

minutes after ventilation was stopped showed that some degree of respiratory acidosis occurred. This may be a factor in delayed death and in brain damage. (This investigation was supported by Research Grant H-5439 from the National Heart Institute, P.H.S.)

The Effects of an Atmosphere of Nitrous Oxide and Oxygen on the Incubating Chick. GEORGE H. M. RECTOR, M.D., and DOUGLAS W. EASTWOOD, M.D., *University of Virginia School of Medicine, Charlottesville, Virginia.* Nitrous oxide has been shown to inhibit cell growth or cause cell death in the bone marrow of intact animals (Green, C. D.: *ANESTHESIOLOGY* 24: 341, 1963) and to reduce the rate of mitosis in the myocardial myoblasts of the mouse embryo (Kieler, J.: *Acta Pharmacol. Toxicol.* 31: 301, 1957). Because of these effects, an experiment was designed to determine the effects of an atmosphere of nitrous oxide and oxygen on the incubating chick. *Method:* Two identical electric incubators enclosed separately in plastic containers were used. The same conditions of temperature, humidity, rate of gas flow and egg movements were maintained as far as possible. Eighty per cent nitrous oxide and 20 per cent oxygen was passed through one, and air through the other. Each atmosphere was checked frequently for concentrations of oxygen, carbon dioxide and nitrogen. Blood counts and gross pathologic examinations were performed on a portion of the hatched chicks. Some were allowed to mature. Eggs which did not hatch were opened, and the embryos examined. *Results:* Our experiment showed that 10 to 20 per cent of the incubating experimental eggs will hatch, although this occurs about 36 hours later than the controls. Sixty per cent or over of the controls will hatch. Fifty to 60 per cent of the experimental eggs will progress beyond 14 days but not to hatch, as compared to over 75 per cent of the control. Spastic paralysis, present in three of the 15 live experimental chicks, was not noted in the controls. The experimental chicks that appeared grossly normal ate, drank and developed normally. Some appeared sickly though having no obvious malformations and usually died in less than 24 hours. Both red blood cell counts and smears for leucocytes were normal in all specimens examined. An attempt was made

to design the experiment so that any adverse effect noted could be considered due to the absence of nitrogen or the presence of nitrous oxide. The oxygen was maintained at normal tensions and the carbon dioxide below 0.1 per cent to eliminate teratogenic and lethal effects of either a low oxygen tension or a high carbon dioxide tension. (Gallera, J.: *Acta Anat.* 11: 549, 1951; Romanoff, A.: *J. Morph. Physiol.* 50: 517, 1930). There is conflicting evidence on the effects of an atmosphere free of nitrogen on the chicken embryo. Volskii reported no development after five days (*Dokl. Akad. Nauk. SSSR.* 128: 895, 1960). Boriskin reported a 25 per cent hatchability in helium-oxygen mixtures (*Dokl. Akad. Nauk. SSSR.* 143: 457, 1962). (Supported by the American Medical Association-Education and Research Foundation Grants-in-Aid for Research Project, No. 170.)

Comparison of Effect of Norepinephrine and Angiotensin on Blood Volume and Viscosity. J. SHIBUYA, M.D., W. E. BAGEANT, M.D., P. GONZALEZ, M.D., F. H. SMALL, III, M.D., and S. N. ALBERT, M.D., *Anesthesiology Research Laboratory, Department of Anesthesiology, Washington Hospital Center, Washington, D. C.* Ample evidence supports the view that an independent volume receptor mechanism exists in the kidney, as well as a stretch mechanism, that functions by activation of the angiotensin system and production of angiotensin II (val angiotensin). Angiotensin II (Hypertensin-Ciba) is an octapeptide. It differs from sympathomimetic amines both chemically and pharmacologically and acts directly on smooth muscle and raises blood pressure by causing constriction of the precapillary sphincters (DePasquale, N. P., and Burch, G. E.: *Ann. Intern. Med.* 58: 278, 1963). Norepinephrine on the other hand, produces marked constriction of the capacitance vessels, and of both pre- and post-capillary sphincters (Burch, G. E., and DePasquale, N. P.: *Amer. Heart J.* 60: 915, 1960). The authors have conducted a comparative study on the effect of norepinephrine and angiotensin II on blood volume, blood viscosity, and rate of equilibration of labeled red cells with the circulating blood. *Method:* Fourteen unpremedicated patients undergoing minor surgery were studied. Five patients