow of heparin, have often discouraged its use where we felt it might be advantageous. An inexpensive, orally administered anticoagulant agent has been found in dicoumarin. . . .

"Heparin rapidly produces a prolonged coagulation time. Dicoumarin does so slowly with a latent period of from two to five days when given orally, depending on dosage and rate of absorption. . . . In our hands the greatest potential danger of dicoumarin lies in its accumulative action, probably due to slow individual absorption since evidence of prolonged action after discontinuing the drug does not exist in every case. Therefore, the patient should remain under observation until the prothrombin content of the blood is found to be returning toward normal. Transfusion offers almost immediate safety from dicoumarin bleeding by replacing absent prothrombin. It may be necessary to repeat the transfusion." 7 references.

J. C. M. C.