HYPOTHERMIA The temperatures of the right atrial blood, cerebral cortex, rectum, subcutaneous tissue, nasopharynx and lower one-third of the oesophagus were measured continuously in sheep during surface cooling. The blood was colder than the brain during cooling and warmer on rewarming. The lower one-third of the oesophagus, its coolest portion, did not differ in temperature from the cerebral cortex by more than 0.2 C. at any time. (*Hercus, V., Cohen, D., and Bowring, A. C.: Temperature Gradients During Hypothermia, Brit. M. J. 1: 1439 (June 6) 1959.*)

METHODS OF COOLING Hypothermia may be induced by extracorporeal cooling (either arteriovenous or venovenous) or surface cooling (immersion in water, use of cooling blankets, packing in ice or ice bags or irrigation of the pleural cavity with cold saline). Four problems arise in clinical hypothermia: (1) drift in body temperature; (2) myocardial irritability; (3) rewarming shock; (4) bleeding tendency. One of the best controls of drift in body temperature is experience with the method one uses. The more rapidly the patient cools, the further will be the drift, once active cooling is stopped. Infants have labile thermoregulating mechanisms and may cool rapidly. If a very heavy individual is cooling rapidly, considerable drift must be expected because of the large body mass. During active cooling esophageal temperature is 1 degree to 4 C. below rectal temperature. The temperature gradient is proportional to the rate of cooling. Reduction of this gradient when active cooling has ended signals that temperature drift is near an end. The desired temperature range is 28 C. to 31 C. After temperature is stabilized, esophageal temperature becomes higher than rectal temperature and remains so during rewarming. Cardiac irritability is increased as temperature falls below 30 C. A higher incidence of ventricular fibrillation which is more often irreversible occurs with the use of citrated rather than as with heparinized blood. The syndrome of rewarming shock is characterized by a progressive decline in blood pH to levels below 7.15. Ultimately an abrupt loss of consciousness occurs associated with respiratory inadequacy, and occasionally associated with a fall in blood pressure and tachycardia. Presumably, the metabolic acidosis is due to accumulation of metabolites caused by intense peripheral vasoconstriction. These are liberated upon vasodilatation during rewarming. Upon correction of the metabolic acidosis with sodium bicarbonate, the clinical recovery is usually dramatic. The use of largactil, phenergan, or ether prevents rewarming acidosis probably by maintaining peripheral circulation. The only consistent blood abnormality associated with generalized oozing is thrombocytopenia. Platelets are decreased an average of 43 per cent during hypothermia being sequestered principally in the portal system and return to normal on rewarming. Heparin, 15 to 20 mg., administered prior to cooling decreases the average platelet drop to 19 per cent. The patient is rewarmed in bed with a heat cradle, hot air and warm water bottles. Shivering is controlled with largactil. (*Bigelow, W. C.: Methods for Inducing Hypothermia and Rewarming, Ann. New York Acad Sc. 80: 522 (Sept. 14) 1959.*)

HYPOTHERMIA Trauma to dogs under ether anesthesia produces a marked increase in pituitary ACTH and adrenal cortical secretion. Induction of hypothermia greatly depresses the output of these hormones, while rewarming restores them. Cooling the adrenal gland either separately or together with the rest of the body causes a marked depression of adrenal sensitivity to exogenous ACTH. Adrenomedullary secretion is likewise reduced in dogs, but not in the one human tested at 30 C. The disappearance rate of exogenously administered hydrocortisone was slower in the hypothermic adrenalectomized animal than the normothermic dog. This may explain why in some studies peripheral corticosteroid levels did not fall with hypothermia. (*Hume, D. M., and Egdahl, R. H.: Effect of Hypothermia and of Cold Exposure on Adrenal Cortical and Medullary Secretion, Ann New York Acad. Sc. 80: 435 (Sept. 14) 1959.*)

RESPIRATION IN HYPOTHERMIA Hypothermia alters virtually every measurable phenomenon involved in respiratory gas trans-