tion, respiratory depression was somewhat less intense at both 20 minutes and 60 minutes than it was with phentanyl alone. *Conclusions:* These studies seem to corroborate earlier clinical impressions that phentanyl and the mixture of phentanyl and dehydrobenzperidol (Innovar) used in neuroleptanalgesia caused a degree of respiratory depression similar to that seen with morphine. However, the duration of this effect is shorter with the neuroleptanalgesic agents. In 5 volunteers the administration of morphine sulfate resulted in nausea and orthostatic hypotention. In 4, administration of the phentanyl-dehydrobenzperidol mixture resulted in a peculiar inability to concentrate, combined with restlessness and uneasiness, which in one case lasted approximately 12 hours.

Carcinostatic Action of Nitrous Oxide in Mice. B. RAYMOND FINK, *M.D., Department of Anesthesiology, University of Washington School of Medicine, Seattle, Washington.* Interference by nitrous oxide with myelopoiesis in human and rat bone marrow (Lassen, H. C. A., and others: Lancet *270:* 527, 1956; Green, C. D., and Eastwood, D. W.: ANESTHESIOLOGY *24:* 341, 1963) and in the chick embryo (Rector, G. H. M., and Eastwood, D. W.: ANESTHESIOLOGY *25:* 109, 1964) raises the question whether nitrous oxide can also inhibit the growth of cancer. An investigation was carried out on adult male BALB/c mice inoculated subcutaneously with isogenetic transplants of a methylcholanthrene-induced fibrosarcoma. *Method:* Litters were divided and transplants effected alternately in the two groups—a total of 20 mice in each of three experiments. One group was maintained continuously in an atmosphere of 75–80 per cent nitrous oxide in oxygen, with carbon dioxide absorption; the gas concentrations were checked several times daily. The other group, serving as controls, was maintained in a similar enclosure receiving an equal flow of air. The nitrous-oxide-treated mice appeared hyperactive for the first day or two, after which they became behaviorally indistinguishable from the controls. Both groups ate and drank throughout the experiments; however, the nitrous oxide group suffered an approximately 10 per cent loss in weight in the first week, part of which they subsequently recovered. In each of the experiments 70 or 80 per cent of the mice in both groups developed fibrosarcomas, eventually proven by histological examination (hemotoxylin-eosin stain) at autopsy. The size of the tumors was measured twice weekly, externally with calipers. At the end of three weeks the animals were killed. Direct measurements after autopsy confirmed the final transcutaneous measurements. *Results:* Sarcomas in the nitrous oxide group grew more slowly than in the controls. Comparing the smallest diameter of the tumors, in the nitrous oxide group this averaged 5.2 mm. $\pm$ 2.4, as against 11.0 mm. $\pm$ 2.6 in the control group. Red and white cell counts, as well as the hematocrit, were somewhat elevated in the former, suggestive of hemoconcentration. The principal increase in the white cells was among the polymorphonuclears. Partial inanition due to loss of appetite may have helped to slow the growth of the tumors in the nitrous oxide group, but in tissue culture experiments where this factor was excluded (Kenny, G. E., and Fink, B. R.: to be published) nitrous oxide definitely slowed the growth of a mouse fibroblast cell line. *Conclusion:* It is tentatively concluded that in BALB/c mice nitrous oxide exerts a retarding action on the growth of fibrosarcoma transplants. (Supported by the American Cancer Society.)

Electron Micromorphologic Response of the Dog Liver to Halogenated Anesthetics. A. H. GIESECKE, JR., M.D., J. R. CLARK, B. A., V. A. STEMBRIDGE, M.D., F. T. KALLUS, M.D., and M. T. JENKINS, M.D., *Departments of Anesthesiology and Pathology, The University of Texas, Southwestern Medical School, Dallas, Texas.* Hepatotoxicity of halogenated anesthetics has been a subject of long-standing controversy. Many authors have shown by various methods that degrees of hepatotoxicity from minimal to severe can be produced by some of these agents under certain conditions. Previous investigations (Cale, J. O., Parks, C. R., and Jenkins, M. T.: ANESTHESIOLOGY *23:* 248, 1962) failed to reveal histological evidence of hepatotoxicity following five hours of deep methoxyflurane anesthesia in 66 nutritionally normal dogs. Histologic evidence of severe hepatotoxicity could be demonstrated in

Downloaded from http://asa2.silverchair.com/anesthesiology/article-pdf/27/2/214/285043/0000542-196603000-00034.pdf by guest on 26 September 2023